Hornsea Project Four: Environmental Statement

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Volume A4, Annex 5.1: Impacts Register

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Hornsea 4

Ørsted

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Hornsea 4

1. Impacts Register Explained

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ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
Unique ID for each impact which can be used to refer between those impacts in the ES and those in the Impact Register.	Identifies that part of the Hornsea Four development where the impact is anticipated to arise.	Identifies the phase of the Hornsea Four development. I.e when the impact is anticipated to arise.	The impact and the activity that the impact arises from.	The Maximum Design Scenario (MDS) as defined by the technical consultant accounting for the Project Description at ES for the specific impact and activity.	The justification of why the MDS as defined is the MDS, providing reference to other developemnt scenarios or options.	Commitments that are relevant to reduce and/or eliminate Likely Significant Effects (LSE). Primary (Design) or Tertiary (Inherant) are commitments that are embedded within the assesment at the relevant point in the EIA (e.g. PEIR or ES). Secondary commitments ares incorportated to reduce LSE to acceotable levels following assessment.	Presents the findings of the EIA at Scoping. (See Table 1 for further details). The Scoping Report can be accessed using the link provided below in Table 1.	Identifies the approach taken to the Impact at PEIR. (See Table 2 for further details).	Details the justification for the projects appraoch taken to the Impact at PEIR.	Identifies the expected magnitude of the impact Cconsidered at PEIR, derived from topic-specific criteria. For definitions of impact Magnitude, refer to the respective topic ES Chapter, provided in Volume A3. Methodology is retained in ES Chapters for all impacts assessed at PEIR or ES. PEIR documents can be accessed using the link provided below in Table 2.	Identifies the sensitivity of the receptor considered at PEIR, derived from topic-specific criteria. For definitions of impact Sensitivity, refer to the respective topic ES Chapter, provided in Volume A3. Methodology is retained in ES Chapters for all impacts assessed at PEIR or ES. PEIR documents can be accessed using the link provided below in Table 2.	Presents the findings of the EIA at PEIR. PEIR documents can be accessed using the link provided below in Table 2.	Identifies the approach taken to the Impact within the ES. (See Table 3 for further details).	Details the justification for the projects appraoch taken to the Impact at PEIR.	Identifies the expected magnitude of the impact considered within the ES, derived from topic-specific criteria.	Identifies the sensitivity of the receptor considered within the ES, derived from topic-specific criteria.	Presents the findings of the EIA within the ES.
Example																
BIE-O-9	*All-Offshore*	*Operation*	*Colonisation of the WTGs and scour/ cable protection may affect benthic ecology and biodiversity.*	*Array Area: - Total area of introduced hard substrate = 3,795,504 m2 (calculated from total of cell above).*	*The maximum adverse scenario is defined by the maximum area of structures, scour protection, cable protection and cable crossings introduced to the water column, including surface area of vertical structures.*	*None*	***No likely significant effect***	***Simple Assessment***	*Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID:X).*	*Minor*	*Medium*	***No Significant Effect (Minor Adverse or Beneficial)***	***Simple Assessment***	*Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.*	*Minor*	*Medium*	***No significant effect (Slight adverse)***

Table 1. Key to Hornsea Four position at EIA Scoping

- Likely significant effect without secondary mitigation - Simple assessment
- Likely significant effect without secondary mitigation - Detailed assessment
- No likely significant effect identified at Scoping

Link to Hornsea Four EIA Scoping Report

Table 2. Key to Hornsea Four position at PEIR

- Potential impact is assessed at PEIR - Simple assessment
- Potential impact is assessed at PEIR - Detailed Assessment
- Not considered in detail in the PEIR, no likely significant effect at Scoping. Agreement not reached between Hornsea Four and the Planning Inspectorate at Scoping
- Scoped out as greement reached between Hornsea Four and the Planning Inspectorate at Scoping
- N/A or impact not identified at Scoping or PEIR and to be assessed within the ES

Link to Hornsea Four PEIR documents

Table 3. Key to Hornsea Four position at ES

- Potential Impact is assessed at ES - Simple Assessment
- Potential Impact is assessed at ES - Detailed Assessment
- Scoped out as agreement reached between Hornsea Four and the Planning Inspectorate at Scoping
- Impact not considered in detail in the ES. No likely significant effect at PEIR

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
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MP-C-1	All offshore	Construction	Seabed preparation activities. Seabed preparation activities (levelling, sandwave clearance, cable jointing pits, etc.) which may lead to a requirement for spoil disposal elsewhere creating elevated suspended sediment and potential smothering by deposition.	**Landfall area:** • Up to eight offshore HDD exit pits (noting up to three will be open at any time for a period of up to three months), each requiring excavation of 2,500 m^3 which will be side-cast onto the adjacent seabed. Backfilling of exit pits will recover a similar amount of material to be from the surrounding seabed, as required. **Offshore ECC:** • **Sandwave clearance -** Total sandwave clearance of 757,000 m^3 along a corridor of 99 km in length for six export cables. • **Cable jointing pits -** Up to four joints per export cable (maximum of 24 jointing pits for six export cables), each pit excavated to 5 m over an area of 3,500 m^2 and producing 17,500 m^3 of sediment for removal, a total of 420,000 m^3 for all pits, with a provision for 50% of losses to be made up. • **HVAC booster station foundations -** Seabed preparation for three six-legged Suction Bucket Jacket foundations requires removal of 171,735 m^3 for three HVAC booster station foundations. **Total spoil in offshore ECC area = 1,348,735 m^3** **Offshore array area:** • **Sandwave clearance -**Total sandwave clearance of 961,000 m^3 which includes 77,000 m^3 for 10 km of export cable within the offshore array area. • **180 WTG foundations -** Seabed preparation for WTG foundations requires removal of 1,045,221 m^3. • **Nine Offshore Substation (OSS) foundations -** Seabed preparation for six Suction Bucket Jacket (Small OSS) & three GBS (Large OSS) requires removal of 737,130 m^3 of spoil for nine OSS foundations. • **Offshore accommodation platform foundation -** Seabed preparation for Suction Bucket Jacket (Small OSS) requires removal of 57,245 m^3 of spoil for a single offshore accommodation platform foundation. **Total spoil in offshore array area = 2,800,596 m^3**	Seabed preparation (seabed levelling and sandwave clearance) assumes excavation using a trailer suction hopper dredger (TSHD) which collects a large volume of sediment and then releases this as spoil onto the seabed leading to the highest risk of smothering. These impact pathways are separated from seabed installation because they require disposal of spoil away from the point of excavation. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co44 Co45 Co201 Secondary: Co187 Co188 Co189	**Likely significant effect without secondary mitigation** Project description details to be developed post-Scoping.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Landfall works: Negligible Sandwave clearance and seabed levelling: Pathway	N/A	**Landfall works: No significant effect (not significant)** **Sandwave clearance and seabed levelling: Pathway**	**Detailed Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new detailed assessment, drawing on additional modelling.	Landfall works and sandwave clearance - Bridglington harbour, LSOs & HU015: Negligible Seabed levelling: Pathway	N/A	**Bridglington harbour, LSOs & HU015: No significant effect (not significant)** **Seabed levelling: Pathway**
MP-C-2	All offshore	Construction	Seabed installation activities. All direct sediment disturbance activities that may lead to locally raised suspended sediment concentrations at source (e.g. drilling, cable trenching, etc).	**Landfall area:** Depending on the configuration of the HDD Exit Pits, the use of cofferdams and the design of a drilling fluid management system there remains a residual risk for drilling muds (e.g. bentonite) to be discharged into the marine environment at break-out. The maximum estimated spill volume is 265 m^3 per HDD Exit Pit and a total of 2,120 m^3 (eight pits). **Offshore ECC:** • **Cable trenching -** Cable installation along a length of 109 km for up to six cables releasing 3,903,000 m^3 into suspension by a Controlled Flow Excavator (CFE). Values include the 10 km of export cable falling within offshore array area. Total duration of 24 months with a maximum trenching rate of 300 m/hr in soft soils. • **HVAC booster station foundations -** Drilling for Piled Jacket (Small OSS) foundation option, releasing 4,618 m^3 for three foundations, representing 10% (of depth). **Offshore array area:** • **Cable trenching -** Cable installation along a length of 600 km for array cables and 90 km for interconnector cables releasing 4,140,000 m^3 into suspension by CFE. • Fastest excavation rate of 300 m/hr in soft soils. Single trenching vessel assumed for a sequential activity. • **Drilling of WTG foundations -** Drilling for monopile foundation option, 127,235 m^3 for 18 foundations, representing 10% (of all WTGs). Drilling activity considered to be sequential between sites. • **Drilling of nine OSS foundations -** Drilling for six Piled Jacket (Small OSS) & three Piled Jacket (Large OSS), 13,854 m^3 for nine foundations, representing 10% (of depth). • Drilling activity considered to be sequential between sites. • **Drilling of offshore accommodation platform foundation -** Drilling for Piled Jacket (Small OSS), 1,540 m^3 for one foundation, representing 10% (of depth). **Total drill cutting arisings in offshore array area = 142,629 m^3**	All direct sediment disturbance activities that may lead to locally raised suspended sediment concentrations at source (e.g. drilling, cable trenching, etc). Largest disturbed volume and highest trenching rate produces the greatest rate of sediment release at source. CFE is selected as the MDS option for trenching due to similarities with jetting releasing sediments into the water column, but involving larger volumes of sediment. For drilling, the greatest amount of arisings represents the MDS irrespective of the foundation type. These impact pathways are separated from seabed levelling and sandwave clearance because they occur at source. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co44 Co45 Co201 Secondary: Co187 Co188	**Likely significant effect without secondary mitigation** Project description details to be developed for excavation quantities and construction rates. Sediment material is likely to fall out of suspension relatively quickly.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Landfall works and cable trenching in ECC: Negligible Foundation drilling and cable trenching in array: Pathway	N/A	**Landfall works: No significant effect (negligible adverse)** **Foundation drilling and cable trenching in array: Pathway**	**Detailed Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new detailed assessment, drawing on additional modelling.	Cable trenching in ECC - Bridglington harbour: Minor Foundation drilling and cable trenching in array: Pathway	Cable trenching in ECC - Bridglington harbour: Medium Foundation drilling and cable trenching in array: Pathway	**Cable trenching in ECC - Bridglington harbour: No significant effect (slight)** **Foundation drilling and cable trenching in array: Pathway**
MP-C-3	All offshore	Construction	Scouring around foundations	**Offshore ECC:** • HVAC booster station foundations - Risk for scouring in pre-scour protection period around three 75 m wide GBS (Box-type) foundations. A minimum separation distance between foundations of 100 m may lead to group scour between adjacent structures for any areas without scour protection. **Offshore array area:** • 180 WTG foundations - up to 110 GBS foundations. • Nine OSS foundations - Three 150 m wide GBS (Large OSS) and six 75 m wide GBS (Box-type). • Offshore accommodation platform foundation - 75 m wide GBS (Box-type).	Installed foundations may lead to local scouring around their base if scour protection has not already pre-armoured the seabed. Depending on the seabed material, the scouring process may erode material into bedload and/or suspended load transport until an equilibrium condition is reached. In general, the largest foundation with the greatest solidity ratio will have the largest blockage effect on flows and will develop the most amount of scour, rather than the greatest depth of scour. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co201 Tertiary: Co82	**Impact not identified at Scoping (for construction phase)**	**Simple Assessment**	Impact not identified at Scoping (for construction phase), Scoped in for assessment at PEIR (for operation phase - PEIR reference: MP-O-3).	Pathway	N/A	**No significant effect (pathway)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES.	Pathway	N/A	**No significant effect (pathway)**
MP-C-4	Landfall	Construction	Turbulent wakes around cofferdams	**Landfall:** Inshore temporary cofferdams 18 m wide (long-shore) and 50 m long (cross-shore) to enclose HDD exit pits (up to 900 m^2), separated by a minimum of 50 m in a shore parallel configuration. Up to three cofferdams in place at any time for up to three months for up to eight cofferdams in total (HVDC option). Groups of up to three cofferdams have the potential to form wakes in their lee over the period of installation.	Cofferdams may lead to local blockage effects in the nearshore landfall area interrupting local flows and waves which may also lead to local scouring around their base, subject to the erodibility of the seabed. Closely spaced cofferdams may also lead interaction of wakes and lead to group scour.	Primary: Co2 Secondary: Co187	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at Scoping. Scoped in for assessment at PEIR (for operation phase - PEIR reference: MP-O-4).	Fraisthorpe Sands (and cliffs): Minor	Fraisthorpe Sands (and cliffs): Low	**No significant effect (minor adverse)**	**Simple Assessment**	Project details further refined and assessment included for ES.	Fraisthorpe Sands (and cliffs): Negligible	N/A	**No significant effect (not significant)**

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MP-O-1	All offshore	Operation	Scouring around rock berms	**<u>Offshore ECC:</u>** • **Rock berms at nearshore cable crossing along ECC -** Up to six export cables (HVAC option) from Hornsea Four will cross the export cables (up to two pairs of cables) of Dogger Bank A and B (12 crossings) at a location seaward of Smithic Bank to form the largest overall crossing. • **Rock berms at offshore cable crossings along ECC -** Seven additional locations with up to 42 crossings (excluding locations within offshore array area)within offshore array area). • Total of 54 crossings at eight locations along ECC (excluding locations within offshore array area) with rock berm volume of 372,000 m^3. **<u>Offshore array area:</u>** • **Rock berms at cable crossings -** up to 32 array cable crossings (total rock berm area of 221,000 m^3) plus two further locations for sections of offshore ECC within the offshore array area. • All cable crossings up to 3 m in height (0.3m pre-lay plus 2.7 m rock berm) where protection is required from anchors using rock up to 0.5 m in diameter. **Total volume for all rock berms 593,000 m^3 -** with provisions for 25 % replenishment during operation period, if required. **Cable protection** • A provision to use cable protection for up to 10 % of the length of all cables for locations which do not achieve full burial depths (excluding inshore area). Offshore ECC: 849,000 m^3 Offshore Array: 600,000 m^3 **Total volume: 1,449,000 m^3**	Sub-sea structures proud of the seabed (e.g. rock berms), may lead to local scouring around their base. Depending on the seabed material, the scouring process may erode material into bedload and/or suspended load transport until an equilibrium condition is reached.	<u>Tertiary:</u> Co81 Co82 Co83 <u>Secondary:</u> Co188 Co189	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at Scoping. Scoped in for assessment at PEIR (PEIR reference: MP-O-3).	Pathway	Negligible	**No significant effect (pathway)**	**Detailed Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new detailed assessment, drawing on additional modelling.	Offshore ECC: Negligible Offshore array area: Pathway	N/A	**No significant effect (pathway)**
MP-O-2	All offshore	Operation	Turbulent wakes from foundations interfering with remote receptors, e.g. Flamborough Front	**<u>Offshore ECC:</u>** • **HVAC booster station foundations -** Largest solid structure in the vertical plane (for blockage-type effects) is the 75 m width GBS (Box-type). The wake formation may depend on the orientation of this structure to incident flows and waves as well as the minimum spacing between structures and the layout of all three structures. A minimum separation distance of 100 m between foundations is likely to result in wake-wake interactions and a larger cumulative effect between all three structures. • **Rock berms -** Minimal vertical profile with all in water depths between 40 to 50 m below LAT. No likely wake effects. **<u>Offshore array area:</u>** • **180 WTG foundations -** The foundation considered to have the greatest blockage effect for MDS is the 53 m diameter base conical shaped GBS (WTG-type), limit of up to 110 units. The next largest MDS foundation for blockage is the mono-suction bucket which has a base diameter of up to 40 m with a height of up to 10 m above the seabed (70 units or more). • **Nine OSS foundations -** For the six small OSS, the 75 m GBS (Box-type) foundation has the greatest blockage effect. For the three large OSS foundations, the large 150 m GBS (Box -type) foundation has the largest blockage. • **Offshore accommodation platform foundation -** 75 m GBS (Box-type) foundation has the greatest blockage effect. The total blockage effect for the whole offshore array is also a function of the spacing and layout of all 190 foundations. The principles for the array layout are based on a minimum WTG separation of 810 m from foundation centres.	Typically, greatest amounts of turbulence will occur from the largest foundation width with the highest solidity ratio which blocks the passage of incident flows and waves (as well as sediment transport moved by these processes). Rock berms in deeper water are unlikely to have sufficient vertical profile to develop wakes, however, if there were equivalent structures in shallower water, they may have a proportionally larger influence and develop partial wakes. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	<u>Primary:</u> Co201 <u>Tertiary:</u> Co81	**Likely significant effect without secondary mitigation** Flamborough Front is relatively close but also limited in position by deeper water to the north. The scale of any wake reaching the front needs to consider further details of the project description such as array layout and foundation spacing.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Landfall area - Fraisthorpe Sands (and cliffs): Minor HVAC booster area: Pathway Offshore array area - Flamborough Front: Minor	Landfall area - Fraisthorpe Sands (and cliffs): Low HVAC booster area: Pathway (N/A) Offshore array area - Flamborough Front: Medium	**Landfall area - Fraisthorpe Sands (and cliffs): No significant effect (Minor Adverse)** **HVAC booster area: Pathway (N/A)** **Offshore array area - Flamborough Front: No significant effect (Minor Adverse)**	**Detailed Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new detailed assessment, drawing on additional modelling.	HVAC booster area: Pathway Offshore array area - Flamborough Front: Minor	HVAC booster area: Pathway (N/A) Offshore array area - Flamborough Front: Medium	**HVAC booster area: Pathway (N/A)** **Offshore array area - Flamborough Front: No significant effect (Slight Adverse)**
MP-O-3	All offshore	Operation	Changes to waves affecting coastal morphology	**<u>Offshore ECC:</u>** • **Rock berms at nearshore cable crossings -** Dogger Bank A and B cable crossing at a location > 20 m below LAT with a berm height of up to 3 m. • **HVAC booster station foundations -** Largest solid structure in the vertical plane is the 75 m width GBS (Box-type). These structures have the potential to block, reflect and scatter incident waves. A minimum separation distance of 100 m is likely to result in some wave interactions and a larger cumulative effect between structures. • **Rock berms at offshore cable crossings -** Seven crossings further offshore in water depths between 40 to 50 m below LAT. **<u>Offshore array area:</u>** • **180 WTG foundations -** The foundation considered to have the greatest blockage effect for MDS is the 53 m diameter base conical shaped GBS (WTG-type), limit of up to 110 units. The next largest MDS foundation for blockage is the mono-suction bucket which has a base diameter of up to 40 m with a height of up to 10 m above the seabed (70 units or more). • **Nine OSS foundations -** For the six small OSS, the 75 m GBS (Bbox-type) foundation has the greatest blockage effect. For the three large OSS foundations, the large 150 m wide GBS (Box -type) foundation has the largest blockage effect. • **Offshore accommodation platform foundation -** 75 m wide GBS (Box-type) foundation has the greatest blockage effect.	This is a specific impact related to blockage of waves on the coastline as a receptor prone to high cliff erosion rates and strong longshore transport. The previous selection of MDS for largest blockage related effects apply. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	<u>Primary:</u> Co201 <u>Secondary:</u> Co188 Co189 <u>Tertiary:</u> Co81	**Likely significant effect without secondary mitigation** Distance from Hornsea Four array area is expected to be sufficient so that any wave attenuation is fully dissipated before reaching the coastline.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (negligible adverse)**	**Detailed Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new detailed assessment, drawing on additional modelling.	Negligible	Holderness Coast and cliffs: High Smithic Bank: Medium	**No significant effect (not significant)**
MP-O-4	Offshore ECC	Operation	Changes to nearshore sediment pathways	• **Rock berms at cable crossings -** Hornsea Four will cross the Dogger Bank A and B export cables seaward of Smithic Bank. Maximum berm height of 2.7 m, plus a pre-lay berm of 0.3 m (total hright of up to 3 m), placed seaward of 20 m below LAT isobath. • Remedial rock protection also assumed for 10% of offshore ECC cable length in addition to any cable crossings. • **HVAC booster station foundations -** Three GBS (Box-type) foundations closely spaced at 100 m may moderate nearshore waves and longshore sediment transport.	This issue relates to the consequence of changes to nearshore flows and waves that drive nearshore sediment pathways.	<u>Secondary:</u> Co188 Co189 <u>Tertiary:</u> Co81	**No likely significant effect** Previous assessments for Hornsea projects have shown that impacts on sediment pathways are likely to be of minor adverse significance. Given the anticipated localised nature of the changes in tidal currents and waves for Hornsea Four, there is anticipated to be no local or regional changes in the sediment transport regime. Furthermore, Hornsea Four is situated updrift in the sediment pathway that is related to the Norfolk Banks SAC.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Full assessment to be undertaken once project details have been further refined and will be provided within the final DCO application.			**Simple Assessment**	Project details further refined and additional baseline data acquired and reassessed in ES.	Negligible to Minor	Medium	**No significant effect (slight adverse)**

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MP-O-5	All offshore	Operation	Cable reburial and repair	**Export Cable Activities:** • Re-burial of up to 2 km in length for any single event (equivalent to 12,000 m^3 of disturbed sediment for a seabed release by CFE) to a total of 14 km over the lifetime of the project (equivalent to a total volume of 84,000 m^3 of disturbed sediment). • For cable repairs, the MDS option is based on full de-burial and re-burial of the relevant section of cable using jetting equipment (i.e. CFE or similar) with a provision for up to 23 repairs over the operational phase. **Array Cable Activities:** • Re-burial of up to 2 km in length for any single event (equivalent to 12,000 m^3 of disturbed sediment for a seabed release by CFE) to a total of 42 km over the lifetime of the project (equivalent to a total volume of 252,000 m^3 of disturbed sediment). • For cable repairs, the MDS option is based on full de-burial and re-burial of the relevant section of cable using jetting equipment (i.e. CFE or similar) with a provision for up to 10 repairs over the operational phase. **Interconnector Cable Activities:** • Re-burial of up to 2 km in length for any single event (equivalent to 12,000 m^3 of disturbed sediment for a seabed release by CFE) to a total of 7 km over the lifetime of the project (equivalent to a total volume of 42,000 m^3 of disturbed sediment). • For cable repairs, the MDS option is based on full de-burial and re-burial of the relevant section of cable using jetting equipment (i.e. CFE or similar) with a provision for up to three repairs over the operational phase.	Largest disturbed volume and highest trenching rate per event by CFE produces the greatest rate of sediment release at source. These effects are considered to be comparable to cable installation (MP-C-2), but are moderated by the limits on the maximum amount of cable per event.	Primary: Co44 Co45 Secondary: Co188	**Impact not identified at Scoping**	**Impact not identified at PEIR**	Impact not identified at PEIR	N/A	N/A	**N/A**	**Simple Assessment**	Impact identified after PEIR and added to ES assessment.	Cable trenching in ECC - Bridglington harbour: Minor Foundation drilling and cable trenching in array: Pathway	Cable trenching in ECC - Bridglington harbour: Medium Foundation drilling and cable trenching in array: Pathway	**Cable trenching in ECC - Bridglington harbour: No LSE (Slight)** **Foundation drilling and cable trenching in array: Pathway**
MP-O-7	All offshore	Operation	Changes to offshore sediment pathways	N/A as scoped out.	N/A as impact scoped out	N/A	**No likely significant effect** Given the anticipated localised nature of the changes in tidal currents and waves for Hornsea Four, there is anticipated to be no local or regional changes in the sediment transport regime. Furthermore Hornsea Four is situated updrift in the sediment pathway that is related to the Norfolk Banks SAC. On the basis of a proportionate approach, this issue is therefore scoped out	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.1.2). Given the anticipated localised nature of the changes in tidal currents and waves for Hornsea Four, there is expected to be no local or regional changes in the sediment transport regime. Furthermore, Hornsea Four is situated updrift of the net sediment pathway related to the Norfolk Banks SAC.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
MP-D-1	All offshore	Decommissioning	Sediment disturbance All direct sediment disturbance activities during decommissioning that may lead to locally raised SSC at source.	• The assumption is for comparable (or lesser) rates of sediment disturbance to those described for installation of foundations. • Cables are expected to remain *in situ* . • Scour protection and rock berms at cable crossings are planned to remain *in situ* .	Foundation removal is likely to involve cutting off any piles and lift of the main structure and would involve a smaller footprint than any seabed preparation activity.	N/A	**Likely significant effect without secondary mitigation** Project description details to be developed for excavation quantities and construction rates. Sediment material is likely to fall out of suspension relatively quickly.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Pathway	N/A	**No significant effect (pathway)**	**Simple Assessment**	Project details further refined and additional baseline data acquired and reassessed in ES.	Pathway	N/A	**No significant effect (pathway)**
MP-D-2	All offshore	Decommissioning	Changes to tidal and wave regimes associated with the removal of foundations	Removal of the following foundations and cessation of associated blockage effects: **Offshore ECC:** • **HVAC booster station foundations -** largest solid structure in the vertical plane is the 75 m width GBS (Box-type). **Offshore array area:** • **180 WTG foundations -** The reversal of MP-O-2 and MP-O-3 foundation options. • **Nine OSS foundations -** For the six small OSS, the 75 m GBS (Box-type) foundation has the greatest blockage effect. For the three large OSS foundations, the large 150 m GBS (Box -type) foundation has the largest blockage effect. • **Offshore accommodation platform foundation -** 75 m GBS (Box-type) foundation has the greatest blockage effect. The total blockage effect for the whole offshore array is also a function of the spacing and layout of all 190 foundations. The principles for the array layout are based on a minimum WTG separation of 810 m from centres.	Removal of the greatest number of turbines with the minimum spacing between turbines, combined with the largest proposed foundation option presents the maximum blockage, and hence the greatest influence on wave and tidal regimes once removed. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	N/A	**Impact not identified at Scoping**	**Impact not identified at PEIR**	Impact not identified at PEIR	N/A	N/A	**N/A**	**Simple Assessment**	Impact identified after PEIR to added to ES assessment.	Negligible	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
BIE-C-1	All-Offshore	Construction	Temporary habitat disturbance in the Hornsea Four array area and offshore ECC from construction activities.	**Temporary habitat disturbance of 75,895,509 m²** **Array Area:** **Foundation seabed preparation = 779,106 m²** • 110 GBS (WTG) type) foundations for WTGs = 411,321 m²; • 70 suction caisson jacket (WTG type) foundations for WTGs = 198,870 m². • Six small Offshore Substations (OSS) on suction caisson jacket (small OSS) foundations and three large OSS on GBS (large OSS) foundations = 156,594 m²; and • One accommodation platform on a suction caisson jacket (small OSS) foundation = 12,321 m². **Jack up and anchoring operations = 1,063,200 m²** • WTG installation jack up vessel (JUV) footprint (six legs, 170 m² per foot, four jack-up operations per turbine) = 734,400 m²; • WTG installation vessel anchor footprints (100 m² per anchor, eight anchors per vessel, two anchored vessels per turbine) = 288,000 m²; and • OSS and accommodation platform installation JUV footprint (six legs, 170 m² per foot, four jack-up operations per structure) = 40,800 m². **Cable seabed preparation and installation in the array area = 37,950,000 m²** • Boulder and sandwave clearance in array area (690 km length, 40 m width) = 27,600,000 m²; • Burial of array cables (600 km length, 1.5 m width) = 9,000,000 m²; and • Burial of inter-connector cables (90 km length, 1.5 m width) = 1,350,000 m². Note the 1.5 m cable width is located within the boulder and sandwave clearance 40 m width. **Offshore ECC:** • Foundation seabed preparation for three suction caisson jacket (small OSS) foundations = 36,963 m²; and • OSS installation JUV footprint (six legs, 170 m² per foot, four jack-up operations per structure) = 12,240 m². **Export cable seabed preparation and installation = 36,054,000 m²** • Boulder and sandwave clearance in offshore ECC (654 km length, 40 m width) = 26,160,000 m²; • Burial of export cables (654 km length, 1.5 m width) = 9,810,000 m²; and • Cable jointing (four joints per cable, six cables, 3,500 m² per joint) = 84,000 m². • Note the 1.5 m cable width is located within the boulder and sandwave clearance 40 m width.	The temporary disturbance relates to seabed preparation for foundations and cables, jack up and anchoring operations, and cable installation. It should be noted that the seabed preparation area for foundations is less than the footprint of the foundation scour protection and the footprint of infrastructure is assessed as a permanent impact in O&M (BIE-O-8). It should be noted that the MDS presents a precautionary approach to temporary habitat disturbance because it counts both the total footprint of seabed clearance as well as cable burial across both the array and offshore ECC. This approach effectively counts the footprint of seabed habitat to be impacted by construction in the same area twice. However, this precautionary approach has been taken because there is some potential for recovery of habitats between the activities due to project timescales. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co44 Co45 Co48 Co84 Co86 Co201 Secondary: Co188 Co189	**No likely significant effect** No likely significant effect with embedded mitigation. The biotopes present generally have a low sensitivity to this impact. Furthermore, the impact will be spatially restricted to a small proportion of the seabed within the Hornsea Four array area and ECC; anticipated to be less than 5% of the total array area and ECC based on area of temporary disturbance reported in project ES's of similar sized developments within the region.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.1).	Negligible to Minor	Medium to Very High	**No significant effect (Not Significant to Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Slight)**
BIE-C-2	Landfall	Construction	Temporary habitat disturbance in the intertidal area from export cable installation.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Primary: Co44 Co84 Co86 Secondary: Co187	**No likely significant effect** Biotopes present at the landfall area are not sensitive to physical disturbance and have a high recoverability.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.2).	Minor	Low	**No significant effect (Not Significant)**	**Not considered in detail in the ES**	Simple assessment at PEIR. Project description refined, with commitment made for Horizontal Directional Drilling (HDD) or other trenchless method underneath the intertidal area (Co187); no temporary habitat disturbance will occur within the intertidal as the two HDD works exit pits will be located within the subtidal area (below MHWS) and will be discrete in nature. Not considered in the ES.	N/A	N/A	**No significant effect**
BIE-C-3	All-Offshore	Construction	Temporary increase in SSC and sediment deposition in the Hornsea Four array area and offshore ECC.	**Total volume 12,192,331 m³** **WTG Foundations:** • 110 turbines on GBS (WTG type) foundations requiring seabed preparation, resulting in the suspension of 685,794 m³ of sediment; and • 70 Suction Caisson Jacket (WTG type) foundations requiring seabed preparation, resulting in the suspension of 359,427 m³ of sediment. **OSS Foundations (array):** • Six OSS on suction caisson jacket (small OSS) foundations and three OSS on GBS (large OSS) foundations requiring seabed preparation, resulting in the suspension of 737,130 m³ of sediment. **Offshore Accommodation Platform Foundations:** • One suction caisson jacket (small OSS) foundation requiring seabed preparation, resulting in the suspension of 57,245 m³ of sediment. **High Voltage Alternating Current (HVAC) Booster Station Foundations:** • Three suction caisson jacket (small OSS) foundations requiring seabed preparation, resulting in the suspension of 171,735 m³ of sediment. **Sandwave Clearance:** • Sandwave clearance for 600 km of array cables resulting in the suspension of 769,000 m³ of sediment; • Sandwave clearance for 90 km of interconnector cables resulting in the suspension of 115,000 m³ of sediment; and • Sandwave clearance for 654 km of export cables resulting in the suspension of 834,000 m³ of sediment. **Cable Trenching:** • Installation of 600 km of array cables by Controlled Flow Excavation (CFE) resulting in the suspension of 3,600,000 m³ of sediment; • Installation of 90 km of interconnector cables resulting in the suspension of 540,000 m³ of sediment; • Installation of six export cables by CFE resulting in the suspension of 3,903,000 m³ of sediment (excluding the part of the export cable within the array); and • Up to 420,000 m³ of sediment from up to four cable joints per export cable in the ECC.	The MDS for foundation installation results from the largest volume suspended from seabed preparation (GBS and suction caisson jacket foundations). For cable installation, the MDS results from the greatest volume from sandwave clearance and installation using energetic means (CFE). This also assumes the largest number of cables and the greatest burial depth. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co44 Co45 Co84 Co86 Co201 Secondary: Co188 Co189	**No likely significant effect** The biotopes present within the array area and offshore ECC have a limited sensitivity to increased SSC which will occur over a limited period/area.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.3).	Minor	Low to High	**No significant effect (Not Significant to Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Minor	Not Sensitive to Medium	**No significant effect (Slight)**
BIE-C-4	Landfall	Construction	Temporary increase in SSC and sediment deposition in the intertidal area.	Eight offshore cofferdam HDD exit pits require excavation of 20,000 m³ (8 x 2,500 m³), which will be side-cast onto the adjacent seabed. Backfilling of exit pits will recover a similar amount from the surrounding seabed, as required. HDD exit pits will come out below MLWS, so will not directly impact the intertidal. HDD Bentonite drilling fluid loss per cable 265 m³.	The MDS for temporary habitat disturbance in the intertidal area from the HDD works is included. It is important to note that HDD exit pits will be located below MLWS. The maximum volume of bentonite which could be released as part of the landfall activities is considered. For this assessment, it is considered that the bentonite would not be captured and is released into the marine environment.	Primary: Co2 Co44 Co45 Co84 Co86	**No likely significant effect** Biotopes present at the landfall area are not sensitive to this impact.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.4).	Minor	Low	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
BIE-C-5	Array Area	Construction	Construction phase: Impacts on benthic ecology from noise arising from foundation installation.	N/A as impact scoped out.	N/A as impact scoped out	None	**No likely significant effect** No likely significant effect with embedded mitigation. The magnitude of effect will be spatially and temporally restricted and benthic species have a low sensitivity to noise impacts.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.1.4). It is generally accepted that the particle motion component of noise is most relevant to benthic species. While there are few studies looking at reactions of benthic invertebrates and in particular polychaetes and infaunal bivalves it is likely that particle motion will dissipate in close proximity to the noise source. In addition, the noise will be temporary in nature and conditions will return to baseline following cessation of piling. The Marine Evidence based Sensitivity Assessment (MarESA) suggest that the potential effects associated with the construction of a wind farm is 'not relevant' for the biotopes present. Therefore, this impact has been scoped out of the assessment.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
BIE-C-6	All-Offshore	Construction	Direct and indirect seabed disturbances leading to the release of sediment contaminants.	The MDS for seabed disturbance are presented in BIE-C-3.	This scenario represents the maximum total seabed disturbance and therefore the maximum amount of contaminated sediment that may be released into the water column during construction activities.	None	**No likely significant effect** Low levels of contaminants in the offshore area and fast settlement of coarse sediments.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.5).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**
BIE-C-7	All-Offshore	Construction	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology.	N/A as impact scoped out.	N/A as impact scoped out	Tertiary: Co111	**No likely significant effect** No likely significant effect with embedded mitigation. Mitigation will effectively reduce risk of impact to negligible.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.1.6). The magnitude of an accidental spill incident will be limited by the size of chemical or oil inventory on construction vessels. In addition, released hydrocarbons would be subject to rapid dilution, weathering and dispersion and would be unlikely to persist in the marine environment. The likelihood of an incident will be reduced by implementation of a project CPEMMP, undertaken in accordance with Co111. Furthermore, the biotopes present within the array area and ECC are considered to be tolerant of chemical pressures, as presented within the MarESA assessment. This impact has therefore been scoped out of the assessment.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
BIE-C-19	Onshore ECC	Construction	Construction phase: Nitrogen Oxides (NOx) and Nutrient Nitrogen (NN) deposition may affect intertidal habitats and ecology	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Primary Co134 Co135 Tertiary Co64 Co114 Co124	**Impact not identified at Scoping**	**Impact not identified at PEIR**	Impact not identified at PEIR	N/A	N/A	**N/A**	**Scoped Out**	Air quality modelling (**Volume A3, Chapter 9: Air Quality**) predicts that the project acting alone does not contribute to more than a 1% change to the critical load of NOx and NN. Notwithstanding the project's minimal contributions, the 1% threshold was marginally exceeded when considered in-combination. As detailed within B2.2: Report to Inform Appropriate Assessment, it was concluded, with reference to the small area of supporting intertidal habitat affected, the small, temporary contributions to the critical load the project would not result in Adverse Effects on Site Integrity (AEoI) of the Humber Estuary SAC, SPA and Ramsar. The same conclusion can be drawn in relation to the Humber Estuary SSSI. This impact was not identified during Scoping but was highlighted through the HRA process. After full assessment and conclusion of no AEoI, there was no evidence to trigger the need for inclusion of this impact within the ES. Furthermore, it should be noted that the intertidal area within the Hornsea Four Order Limits is characterised by the biotope A2.221, 'barren littoral coarse sand'. As this biotope is characterised by the lack of species, exposure to contaminants will not result in significant impacts to ecology, as there are no sensitive receptors. This impact has therefore not been considered further in this assessment.	N/A	N/A	**No significant effect**
BIE-O-8	All-Offshore	Operation	Long-term habitat loss/ change from the presence of foundations, scour protection and cable protection.	**Habitat change of 3,730,671 m².** **Array Area:** • Turbine footprint with scour protection, based on 110 GBS (WTG-type) foundations = 504,540 m²; • Turbine footprint with scour protection, based on 70 suction caisson Jacket (WTG type) foundations = 296,881 m². • OSS foundations footprint and scour protection, based on six small (GBS (Box-type)) and three large OSS (GBS (Large OSS)) = 371,250 m²; • Accommodation platform foundation footprint and scour protection, based on one small OSS foundation (GBS (Box-type)) = 30,625 m²; • Maximum rock protection area for array cable = 624,000 m²; • 25% replenishment of scour protection during operation and maintenance phase = 156,000 m²; • Maximum rock protection area for interconnector cable = 94,000 m²; • 25% replenishment of scour protection during operation and maintenance phase = 23,500 m²; and • Pre and post-lay rock berm area within array area (32 cable crossings) = 204,000 m². **Offshore ECC:** • HVAC booster station foundations footprint and scour protection, based on three small OSS foundations (GBS (Box-type)) = 91,875 m²; • Maximum rock protection area for the export cable = 792,000 m²; • 25% replenishment of scour protection during operation and maintenance phase = 198,000 m²;and • Pre- and post-lay rock berm area, based on 54 cable crossings within the export ECC area = 344,000 m².	The MDS is defined by the maximum area of seabed lost as a result of the placement of structures, scour protection, cable protection and cable crossings. Habitat loss from drilling and drill arisings is of a smaller magnitude than presence of project infrastructure. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co44 Co45 Co83 Co84 Co86 Co201 Secondary: Co188 Co189 Tertiary: Co82 Co176	**No likely significant effect** No likely significant effect with embedded mitigation. This impact will be spatially restricted to the direct footprint of the installed structures and accounting for a small proportion of the overall Hornsea Four array area and ECC.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.6).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Minor	High	**No significant effect (Slight adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
BIE-O-9	All-Offshore	Operation	Colonisation of the WTGs and scour/cable protection may affect benthic ecology and biodiversity.	**Total surface area of introduced hard substrate in the water column = 4,759,171 m^2.** **Total area of introduced hard substrate at seabed level = 3,730,671 m^2 (see BIE-O-8).** **Total surface area of subsea portions of foundations in contact with the water column: 1,028,500 m^2.** • 110 WTGs on GBS (WTG-type) foundations, assuming 15m diameter cylinder atop a conical/frustum base which tapers at 35m above seabed level, with a base diameter of 53 m. Average water depth of 47.5m, giving a per-foundation surface area of 5,650 m^2, with a total area of 621,500 m^2; • 70 WTGs on suction bucket jacket (WTG type) foundations, which has a base diameter of up to 40 m (extending 10 m above the seabed). Average water depth of 47.5 m, giving a per foundation surface area of 2,512 m^2, with a total area of 175,850 m^2; • Six small OSS on GBS (Box-type) foundations, each with a length and width of 75 m at seabed level and at Lowest Astronomical Tide (LAT). Average water depth of 47.5 m, giving a per- foundation surface area of 14,250 m^2, with a total area of 85,500 m^2; • Three Large OSS on GBS (Box-type) foundations, each with a length and width of 150 m at seabed level and at LAT. Average water depth of 47.5 m, giving a per-foundation surface area of 28,500 m^2, with a total area of 85,500 m^2; • One accommodation platform on a GBS (Box-type) foundation (small OSS), with a length and width of 75 m at seabed level and at LAT. Average water depth of 47.5 m, giving a total surface area of 14,250 m^2; and • Three HVAC booster stations on GBS (Box-type) foundations (small OSS), each with a length and width of 75 m at seabed level and at LAT. Average water depth of 51 m in the HVAC Booster Station Search Area, giving a per-foundation surface area of 15,300 m^2, with a total area of 45,900 m^2.	The MDS is defined by the maximum area of structures, scour protection, cable protection and cable crossings introduced to the water column, including surface area of vertical structures. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	None	**No likely significant effect** Small area of hard substrate within predominately sedimentary habitats.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.7).	Minor	Medium	**No significant effect (Minor Adverse or Beneficial)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Minor	High	**No significant effect (Slight adverse)**
BIE-O-10	All-Offshore	Operation	Increased risk of introduction or spread of Marine Invasive Non-Native Species (MINNS) due to presence of subsea infrastructure and vessel movements (e.g. ballast water) may affect benthic ecology and biodiversity.	**Total surface area of introduced hard substrate in the water column = 4,759,171 m^2 (see BIE- O-9).** **Total of 1,693 vessel return trips per year:** • 206 crew shift transfer visits; • 124 JUV visits; • 1,205 crew vessels wind turbine visits; and • 104 supply vessel accommodation platform visits.	Defined by the maximum surface area introduced into the water column as described in BIE-O-9. MDS with regards to maximum number of vessel movements during O&M activities.	Tertiary: Co111	**No likely significant effect** No likely significant effect with embedded mitigation which will mitigate risk of MINNS to negligible.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.8).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**
BIE-O-11	All-Offshore	Operation	Direct disturbance to seabed from jack-up vessels and cable maintenance activities.	**Direct disturbance to seabed from jack-up vessels and cable maintenance activities = 8,579,812 m^2.** **WTG O&M activities:** • Component replacement = 378,000 m^2; • Access ladder replacement = 378,000 m^2; • Foundation anode replacement = 378,000 m^2; and • J-Tube repair/ replacement = 108,000 m^2. **Array cable activities:** • Remedial burial of array cables (42 km total length reburied) = 4,200,000 m^2; • Array cable repairs = 363,736 m^2; and • Cable protection replacement = 156,000 m2. **Offshore substations and accommodation platform activities:** • Offshore substation component replacement = 6,000 m^2; • Access ladder replacement = 90,000 m^2; • Foundation anode replacement = 21,000 m^2; and • J-Tube repair/ replacement = 6,000 m^2. **ECC activities:** • Remedial burial of export cables (1.4 km total length reburied) = 1,400,000 m^2; • Export cable repairs = 153,548 m^2; and • Cable protection replacement = 198,000 m^2. **Interconnector cable activities:** • Remedial burial of interconnector cables (7 km total length reburied) = 700,000 m^2; • Interconnector cable repairs = 20,028 m^2; and • Cable protection replacement = 23,500 m^2.	Defined by the maximum number of jack-up vessel operations and maintenance activities that could have an interaction with the seabed anticipated during operation.	None	**No likely significant effect** No likely significant effect with embedded mitigation and as a result of the small spatial and temporal scale of any disturbance.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.9).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**
BIE-O-12	All-Offshore	Operation	Operation phase: Indirect disturbance to benthic species from Electromagnetic Fields (EMF) generated by inter-array and export cables.	N/A as impact scoped out.	N/A as impact scoped out	Primary: Co83	**No likely significant effect** No likely significant effect with embedded mitigation and due to the small spatial scale of the impact.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.15). EMFs are likely to increase above background levels in close proximity to the cables only. As the cable will be buried (Co83) or protected across the majority of the array area and ECC, any behavioural responses would be further mitigated. Furthermore, monitoring to date has not recorded any changes in invertebrate behaviour resulting from EMF exposure. However, it is acknowledged that there are limited studies in this field. It is considered that benthic communities are not sensitive to EMF around subsea cables. This impact has therefore been scoped out.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
BIE-O-13	All-Offshore	Operation	Changes to seabed habitats arising from effects on physical processes, including scour effects and changes in the sediment transport and wave regimes resulting in potential effects on benthic communities.	See MDS presented in **Chapter 1: Marine Geology, Oceanography and Physical Processes**.	This impact is defined by any anticipated changes to physical processes as defined in **Chapter 1: Marine Geology, Oceanography and Physical Processes**.	Primary: Co201 Secondary: Co189	**No likely significant effect** No likely significant effect due to modelling of physical processes at adjacent projects predicting only small local effects and the tolerance of local benthic communities.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.10).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Negligible	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
BIE-O-14	All-Offshore	Operation	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology.	N/A as impact scoped out.	N/A as impact scoped out	Tertiary: Co111	**No likely significant effect** No likely significant effect with embedded mitigation. Mitigation will effectively reduce risk of impact to negligible.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.1.7). The magnitude of an accidental spill incident will be limited by the size of chemical or oil inventory on vessels. In addition, released hydrocarbons would be subject to rapid dilution, weathering and dispersion and would be unlikely to persist in the marine environment. Furthermore, the biotopes present within the array area and ECC are considered to be tolerant of chemical pressures, as presented within the MarESA assessment. This impact has therefore been scoped out of the assessment.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
BIE-D-15	All-Offshore	Decomissioning	Temporary habitat disturbance from decommissioning of foundations, cables and rock protection.	Removal of all foundations, cables and rock protection leading to a temporary loss/change of 3,730,671 m^2.	MDS is assumed to be similar to the construction phase, with all infrastructure removed in reverse-construction order. The removal of cables and rock protection is considered the MDS, however the necessity to remove cables and rock protection will be reviewed at the time of decommissioning.	Tertiary: Co181	**No likely significant effect** No likely significant effect due to small spatial scale of impact and the tolerance of benthic biotopes.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.1.11).	Minor	High	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Minor	Medium	**No significant effect (Slight adverse)**
BIE- D-16	All-Offshore	Decomissioning	Increased SSC and sediment deposition from removal of foundations, cables and rock protection.	This impact is a subset of MP-C-2 for structures that are removed from the seabed. The impacts are expected to be equivalent to MP-C-2 apart from the structures that may remain (e.g. cables to be removed but not cable protection measures). See MDS presented in **Chapter 1: Marine Geology, Oceanography and Physical Processes**.	MDS is assumed to be as per the construction phase, with all infrastructure removed in reverse-construction order. The removal of cables is considered the MDS, however the necessity to remove cables will be reviewed at the time of decommissioning.	None	**No likely significant effect** No likely significant effect due to no biotopes of sensitivity to increased SSC being present within the array area or offshore ECC.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.1.12).	Minor	Medium	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Minor	Medium	**No significant effect (Slight adverse)**
BIE-D-17	All-Offshore	Decomissioning	Loss of introduced habitat from the removal of foundations and rock protection.	Total area of introduced hard substrate to be lost = 4,759,171 m^2.	Defined by the maximum surface area introduced as above. Some materials may be left *in situ* and this will be reviewed closer to the time of decommissioning. As such, the MDS assumes the removal of all infrastructure.	None	**No likely significant effect** No likely significant effect as removal of structures will return the seabed to habitats similar to those present prior to construction.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.1.13).	Minor	High	**No significant effect (Minor Adverse or Beneficial)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Additional baseline data acquired and reassessed in ES as new simple assessment.	Minor	Medium	**No significant effect (Slight adverse)**
BIE-D-18	All-Offshore	Decomissioning	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology.	N/A as impact scoped out.	N/A as impact scoped out	Tertiary: Co111	**No likely significant effect** No likely significant effect with embedded mitigation. Mitigation will effectively reduce risk of impact to negligible.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.3.1.8). The magnitude of an accidental spill incident will be limited by the size of chemical or oil inventory on vessels. In addition, released hydrocarbons would be subject to rapid dilution, weathering and dispersion and would be unlikely to persist in the marine environment. Furthermore, the biotopes present within the array area and ECC are considered to be tolerant of chemical pressures, as presented within the MarESA assessment. This impact has therefore been scoped out of the assessment.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
FSE-C-1	All-offshore	Construction	Direct damage (e.g. crushing) and disturbance to mobile demersal and pelagic fish and shellfish species arising from construction activities.	**Total area of direct disturbance = 75,895,509 m²** **Array Area = 39,792,306 m²** **Foundation seabed preparation = 779,106 m²** • 110 gravity-based structure (GBS) (wind turbine generator (WTG)-type) foundations for WTGs = 411,321 m²; • 70 suction caisson jacket (WTG type) foundations for WTGs = 198,870 m²; • Six small offshore substations (OSS) on suction caisson jacket (small OSS) foundations and three large OSS on GBS (large OSS) foundations = 156,594 m²; and • One accommodation platform on a suction caisson jacket foundation (small OSS) = 12,321 m². **Jack up and anchoring operations = 1,063,200 m²** • WTG installation jack up vessel (JUV) footprint (six legs, 170 m² per foot, four jack-up operations per turbine) = 734,400 m²; • WTG installation vessel anchor footprints (100 m² per anchor, eight anchors per vessel, two anchored vessels per turbine) = 288,000 m²; and • OSS and accommodation platform installation JUV footprint (six legs, 170 m² per foot, four jack-up operations per structure) = 40,800 m². **Cable seabed preparation and installation = 37,950,000 m²** • Boulder and sandwave clearance for array and interconnector cables in the array area - (690 km length, 40 m width) = 27,600,000 m²; and • Burial of array and inter-connector cables (690 km length, 1.5 m width) = 10,350,000 m². **Offshore ECC = 36,103,203 m²** • Three suction caisson foundations (small OSS) for up to three HVAC booster stations = 36,963 m²; • OSS installation JUV footprint (six legs, 170 m² per foot, four jack-up operations per structure) = 12,240 m²; • Boulder and sandwave clearance for export cables in offshore ECC (654 km length, 40 m width) = 26,160,000 m²; • Burial of export cables (654 km length, 1.5 m width) = 9,810,000 m²; and • Cable jointing (four joints per cable, six cables, 3,500 m² per joint) = 84,000 m².	Direct damage and disturbance relates to seabed preparation and cable installation. The footprint of infrastructure is assessed as a temporary impact in constriction, and as a permanent impact in operation and maintenance (O&M). It should be noted that for GBS foundations, the seabed preparation area is less than the footprint of the foundation scour protection. The MDS presents a precautionary approach to temporary habitat disturbance because it counts both the total footprint of seabed clearance as well as cable burial across both the array and offshore ECC. This approach effectively counts the footprint of seabed habitat to be impacted by construction in the same area twice. However, this precautionary approach has been taken because there is some potential for recovery of habitats between the activities due to project timescales. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co44 Co45 Co48 Co84 Co86 Co201 Secondary: Co188 Co189 Tertiary: Co111	**No likely significant effect** No likely significant effect is predicted due to the impact being spatially restricted to a small proportion of the seabed within the Hornsea Four array area and ECC; anticipated to be less than 5% of the total development area.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.1).	N/A	N/A	**No significant effect**	**Simple Assessment**	Scoped back into assessment at request of consultees.	Negligible to Minor	Low to High	**No significant effect (Not Significant to Slight Adverse)**
FSE-C-2	All-offshore	Construction	Temporary localised increases in Suspended Sediment Concentrations (SSC) and smothering.	**Total volume 12,213,921 m³** **WTG Foundations:** • 110 turbines on GBS foundations (WTG-type) requiring seabed preparation, resulting in the suspension of 685,794 m³ of sediment; and • 70 Suction Caisson Jacket (WTG type) foundations requiring seabed preparation, resulting in the suspension of 359,427 m³ of sediment. **OSS Foundations:** • Six small OSS on suction caisson jacket (small OSS) foundations and three large OSS on GBS (large OSS) foundations requiring seabed preparation, resulting in the suspension of 737,130 m³ of sediment. **Offshore Accommodation Platform Foundations:** • One suction caisson jacket (small OSS) foundation requiring seabed preparation, resulting in the suspension of 57,245 m³ of sediment. **HVAC Booster Station Foundations:** • Three suction caisson jacket (small OSS) foundations requiring seabed preparation, resulting in the suspension of 171,735 m³ of sediment. **Sandwave Clearance:** • Sandwave clearance for 600 km of array cables resulting in the suspension of 769,000 m³ of sediment; • Sandwave clearance for 90 km of interconnector cables resulting in the suspension of 115,000 m³ of sediment; and • Sandwave clearance for 654 km of export cables resulting in the suspension of 834,000 m³ of sediment. **Cable Trenching:** • Installation of 600 km of array cables by Controlled Flow Excavation (CFE) resulting in the suspension of 3,600,000 m³ of sediment; • Installation of 90 km of interconnector cables resulting in the suspension of 540,000 m³ of sediment; • Installation of 654 km of export cables resulting in the suspension of 3,903,000 m³ of sediment (excluding the part of the export cable within the array); and • Up to 420,000 m³ of sediment from up to four cable joints per export cable (six) in the ECC. **Landfall Area:** • Eight offshore cofferdam Horizontal Directional Drilling (HDD) exit pits require excavation of 2,500 m² each which will be side-cast onto the adjacent seabed. Backfilling of exit pits will recover a similar amount to be from the surrounding seabed, as required. Total excavated = 20,000 m³. • HDD Bentonite drilling fluid loss per cable 265 m³. Total drilling fluid loss = 1,590 m³.	The MDS for foundation installation results from the largest volume suspended from seabed preparation (GBS foundations and suction caisson foundations) with the maximum number of foundations (180) and associated offshore platform infrastructure. For cable installation, the MDS results from the greatest volume from sandwave clearance and installation using energetic means (CFE). This also assumes the largest number of cables and the greatest burial depth. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary. The maximum volume of bentonite which could be released as part of the landfall activities is considered. For this assessment, it is considered that the bentonite would not be captured and is released into the marine environment.	Primary: Co2 Co44 Co45 Co201 Tertiary: Co111	**No likely significant effect** No likely significant effect predicted on the basis that the species within the array area and offshore ECC have a limited sensitivity to increased SSC which will in any case occur over a limited period/area.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.2).	Minor	Medium to High	**No significant effect (Minor Adverse)**	**Simple Assessmemt**	Simple assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Minor	Low to High	**No significant effect (Neutral to Slight Adverse)**
FSE-C-3	All-offshore	Construction	Direct and indirect seabed disturbances leading to the release of sediment contaminants.	The MDS for seabed disturbance are presented in the rows above (FSE-C-2).	As above.	Primary: Co2 Co44 Co45 Co201 Tertiary: Co111	**No likely significant effect** No likely significant effect is predicted on the basis that there are low levels of contaminants in the offshore area and the fast settlement of coarse sediments	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.3).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessmemt**	Simple assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Negligible	N/A	**No significant effect (Not Significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
FSE-C-4	All-offshore	Construction	Mortality, injury, behavioural changes and auditory masking arising from noise and vibration.	**Array Area (spatial MDS):** • 180 monopile WTG foundations (1.5 m diameter) with a maximum of two foundations installed concurrently; • Six small OSS (1.5 m diameter monopiles); • Three large OSS (1.5 m diameter monopiles); • One offshore accommodation platform (1.5 m diameter monopiles); • Maximum hammer energy 5,000 kJ; • Four-hour piling duration; • 1.2 days per monopile; • 216 piling days (single vessel); • 106 piling days (two vessels); and • Maximum separation distance between piling events will be the maximum extent of the array area. **Array Area (temporal MDS):** • 180 WTGs on piled jacket (WTG-type) foundations (three 4 m diameter pin piles per jacket) – 540 pin piles; • Six OSS on piled jacket (small OSS) foundations (six legs per jacket and four 3.5 m pin piles per leg) – 144 pin piles; • Three OSS on piled jacket (large OSS) foundations (eight legs per jacket and two piles per leg) – 48 pin piles; • One offshore accommodation platform on a piled jacket (small OSS) foundation (six legs and four 3.5 m pin piles per leg – 24 pin piles; • Total of 756 pin piles in the array; • Maximum hammer energy 3,000 kJ; • 1.5 days per foundation; • 270 piling days (single vessel); and • 135 days (two vessels). **HVAC Booster Area of Search (spatial MDS):** • Three HVAC booster stations on 1.5 m diameter monopile foundations; • Maximum hammer energy 5,000 kJ; • Four-hour piling duration; and • 1.2 days per monopile. **HVAC Booster Area of Search (temporal MDS):** • Three HVAC booster stations on piled jacket (small OSS) foundations (six legs per jacket and four 3.5 m diameter pin piles per leg) – 72 pin piles. **UXO Clearance:** • Estimated 2,263 targets; • 86 UXOs may require clearance; • One UXO will be cleared every 24 hours; and • 86 detonations in 86 days.	Piling: For the array area, the spatial MDS results from the concurrent installation of monopile foundations for 180 WTGs in the NW and E corners of the array, and the sequential installation of monopile foundations for nine OSS and an offshore accommodation platform using 5,000 kJ hammer energy. This would result in the largest spatial noise impact at any given time. The temporal MDS for the array area would be associated with the installation of the maximum number of piles; the MDS would be the installation of 180 WTGs using piled jacket (WTG-type) foundations, and seven structures (OSS and an accommodation platform) on piled jackets (small OSS) and three OSS on piled jackets (large OSS). For HVAC booster stations, the spatial MDS is based on three OSS monopiles, and the temporal MDS is based on three OSS on piled jacket (small OSS) foundations. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary. UXO clearance: Estimated MDS based on the recent internal analysis report for Hornsea Three, the number of UXO requiring inspection and detonation has been scaled for Hornsea Four. A detailed UXO survey will be completed prior to construction. The type, size and number of possible detonations and duration of UXO clearance operations is therefore not known at this stage. Seabed clearance and installation activities such as cable laying, dredging and vessel movements may introduce an effect-receptor pathway for underwater noise, however these activities are established as producing low levels of noise, in the case of vessel movement no greater than the existing baseline of regional vessel noise, affecting a relatively small area in the immediate vicinity of activities. These general activities are therefore considered to fall within the impacts associated with piling and as such are not considered separately.	Primary: Co2 Co85 Secondary: Co190 Tertiary: Co110	**Likely significant effect without secondary mitigation** On the basis of potential subsea noise arising from piling activity and the presence of sensitive species (such as herring and sandeels within the Hornsea Four study area.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor	Medium to High	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Minor	Medium to High	**No significant effect (Slight Adverse)**
FSE-C-5	All-offshore	Construction	Accidental pollution events during the construction phase resulting in potential effects on fish and shellfish receptors.	N/A as impact scoped out.	N/A as impact scoped out	N/A	**No likely significant effect** No likely significant effect with embedded mitigation which will act to prevent or control pollution events.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.4). Accidental release of pollutants will be managed and mitigated through implementation of a CPEMMP (Co1.1.1), which will include details of a Marine Pollution Contingency Plan (MPCP) to address the risks, methods and procedures to deal with any spills and collision incidents of the authorised project in relation to all activities carried out below MHWS.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
FSE-O-18	All-offshore	Operation	Temporary localised increases in SSC and smothering.	**Total volume: 692,916 m^3** **Array Cable Activities:** • Remedial burial of array cable (42 km total length reburied) by CFE – 252,000 m^3; and • Array cable repairs = 218,258 m^3. **Interconnector Cable Activities:** • Remedial burial of interconnector cables (7 km total length reburied) by CFE = 42,000 m^3; and • Interconnector cable repairs = 11,153 m^3. **Export Cable Activities:** • Remedial burial of export cables (14 km total length reburied) by CFE = 84,000 m^3; and • Export cable repairs = 85,505 m^3.	The maximum impacts from remedial cable burial and cable repairs of array, interconnector and export cables result from the use of CFE. This assumes the largest number of cables, repair events, the greatest burial depth and greatest length/area of maintenance. This results in the maximum sediment volume disturbance.	Primary: Co2 Co44 Co45	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at Scoping but agreed to be assessed at PEIR following consultation with the Marine Ecology and Processes Technical Panel.	Minor	Medium to High	**No significant effect (Minor Adverse)**	**Simple Assessmemt**	Simple assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Minor	Low to High	**No significant effect (Neutral to Slight Adverse)**
FSE-O-6	All-offshore	Operation	Long-term loss of habitat due to the presence of turbine foundations, scour protection and cable protection.	**Total Habitat Loss/Change: 3,730,671 m^2** **WTGs:** • Turbine footprint with scour protection, based on 110 GBS (WTG-type) foundations = 504,540 m^2. • Turbine footprint with scour protection, based on 70 suction caisson Jacket (WTG type) foundations = 296,881 m^2. **OSS foundations:** • Offshore OSS foundation footprint and scour protection based on six small OSS on GBS (Box-type) foundations and three large OSS (on GBS (large OSS) foundations = 371,250 m^2. **HVAC Booster Station Foundations:** • Offshore HVAC booster substations and associated scour protection based on three GBS (Box-type) foundation = 91,875 m^2. **Offshore Accommodation Platform Foundations:** • Offshore accommodation platform and associated scour protection based on one GBS (Box-type) foundation = 30,625 m^2. **Array Cables:** • Maximum rock protection area = 624,000 m^2; • Pre- and post-lay rock berm area, based on 32 cable crossings = 204,000 m^2; and • 25% replenishment of scour protection during operation and maintenance phase = 156,000 m^2. **Interconnector Cable Protection:** • Maximum rock protection area = 94,000 m^2; and • 25% replenishment of scour protection during operation and maintenance phase = 23,500 m^2. **Offshore ECC:** • Maximum rock protection area = 792,000 m^2; • Pre- and post-lay rock berm area, based on 54 cable crossings = 344,000 m^2; and • 25% replenishment of scour protection during operation and maintenance phase = 198,000 m^2.	The maximum design scenario is defined by the maximum area of seabed lost by the footprint of structures on the seabed, scour protection, cable protection and cable crossings. Habitat loss from drilling and drill arisings is of a smaller magnitude than presence of project infrastructure. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co44 Co45 Co83 Co201	**No likely significant effect** No likely significant effect predicted since this impact will be sptially restricted to the direct footprint of the installed structures and accounting for a small proportion of the overall Hornsea Four array area and ECC; anticpated to be around 1%	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.5).	Minor	High	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Minor	Low to High	**No significant effect (Neutral to Slight Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
FSE-O-7	All-offshore	Operation	Increased hard substrate and structural complexity as a result of the introduction of turbine foundations, scour protection and cable protection.	**Total surface area of introduced hard substrate in the water column = 4,759,171 m².** **Total area of introduced hard substrate at seabed level = 3,730,671 m² (see FSE-O-6).** **Total surface area of subsea portions of foundations in contact with the water column: 1,028,500 m².** • 110 WTGs on GBS (WTG-type) foundations, assuming 15 m diameter cylinder atop a conical/frustum base which tapers at 35 m above seabed level, with a base diameter of 53 m. Average water depth of 47.5 m, giving a per-foundation surface area of 5,650 m², with a total area of 621,500 m²; • 70 WTGs on suction caisson jacket (WTG type) foundations, which has a base diameter of up to 40 m (extending 10 m above the seabed). Average water depth of 47.5 m, giving a per foundation surface area of 2,512 m², with a total area of 175,850 m²; • Six small OSS on GBS (Box-type) foundations, each with a length and width of 75 m at seabed level and at Lowest Astronomical Tide (LAT). Average water depth of 47.5 m, giving a per-foundation surface area of 14,250 m², with a total area of 85,500 m²; • Three large OSS on GBS (Box-type) foundations, each with a length and width of 150 m at seabed level and at LAT. Average water depth of 47.5 m, giving a per-foundation surface area of 28,500 m², with a total area of 85,500 m²; • One accommodation platform on a GBS (Box-type) foundation (small OSS), with a length and width of 75 m at seabed level and at LAT. Average water depth of 47.5 m, giving a total surface area of 14,250 m²; and • Three HVAC booster stations on GBS (Box-type) foundations (small OSS), each with a length and width of 75 m at seabed level and at LAT. Average water depth of 51 m in the HVAC Booster Station Search Area, giving a per-foundation surface area of 15,300 m², with a total area of 45,900 m².	Defined by the maximum area of structures, scour protection, cable protection and cable crossings introduced to the water column, including surface area of vertical structures. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co83 Co201	**No likely significant effect** No likely significant effect predicted on the basis that any effects will be limited to the immediate vicinity of the turbine locations and will not result in significant change to the local or regional fish and shellfish populations.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.6).	Minor	High	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Negligible to Minor	Low to High	**No significant effect (Not Significant to Slight Adverse)**
FSE-O-8	Array area	Operation	Underwater noise as a result of operational turbines.	N/A as not considered in detail in the ES.	This results in the maximum potential for noise disturbance on fish and shellfish receptors during the operation and maintenance phase.	N/A	**No likely significant effect** No likely significant effect predicted on the basis that noise levels will only be detected in very close proximity to the operational turbines (as evidenced by monitoring) and the routine presence of fish and shellfish in close proximity to operational turbines.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.7).	Negligible	N/A	**No significant effect (Not Significant)**	**Not considered in detail in the ES**	Assessed at PEIR as no Likely Significant Effect (LSE) and confirmed no change to either magnitude or sensitivity of the species and therefore not considered further in the EIA. Noise levels will only be detected in very close proximity to the operational turbines (as evidenced by monitoring (Volume A4, Annex 4.4: Subsea Noise Technical Report) and the routine presence of fish and shellfish in close proximity to operational turbines.	N/A	N/A	**No significant effect**
FSE-O-9	All-offshore	Operation	EMF effects arising from cables.	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effect** No likely significant effect predicted on the basis that EMFs will only be detectable in close proximity to the cable infrastructure and will therefore have a restricted spatial extent and the adoption of embedded mitigation compliant with the relevant mitigation set out in ADS EM-3).	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.8). The spatial extent of EMFs will be limited to the immediate vicinity of the cable, and where possible cable burial will be the preferred option for cable protection (Co83).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect#**
FSE-O-10	All-offshore	Operation	Direct disturbance resulting from maintenance during operation.	**Direct disturbance to seabed from jack-up vessels and cable maintenance activities = 8,579,812 m².** **WTG O&M activities – jack up operations:** • Component replacement = 378,000 m²; • Access ladder replacement = 378,000 m²; • Foundation anode replacement = 378,000 m²; and • J-Tube repair/ replacement = 108,000 m². **Array cable activities:** • Remedial burial of array cables (42 km total length reburied) = 4,200,000 m²; • Array cable repairs = 363,736 m²; and • Cable protection replacement = 156,000 m². **OSS and accommodation platform activities:** • OSS component replacement = 6,000 m²; • Access ladder replacement = 90,000 m²; • Foundation anode replacement = 21,000 m²; and • J-Tube repair/ replacement = 6,000 m². **Offshore export cable activities:** • Remedial burial of export cables (1.4 km total length reburied) = 1,400,000 m²; • Export cable repairs = 153,548 m²; and • Cable protection replacement = 198,000 m². **Interconnector cable activities:** • Remedial burial of interconnector cables (7 km total length reburied) = 700,000 m²; • Interconnector cable repairs = 20,028 m²; and • Cable protection replacement = 23,500 m².	Defined by the maximum number of jack-up vessel operations and maintenance activities that could have an interaction with the seabed anticipated during operation.	Primary: Co2 Co44 Co45 Co83	**No likely significant effect** No likely significant effect predicted on the basis that any impacts will be of limited spatial extent and will be short term in nature.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.9).	N/A	N/A	**No significant effect**	**Simple Assessment**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.9). Impact re-considered in the ES following the addition of gravity base foundations and responses to Section 42 consultation.	Negligible to Minor	Low to High	**No significant effect (Not Significant to Slight Adverse)**
FSE-O-11	All-offshore	Operation	Indirect disturbance resulting from the accidental release of pollutants.	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effect** No likely significant effect with embedded mitigation which will act to prevent or control pollution events.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.10). Accidental release of pollutants will be managed and mitigated through implementation of a CPEMMP (Co1.1.1), which will include details of a Marine Pollution Contingency Plan to address the risks, methods and procedures to deal with any spills and collision incidents of the authorised project in relation to all activities carried out below MHWS.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
FSE-O-12	All-offshore	Operation	Potentially reduced fishing pressure within the Hornsea Four array area an increased fishing pressure outside the array area due to displacement.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	N/A	**No likely significant effect** No likely significant effect predicted on the basis that exclusion of fishing activity will be spatially restricted to safety zones in the immediate vicinity of the turbine infrastructure. In addition, effects resulting from this impact are likely to be positive for local fish and shellfish populations.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.11).	Negligible	N/A	**No significant effect (Not Significant)**	**Not considered in detail in the ES**	Assessed at PEIR as no Likely Significant Effect (LSE) and confirmed no change to either magnitude or sensitivity of the species and therefore not considered further in the EIA. The exclusion of fishing activity will be spatially restricted to safety zones in the immediate vicinity of the turbine infrastructure, and therefore any potential for fishing pressure displacement will be minimal.	N/A	N/A	**No significant effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
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FSE-D-13	All-offshore	Decomissioning	Direct damage (e.g. crushing) and disturbance to mobile demersal and pelagic fish and shellfish species arising from decommissioning activities.	MDS is identical (or less) to that of the construction phase (FSE-C-1). **Total area of direct disturbance = 75,895,509 m^2**	MDS is assumed to be similar to the construction phase, with all infrastructure removed in reverse-construction order. The removal of cables and rock protection is considered the MDS, however the necessity to remove cables and rock protection will be reviewed at the time of decommissioning.	Primary: Co2 Co44 Co45 Co48 Co84 Co86 Secondary: Co188 Co189 Tertiary: Co181	**No likely significant effect** No likely significant effect predicted on the basis that the impact will be spatially restricted to a small proportion of the seabed within the Hornsea Four array area and ECC.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.12).	N/A	N/A	**No significant effect**	**Simple Assessment**	Scoped back into assessment at request of consultees.	Negligible to Minor	Low to High	**No significant effect (Not Significant to Slight Adverse)**
FSE-D-14	All-offshore	Decomissioning	Temporary localised increases in SSC and smothering.	MDS is identical (or less) to that of the construction phase (FSE-C-2). **Total volume = 12,213,921 m^3**	MDS is assumed to be as per the construction phase, with all infrastructure removed in reverse-construction order. The removal of cables is considered the MDS, however the necessity to remove cables will be reviewed at the time of decommissioning.	Primary: Co2 Co44 Co45 Tertiary: Co181	**No likely significant effect** No likely significant effect predicted on the basis that the species within the array area and offshore ECC have a limited sensitivity to increased SSC which will occur over a limited period/area.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.13).	Minor	High	**No significant effect (Minor Adverse)**	**Simple Assessemt**	Simple assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Minor	Low to High	**No significant effect (Neutral to Slight Adverse)**
FSE-D-15	All-offshore	Decomissioning	Direct and indirect seabed disturbances leading to the release of sediment contaminants.	MDS is identical (or less) to that of the construction phase (FSE-C-3). **Total volume = 12,213,921 m^3**	MDS is assumed to be as per the construction phase, with all infrastructure removed in reverse-construction order. The removal of cables is considered the MDS, however the necessity to remove cables will be reviewed at the time of decommissioning.	Primary: Co2 Co44 Co45 Tertiary: Co181	**No likely significant effect** No likely significant effect predicted on the basis that the species within the array area and offshore ECC have a limited sensitivity to increased SSC which will occur over a limited period/area.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.14).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Negligible	N/A	**No significant effect (Not Significant)**
FSE-D-16	All-offshore	Decomissioning	Mortality, injury, behavioural changes and auditory masking arising from noise and vibration.	Maximum levels of underwater noise during decommissioning would be from underwater cutting required to remove structures. This is much less than pile driving and therefore impacts would be less than as assessed during the construction phase/ piled foundations would likely be cut approximately 1 m below the seabed.	This would result in the maximum potential disturbance associated with noise associated with decommissioning activities including foundation decommissioning.	Tertiary: Co2 Co113 Co181	**No likely significant effect** No likely significant effect predicted on the basis that noise from decommissioning activities will be limited temporally and will not propagate over a large spatial footprint.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.15).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessemt**	Simple assessment at PEIR concluded No LSE. Change in baseline data/assessment methodology and/or Project description. Assessment rerun and included in ES.	Negligible	N/A	**No significant effect (Not Significant)**
FSE-D-17	All-offshore	Decomissioning	Accidental pollution events during the decommissioning phase resulting in potential effects on fish and shellfish receptors.	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effect** No likely significant effect with embedded mitigation which will act to prevent or control pollution events.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.4.16). Accidental release of pollutants will be managed and mitigated through implementation of a CPEMMP (Co1.1.1), which will include details of a Marine Pollution Contingency Plan to address the risks, methods and procedures to deal with any spills and collision incidents of the authorised project in relation to all activities carried out below MHWS	N/A	N/A	**No significant effect**	**Scoped Out**	N/A	N/A	N/A	**No significant effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
MM-C-1	Array Area	Construction	PTS (auditory injury) from piling noise.	**Spatial MDS:** • 180 Wind Turbine Generators (WTGs) on monopile foundations; • Six small and three large Offshore Substations (OSS) on monopile foundations; • One accommodation platform on a monopile foundation; • 3 High Voltage Alternating Current (HVAC) Booster Stations (small OSS) on monopile foundations; • Maximum design: 5,000 kJ hammer energy, 4.4 hours piling duration including a 30 min soft start and 22.5 min ramp up; • Most likely: 4,000 kJ hammer energy, 2.1 hours piling duration including a 30 min soft start and 22.5 min ramp up; • Total WTG piling days: 216 assuming 1.2 days per monopile over a 12 month piling period; • Total non-WTG piling days: 16 assuming 1.2 days per monopile over a 12 month piling period; and • Simultaneous piling: only two piles will be piled simultaneously within the Hornsea Four array area. **Temporal MDS:** • 180 WTGs on piled jacket (WTG-type) foundations, 3 piles per jacket (540 total); • Six small OSS on piled jacket (small OSS) foundations and three large OSS on piled jacket (large OSS) foundations (144 total piles); • One accommodation platform on a piled jacket (small OSS) foundation (16 total piles); • Three HVAC Booster Stations on piled jacket (small OSS) foundations (48 total piles); • Maximum design: 3,000 kJ hammer energy, 4.4 hours piling duration including a 30 min soft start and 22.5 min ramp up; • Most likely: 1,750 kJ hammer energy, 2.1 hours piling duration including a 30 min soft start and 22.5 min ramp up; • Total WTG piling days: 270 assuming 1.5 days per jacket foundation over a 12 month piling period; • Total non-WTG piling days: 39 assuming 3 days per jacket foundation over a 12 month piling period; and • Simultaneous piling: only two piles will be piled simultaneously within the Hornsea Four array area.	The piling scenario with the largest PTS impact ranges represent the maximum design scenario. This differs between species depending on the frequency characteristics emitted during installation of each pile type and the hearing of the species (e.g. for high frequency cetaceans such as harbour porpoise, pin piles have a larger PTS impact range whereas for low frequency cetaceans, monopiles have a larger PTS impact range). The maximum number of piled foundations would represent the temporal maximum design scenario for disturbance. The maximum predicted impact range for underwater noise for piled foundations would represent the spatial maximum design scenario for disturbance. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co85 Tertiary: Co110	**Likely significant effect without secondary mitigation** Recent expert elicitation for PTS as a result of pile driving resulted in agreement between experts that the predicted PTS effects from exposure to piling noise (defined as 6 dB PTS in the 2-10 kHz band) was unlikely to have a large effect on the survival or reproduction of the species of interest.	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID:4.5.9).	Negligible	N/A	**No significant effect (Not significant to minor adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as detailed assessment.	Negligible	N/A	**No significant effect (Not significant to slight adverse)**
MM-C-2	Array Area	Construction	Disturbance from piling noise.	As per MDS for MM-C-1.	As per MDS for MM-C-1.	Primary: Co85 Tertiary: Co110	**Likely significant effect without secondary mitigation** Evidence from telemetry and acoustic detection data at previous offshore wind farms show animals are displaced during piling but return after piling ceases.	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.9).	Harbour porpoise: Minor Grey seal: Minor Minke whale, white-beaked dolphin, harbour seal: Negligible	Harbour porpoise: Medium Grey seal: Low Minke whale, white-beaked dolphin, harbour seal: N/A	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as detailed assessment.	Harbour porpoise: Minor Grey seal: Minor Minke whale, white-beaked dolphin, bottlenose dolphin, harbour seal: Negligible	Harbour porpoise: Medium Grey seal: Low Minke whale, white-beaked dolphin, bottlenose dolphin, harbour seal: N/A	**No significant effect (Not Significant to Slight)**
MM-C-3	Array Area	Construction	TTS from piling noise.	As per MDS for MM-C-1.	As per MDS for MM-C-1.	Primary: Co85 Tertiary: Co110	**No Likely Significant Effect** Since there are no thresholds to determine a biologically significant effect from TTS and given that disturbance will be included in a detailed quantitative assessment, the impact of TTS on marine mammals was scoped out of assessment.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.1). There are no thresholds to determine a biologically significant effect from TTS, therefore no assessment of the number of animals, magnitude, sensitivity or significance of effect is given.	Not Assessed	Not Assessed	**No significant effect**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment. Full details of the underwater noise modelling and the resulting TTS impact areas and ranges are detailed in Volume 4, Annex 4.5: Subsea Noise Technical Report, and the table of ranges has now also been included within the Marine Mammals chapter. There are no thresholds to determine a biologically significant effect from TTS, therefore no assessment of the number of animals, magnitude, sensitivity or significance of effect is given. This approach was agreed with Consultees at Evidence Plan Technical Meeting 4 (30 April 2019).	Not Assessed	Not Assessed	**No significant effect**
MM-C-4	Array Area	Construction	Vessel collision risk.	**Wind Turbine Foundation Installation:** • Up to 2,880 return trips over a 12-month period. **Wind Turbine Installation:** • Up to 900 return trips over a 24-month period. **OSS Installation (all OSSs and the accommodation platform):** • Up to 270 return trips over a two-month period. **OSS Foundation Installation (all OSSs and the accommodation platform):** • Up to 180 return trips over a two-month period. **Inter-Array and Interconnector Cable Installation:** • Up to 1,488 return trips over a 24-month period. **Offshore Export Cable Installation:** • Up to 408 return trips over a 24-month period. **Total:** • Up to 8 vessels in any given 5 km^2 at any one time.	The maximum numbers of vessels and associated vessel movements represents the maximum potential for collision risk and disturbance.	Tertiary: Co108 Co111	**Likely significant effect without secondary mitigation** It is not expected that there will be a significant increase in vessel activity over the baseline levels.	**Simple Assessment**	Scoped into assessment based on the Applicant's position at scoping and no comments received in Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor	Medium	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Minor	High	**No significant effect (Slight)**
MM-C-5	Array Area	Construction	Disturbance from vessels.	The MDS for maximum number of vessels is presented in MM-C-4.	As per MDS for MM-C-4.	Tertiary: Co108 Co111	**Likely significant effect without secondary mitigation** It is not expected that there will be a significant increase in vessel activity over the baseline levels.	**Simple Assessment**	Scoped into assessment based on the Applicant's position at scoping and no comments received in Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor	Low	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Minor	Low	**No significant effect (Slight)**
MM-C-6	Array Area	Construction	Reduction in prey availability.	Maximum effect on fish prey species as detailed in the assessment in Volume A2, Chapter 3: Fish and Shellfish Ecology.	Assessment based on the MDS presented in Volume A2, Chapter 3: Fish and Shellfish Ecology.	None	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.3).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
MM-C-7	Array Area	Construction	Reduction in foraging ability.	**Total volume 12,192,331 m³** **WTG Foundations:** • 110 turbines on Gravity Base Structure (GBS) (WTG type) foundations requiring seabed preparation, resulting in the suspension of 685,794 m³ of sediment; and • 70 Suction Caisson Jacket (WTG type) foundations requiring seabed preparation, resulting in the suspension of 359,427 m³ of sediment. **OSS Foundations (array):** • Six OSS on suction caisson jacket (small OSS) foundations and three OSS on GBS (large OSS) foundations requiring seabed preparation, resulting in the suspension of 737,130 m³ of sediment. **Offshore Accommodation Platform Foundations:** • One suction caisson jacket (small OSS) foundation requiring seabed preparation, resulting in the suspension of 57,245 m³ of sediment. **High Voltage Alternating Current (HVAC) Booster Station Foundations:** • Three suction caisson jacket (small OSS) foundations requiring seabed preparation, resulting in the suspension of 171,735 m³ of sediment. **Sandwave Clearance:** • Sandwave clearance for 600 km of array cables resulting in the suspension of 769,000 m³ of sediment; • Sandwave clearance for 90 km of interconnector cables resulting in the suspension of 115,000 m³ of sediment; and • Sandwave clearance for 654 km of export cables resulting in the suspension of 834,000 m³ of sediment. **Cable Trenching:** • Installation of 600 km of array cables by Controlled Flow Excavation (CFE) resulting in the suspension of 3,600,000 m³ of sediment; • Installation of 90 km of interconnector cables resulting in the suspension of 540,000 m³ of sediment; • Installation of six export cables by CFE resulting in the suspension of 3,903,000 m³ of sediment (excluding the part of the export cable within the array); and • Up to 420,000 m³ of sediment from up to four cable joints per export cable in the ECC.	The MDS for foundation installation results from the largest volume suspended from seabed preparation (GBS and suction caisson jacket foundations). For cable installation, the MDS results from the greatest volume from sandwave clearance and installation using energetic means (CFE). This also assumes the largest number of cables and the greatest burial depth. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten a+F12nd three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co201	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.4).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No significant effect (not significant)**
MM-C-8	Array Area	Construction	Toxic contamination.	N/A as scoped out.	N/A as scoped out.	Tertiary: Co111	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.5). A commitment has been made to a Marine Pollution Contingency Plan (MPCP) which will include measures to be adopted for the prevention of pollution events and outline an emergency plan to be implemented in the unlikely event of any pollution events (see Co111 of Volume A4, Annex 5.2 Commitments Register).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as Scoped Out.	N/A	N/A	**No significant effect**
MM-C-9	All-offshore	Construction	Non-piling noise (e.g. cable laying, dredging).	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	N/A	**Likely significant effect without secondary mitigation** It is unlikely that these activities will impact marine mammal receptors at anything other than the immediate proximity.	**Simple Assessment**	Scoped into assessment based on the Applicant's position at scoping and no comments received in Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (not significant)**	**Not considered further in the EIA**	Simple assessment at PEIR with conclusion of no likely significant effect (LSE) and confirmed no change to either magnitude or sensitivity of the species. The underwater noise impacts from non-piling noise will be significantly less than that of impact piling and will be very local and short term. Any potential displacement will be temporary and therefore unlikely to significantly affect marine mammal vital rates.	N/A	N/A	**No significant effect**
MM-C-10	Landfall	Construction	Disturbance to seal haul-outs.	N/A as scoped out.	N/A as scoped out.	Tertiary: cO111	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Scoped Out**	Impact not identified at EIA Scoping. Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID:4.5.7). There are no grey or harbour seal haul-outs sites in the vicinity of the land-fall site based on the SMRU August haul-out count surveys, and there is no evidence from the at-sea and total usage maps or the available telemetry data that harbour seals use the landfall area in any significant numbers (see Volume A5, Annex 4.1: Marine Mammal Technical Report).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as Scoped Out.	N/A	N/A	**No significant effect**
MM-C-11	All-offshore	Construction	PTS from UXO clearance.	**UXO Clearance:** • Estimated 2,263 targets; • 86 UXOs may require clearance; and • Up to five UXO could be detonated per day.	Estimated maximum design based on data from other projects in the Hornsea Zone. A detailed UXO survey would be completed prior to construction. The type, size (net explosive quantities (NEQ)) and number of possible detonations and duration of UXO clearance operations is therefore not known at this stage.	None	**Likely significant effect without secondary mitigation** Magnitude depends on charge size which is currently unknown. Hornsea Three predicted Negligible-Low magnitude impacts of PTS for charge sizes up to 260 kg	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.9).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No significant effect (not significant)**
MM-C-12	All-offshore	Construction	Disturbance from UXO clearance.	The MDS for maximum UXO disturbance is presented in MM-C-11.	As per MDS for MM-C-11.	None	**Likely significant effect without secondary mitigation** In the absence of empirical data on the likelihood of response to explosives the assessment will involve the application of a 26 km buffer around a UXO source location to determine the number of animals predicted to be disturbed.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.9).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Harbour porpoise, bottlenose dolphin, Harbour seal: Minor Grey seal: Moderate Minke whale, white-beaked dolphin : Negligible	Harbour porpoise, bottlenose dolphin, Harbour seal: Medium Grey seal: Low Minke whale, white-beaked dolphin : N/A	**No significant effect (Not Significant to Slight)**
MM-C-13	Array Area	Construction	TTS from UXO clearance.	As per MDS for MM-C-11.	As per MDS for MM-C-11.	None	**No Likely Significant Effect** Since there are no thresholds to determine a biologically significant effect from TTS and given that disturbance will be included in a detailed quantitative assessment, the impact of TTS on marine mammals was scoped out of	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID:4.5.1). There are no thresholds to determine a biologically significant effect from TTS, therefore no assessment of the number of animals, magnitude, sensitivity or significance of effect is given.	Not Assessed	Not Assessed	**No significant effect**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment. There are no thresholds to determine a biologically significant effect from TTS, therefore no assessment of the number of animals, magnitude, sensitivity or significance of effect is given. This approach was agreed with Consultees at Evidence Plan Technical Meeting 4 (30 April 2019).	Not Assessed	Not Assessed	**No significant effect**

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MM-O-14	Array Area	Operation	Operational noise.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	N/A	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.2).	Minor	Low	**No significant effect (Not Significant)**	**Not considered further in the EIA**	Simple assessment at PEIR with conclusion of no LSE and confirmed no change to either magnitude or sensitivity of the species. Using the non-impulsive weighted SELcum PTS and TTS thresholds from Southall et al. (2019) resulted in estimated PTS and TTS impact ranges of <100 m for all marine mammal species. Given the evidence of their presence in and around existing operational offshore wind farms, marine mammals are deemed to be of low vulnerability and have high recoverability to the impact of operational noise. The EP Technical Panel agreed that there is no need for the operational noise assessment to consider anything other than noise related to vessel traffic. (ORE-MM-17-2).	N/A	N/A	**No significant effect**
MM-O-28	Array Area	Operation	Vessel collision risk.	• Up to 1,205 crew vessel return trips per year • Up to 124 jack-up vessel return trips per year • Up to 104 supply vessel return trips per year **Total Trips:** • Up to 1,433 return trips per year	The maximum numbers of vessels and associated vessel movements represents the maximum potential for collision risk.	Tertiary: Co108 cO111	**Likely significant effect without secondary mitigation** It is not expected that there will be a significant increase in vessel activity over the baseline levels.	**Simple Assessment**	Scoped into assessment based on the Applicant's position at scoping and no comments received in Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor	Medium	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Minor	High	**No significant effect (Slight)**
MM-O-15	Array Area	Operation	Disturbance from vessels	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	N/A	**Likely significant effect without secondary mitigation** It is not expected that there will be a significant increase in vessel activity over the baseline levels.	**Simple Assessment**	Scoped into assessment based on the Applicant's position at scoping and no comments received in Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor	Low	**No significant effect (Minor Adverse)**	**Not considered further in the EIA**	Simple assessment at PEIR with conclusion of no LSE and confirmed no change to either magnitude or sensitivity of the species. It is not expected that the level of vessel activity during the O&M of Hornsea Four would cause a significant increase in the risk of disturbance by vessels. The adoption of a Vessel Management Plan (VMP) (Co108 of Volume A4, Annex 5.2 Commitments Register) that includes preferred transit routes and guidance for vessel operations in the vicinity of marine mammals and around seal haul-outs will minimise the potential for any impact.	N/A	N/A	**No significant effect**
MM-O-16	Array Area	Operation	Reduction in prey availability.	Maximum effect on fish prey species as detailed in the assessment in Volume A2, Chapter 3: Fish and Shellfish Ecology.	Assessment based on the MDS presented in Volume A2, Chapter 3: Fish and Shellfish Ecology.	None	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.3).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as detailed assessment.	Negligible	N/A	**No significant effect (not significant)**
MM-O-17	Array Area	Operation	Reduction in foraging ability.	**Array Cable Activities:** • Remedial burial of array cable (42 km total length reburied) by CFE – 252,000 m^3; and • Array cable repairs = 218,258 m^3. **Interconnector Cable Activities:** • Remedial burial of interconnector cables (7 km total length reburied) by CFE = 42,000 m^3; and • Interconnector cable repairs = 11,153 m^3. **Export Cable Activities:** • Remedial burial of export cables (14 km total length reburied) by CFE = 84,000 m^3; and • Export cable repairs = 85,505 m^3. **Total volume 693,916 m^3**	The maximum impacts from remedial cable burial and cable repairs of array, interconnector and export cables result from the use of CFE. This assumes the largest number of cables, repair events, the greatest burial depth and greatest length/area of maintenance. This results in the maximum sediment volume disturbance.	None	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.4).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as detailed assessment.	Negligible	N/A	**No significant effect (not significant)**
MM-O-18	Array Area	Operation	Toxic contamination.	N/A as scoped out.	N/A as scoped out.	Tertiary: Co111	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Scoped Out**	Impact not identified at EIA Scoping. Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.5). A commitment has been made to a MPCP which will include measures to be adopted for the prevention of pollution events and outline an emergency plan to be implemented in the unlikely event of any pollution events (see Co111 of Volume A4, Annex 5.2 Commitments Register).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as Scoped Out.	N/A	N/A	**No significant effect**
MM-O-19	Array Area	Operation	EMF.	N/A as scoped out.	N/A as scoped out.	N/A	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Scoped Out**	Impact not identified at EIA Scoping. Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.6). Based on the data available to date, there is no evidence of EMF related to marine renewable devices having any impact (either positive or negative) on marine mammals (Copping 2018).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as Scoped Out.	N/A	N/A	**No significant effect**
MM-D-20	Array Area	Decomissioning	PTS from underwater noise.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Tertiary: Co113	**Likely significant effect without secondary mitigation** Depends on the method used to remove structures. Methods such as hot cutting (Brocotorch), diamond wire cutting and abrasive water jet cutting are all expected to have negligible impact due to low noise levels and the temporary nature of the impact.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.9).	Harbour porpoise: Minor Minke whale, white-beaked dolphin, Harbour seal, Grey seal: Negligible	Harbour porpoise: Medium Minke whale, white-beaked dolphin, Harbour seal, Grey seal: N/A	**No significant effect (Not Significant to Minor Adverse)**	**Not considered further in the EIA**	Simple assessment at PEIR with conclusion of no LSE and confirmed no change to either magnitude or sensitivity of the species. The approach and methodologies employed at decommissioning will be compliant with the legislation and policy requirements at the time of decommissioning. It is assumed that the MDS is to be as per construction (with no pile driving), thus the impact is assumed to be similar to the construction phase (or less). A commitment has been made to a Decommissioning MMMP which will include measures to ensure the risk of permanent threshold shift (PTS) to marine mammals is negligible and will be in line with the latest relevant available guidance (see Co113 of Volume A4, Annex 5.2 Commitments Register).	N/A	N/A	**No significant effect**
MM-D-21	Array Area	Decomissioning	Disturbance from underwater noise.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Tertiary: Co113	**Likely significant effect without secondary mitigation** Depends on the method used to remove structures. Methods such as hot cutting (Brocotorch), diamond wire cutting and abrasive water jet cutting are all expected to have negligible impact due to low noise levels and the temporary nature of the impact.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.9).	Harbour porpoise: Minor Grey seal: Minor Minke whale, white-beaked dolphin, Harbour seal: Negligible	Harbour porpoise: Medium Grey seal: Low Minke whale, white-beaked dolphin, Harbour seal: N/A	**No significant effect (Not Significant to Minor Adverse)**	**Not considered further in the EIA**	Simple assessment at PEIR with conclusion of no LSE and confirmed no change to either magnitude or sensitivity of the species. The approach and methodologies employed at decommissioning will be compliant with the legislation and policy requirements at the time of decommissioning. It is assumed that the MDS is to be as per construction (with no pile driving), thus the impact is assumed to be similar to the construction phase (or less). A commitment has been made to a Decommissioning MMMP which will include measures to ensure the risk of permanent threshold shift (PTS) to marine mammals is negligible and will be in line with the latest relevant available guidance (see Co113 of Volume A4, Annex 5.2 Commitments Register).	N/A	N/A	**No significant effect**

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MM-D-22	Array Area	Decomissioning	TTS from underwater noise.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Tertiary: Co113	**No Likely Significant Effect** Since there are no thresholds to determine a biologically significant effect from TTS and given that disturbance will be included in a detailed quantitative assessment, the impact of TTS on marine mammals was scoped out of	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID:4.5.1). There are no thresholds to determine a biologically significant effect from TTS, therefore no assessment of the number of animals, magnitude, sensitivity or significance of effect is given.	Not Assessed	Not Assessed	**No significant effect**	**Not considered further in the EIA**	Simple assessment at PEIR with conclusion of no LSE and confirmed no change to either magnitude or sensitivity of the species. The approach and methodologies employed at decommissioning will be compliant with the legislation and policy requirements at the time of decommissioning (see Co113 of Volume A4, Annex 5.2 Commitments Register). Impact assumed to be similar to the construction phase (or less). No assessment of the significance of TTS is provided.	N/A	N/A	**No significant effect**
MM-D-23	Array Area	Decomissioning	Vessel collision risk.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Tertiary: Co111	**Likely significant effect without secondary mitigation** It is not expected that there will be a significant increase in vessel activity over the baseline levels.	**Simple Assessment**	Scoped into assessment based on the Applicant's position at scoping and no comments received in Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor	Medium	**No significant effect (Minor Adverse)**	**Not considered further in the EIA**	Simple assessment at PEIR with conclusion of no LSE and confirmed no change to either magnitude or sensitivity of the species. The level of vessel activity during the decommissioning phase are predicted to be the same as for the construction period. Therefore, the impact is assumed to be similar to construction phase (or less). The adoption of a VMP (Commitment Co108 of Volume A4, Annex 5.2 Commitments Register) will minimise the potential for any impact	N/A	N/A	**No significant effect**
MM-D-24	All-offshore	Decomissioning	Disturbance from vessels.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Tertiary: Co111	**Likely significant effect without secondary mitigation** It is not expected that there will be a significant increase in vessel activity over the baseline levels.	**Simple Assessment**	Scoped into assessment based on the Applicant's position at scoping and no comments received in Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor	Low	**No significant effect (Minor Adverse)**	**Not considered further in the EIA**	Simple assessment at PEIR with conclusion of no LSE and confirmed no change to either magnitude or sensitivity of the species. The level of vessel activity during the decommissioning phase are predicted to be the same as for the construction period. Therefore, the impact is assumed to be similar to construction phase (or less). The adoption of a VMP (Commitment Co108 of Volume A4, Annex 5.2 Commitments Register) will minimise the potential for any impact	N/A	N/A	**No significant effect**
MM-D-25	Landfall	Decomissioning	Reduction in prey availability.	Maximum effect on fish prey species as detailed in the assessment in Volume A2, Chapter 3: Fish and Shellfish Ecology.	Assessment based on the MDS presented in Volume A2, Chapter 3: Fish and Shellfish Ecology.	Tertiary: Co181	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.3).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as detailed assessment.	Negligible	N/A	**No significant effect (not significant)**
MM-D-26	All-offshore	Decomissioning	Reduction in foraging ability.	MDS is identical (or less) to that of the construction phase (MM-C-7). **Total volume = 12,192,331 m³**	MDS is assumed to be as per the construction phase, with all infrastructure removed in reverse-construction order. The removal of cables is considered the MDS, however the necessity to remove cables will be reviewed at the time of decommissioning.	Tertiary: Co181	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.4).	Negligible	N/A	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as detailed assessment.	Negligible	N/A	**No significant effect (not significant)**
MM-D-27	Array Area	Decomissioning	Toxic contamination.	N/A as scoped out.	N/A as scoped out.	Tertiary: Co111	**No Likely Significant Effect** No adverse impact was expected and so this impact was scoped out of further assessment.	**Scoped Out**	Impact not identified at EIA Scoping. Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.5.5). A commitment has been made to a MPCP which will include measures to be adopted for the prevention of pollution events and outline an emergency plan to be implemented in the unlikely event of any pollution events (see Co111 of Volume A4, Annex 5.2 Commitments Register).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as Scoped Out.	N/A	N/A	**No significant effect**

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ORN-C-1	Array Area	Construction	Construction activities within the array area associated with foundations and WTGs may lead to disturbance and displacement of species within the array and different degrees of buffers surrounding it.	**Construction Vessels / Helicopters within Array Area:** • Up to eight construction vessels in a given 5 km^2 area with approximately three or four 5 km2 areas at any one time. • Single phase of offshore construction over approximately 3 years. **WTG Installation:** • Up to two installation vessels (Jack Up Vessels (JUV) or anchored) (90 return trips); • Up to 12 support vessels (270 return trips); • Up to 24 transport vessels (540 return trips); and • Up to 135 helicopter return trips. **WTG Foundation Installation:** • 6 installation vessels (2 anchored or 4DP2 or 6 x Tugs) (90 return trips if anchored or DP2. 540 return trips if Tugs); • 19 support vessels (900 return trips); • 40 transport/feeder vessels (including tugs) (720 return trips); • 12 dredging vessels (720 return trips); and • 180 helicopter return trips. **OSS and Accommodation Platform Installation:** • 2 installation vessels (36 return trips); • 12 support vessels (162 return trips); • 4 transport/feeder vessels (72 return trips); and • 63 helicopter return trips. **OSS and Accommodation Platform Foundation Installation:** • 2 installation vessels (24 return trips); • 12 support vessels (108 return trips); • 4 transport/feeder vessels (48 return trips); and • 42 helicopter return trips. **Array and Interconnector Cable Installation:** • 3 main cable laying vessels (204 return trips); • 3 main cable burial vessels (204 return trips); • 12 support vessels (1,080 return trips); and • 396 helicopter return trips.	The maximum estimated number of development areas within the array area with vessels operating concurrently would cause the greatest disturbance to birds on site.	Primary: Co2 Co87 Tertiary: Co88	**Likely significant effect without secondary mitigation** LSE likely to be not significant to minor depending on species assessed. This is due to any potential impacts being minimised spatially to a small number of foundations and / or WTGs at any one time and temporally due to the construction phase being limited in time.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**
ORN-C-2	All-offshore	Construction	Indirect impacts during the construction phase within the array area through effects on habitats and prey species	See MDS for Fish and Shellfish Ecology assessment (**Volume A2, Chapter 3: Fish and Shellfish Ecology**) and for the Benthic and Intertidal Ecology assessment (**Volume A2, Chapter 2: Benthic and Intertidal Ecology**).	Indirect effects on birds could occur through changes to any of the species and habitats considered within the Fish and Shellfish Ecology or Benthic and Intertidal Ecology assessments. The maximum indirect impact on birds would result from the maximum direct impact on fish, shellfish and benthic species and habitats. The maximum design scenario is therefore as per justifications in **Volume A2, Chapter 3: Fish and Shellfish Ecology** and **Volume A2, Chapter 2: Benthic and Intertidal Ecology**.	N/A	**No likely significant effect** Although the importance of a species linked to a designated site would infer a high score, no OWF EIA submitted to date has predicted a significant impact from this source on birds.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.6.1).	Not Applicable	Not Applicable	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in baseline data of Fish & Shellfish Ecology hence reassessed in ES.	Negligible	N/A	**No significant effect (Not Significant)**
ORN-C-3	ECC	Construction	Construction activities associated with export cable laying may lead to disturbance and displacement of species within the export cable corridor and different degrees of buffers surrounding it.	**Construction vessels within ECC:** • 3 cable laying vessels (96 return trips) • 3 cable jointing vessels (72 return trips) • 3 cable burial vessels (96 return tips) • 15 support vessels (144 return trips) • 800 helicopter return trips	The assumption is that the vessel would be in situ from start to finish, so any disturbance events would be throughout entire period.	Primary: Co2 Co86 Tertiary: Co88	**Likely significant effect without secondary mitigation** LSE likely to be not significant to minor depending on species assessed. This is due to any potential impacts being minimised spatially to a single cable laying vessel and temporally due to the construction phase being limited in time. Also, the most sensitive species (divers) are not found in high densities within study area.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**
ORN-C-4	Landfall	Construction	Construction activities associated with trenching, laying and reburial of the export cable through the intertidal zone may lead to disturbance and displacement of waterbird species in close proximity to the works.	**Horizontal Directional Drilling (HDD) Installation:** • Eight offshore HDD exits pits; • Minimum 6 m entry pit and 5m exit pit depth; • Small 4x4 vehicles related to emergency response on the beach; and • Small 4x4 on beach to monitor the drill head using handheld equipment. **Cable Laying:** • Maximum duration of cable laying via HDD is 24 months within a 32 month period.	The assumption is that the process would be undertaken by HDD methods, so no open trenching, cable laying and burial of the export cable would be required. Therefore, MDS activities to be assessed are limited, though they are to take place over a maximum of 24 months within a 32 month period (allowing for up to six months of weather-related downtime).	Primary: Co2 Co86 Co187	**Likely significant effect without secondary mitigation** LSE is not significant, as very few waterbirds reside within the intertidal area and most species are tolerant of disturbance activities that are limited spatially and temporally	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible/Minor	Low	**No significant effect (Not Significant to Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**
ORN-O-5	Array Area	Operation	Operational activities associated with moving turbines and maintenance vessels may lead to disturbance and displacement of species within the array area and different degrees of buffers surrounding it.	**Array Area:** • WTG deployment across the full array area (468 km^2). **Wind Turbine Generators:** • Up to 180 WTGs; • Minimum height of lowest blade tip above MSL: 40 m; and • Maximum rotor blade radius: 152.5 m. **Operation and Maintenance:** • 2,580 return visits to wind turbines per year; • 780 return visits to wind turbine foundations per year; • 65 return visits to offshore platforms (structural scope) per year; • 100 return visits to offshore platforms (electrical scope) per year; • A total of 3,525 total trips per year completed by helicopter and / or vessels; and • Vessels include: CTVs, service operation vessels, supply vessels, cable and remedial protection vessels, and JUVs.	Displacement would be assumed from the entire array area that contains WTGs and other associated structures, which maximises the potential for disturbance and displacement. Assessment of extent / varying displacement from array area and a buffer is species specific due to their sensitivity levels.	Primary: Co2 Co87 Co138 Tertiary: Co88	**Likely significant effect without secondary mitigation** LSE likely to be not significant to minor/moderate depending on species assessed.	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Medium to High	**No significant effect (not significant to Minor Adverse)**	**Detailed Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as detailed assessment.	Negligible	N/A	**No LSE (Not Significant)**
ORN-O-6	Array Area	Operation	Seabirds flying through the array area during the operational phase are at risk of collision with WTG rotors and associated infrastructure.	**Array Area:** • WTG deployment across the full array area (468 km^2). **Wind Turbine Generators:** • Up to 180 WTGs; • Minimum height of lowest blade tip above MSL: 40 m; and • Maximum rotor blade radius: 152.5 m.	This represents the maximum number of the largest WTGs, which represents the greatest total swept area to be considered for collision risk.	Primary: Co2 Co87 Co138	**Likely significant effect without secondary mitigation** LSE likely to be between not significant and moderate / major, as initial consideration of collision risk highlighted as key consideration for the Hornsea Four project. Risk resulting from in-combination effects with other OWFs is greatest.	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (Not Significant)**	**Detailed Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as detailed assessment.	Negligible	N/A	**No significant effect (Not Significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
ORN-O-7	Array Area	Operation	Migrant non-seabirds flying through the array area during the operational phase are at risk of collision with WTG rotors and associated infrastructure.	**Array Area:** • WTG deployment across the full array area (468 km^2). **Wind Turbine Generators:** • Up to 180 WTGs; • Minimum height of lowest blade tip above MSL: 40 m; and • Maximum rotor blade radius: 152.5 m.	This represents the maximum number of the largest WTGs, which represents the greatest total swept area to be considered for collision risk.	Primary: Co2 Co87 Co138	**Likely significant effect without secondary mitigation** LSE likely to be not significant or minor as previous impact assessments conducted for OWFs in the North Sea have concluded negligible or minor. There are no reasons why this project would be deemed any different.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (Not Significant)**	**Detailed Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**
ORN-O-8	Array Area	Operation	Indirect impacts within the array area during the operational phase through effects on habitats and prey species.	See MDS for Fish and Shellfish Ecology assessment (**Volume A2, Chapter 3: Fish and Shellfish Ecology**) and for the Benthic and Intertidal Ecology assessment (**Volume A2, Chapter 2: Benthic and Intertidal Ecology**).	Indirect effects on birds could occur through changes to any of the species and habitats considered within the Fish and Shellfish Ecology or Benthic and Intertidal Ecology assessments. The maximum indirect impact on birds would result from the maximum direct impact on fish, shellfish and benthic species and habitats. The maximum design scenario is therefore as per justifications in **Volume A2, Chapter 3: Fish and Shellfish Ecology** and **Volume A2, Chapter 2: Benthic and Intertidal Ecology.**	N/A	**No likely significant effect** Although the importance of a species linked to a designated site would infer a high score, no OWF EIA submitted to date has predicted a significant impact from this source on birds.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.6.2).	Not Applicable	Not Applicable	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No LSE (Not Significant)**
ORN-O-9	Array Area	Operation	The presence of WTGs could create a barrier to the migratory or regular foraging movements of seabirds.	**Array Area:** • WTG deployment across the full array area (468 km^2) area; and • Up to 25.6 km north-south extent between the northernmost point of the array area and the southernmost point. **WTGs:** • Up to 180 WTGs.	The measurement would be North to South to define the additional effort required for birds to fly around the array area to the North or South from FFC colony during the breeding if assumed to be commuting to foraging areas beyond array area to the East.	Primary: Co87	**Likely significant effect without secondary mitigation** LSE likely to be not significant to minor. This impact is not widely assessed as being significant and displacement impacts are considered to be the more important focus.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No LSE (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No LSE (Not Significant)**
ORN-O-14	Array Area	Operation	The impact of attraction to lit structures by migrating birds in particular.	**WTGs:** • Up to 180 WTGs; • Minimum height of lowest blade tip above MSL: 40 m; • Maximum rotor blade radius: 152.5 m; • Total array area of 468 km^2; and • Minimum 810 m spacing. **OSS and Accommodation Platforms:** • Up to six offshore transformer substations in the array area; • Up to three offshore High Voltage Direct Current (HVDC) converter substations in the array area; • Up to one offshore accommodation platform in the array area; and • Up to three HVAC booster stations (in the HVAC booster station search area). Lighting outward and not directional on all structures, maximised intensity and range to provide best visibility for aviation and shipping purposes.	Provides the maximum number of structures in the wind farm, with maximum intensity and extent of red and white light sources to increase likelihood that birds will be attracted to structures and become disoriented or more susceptible to collision risk. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co87	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at Scoping stage but assessed at PEIR following consultation with the Evidence Plan Offshore Ornithology Technical Panel.	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Project Description and hence reassessed in ES as simple assessment.	Negligible	N/A	**No significant effect (Not Significant)**
ORN-O-10	ECC	Operation	Potential for ad-hoc maintenance of export cable throughout operational phase may lead to disturbance and displacement of species within the export cable corridor and different degrees of buffers surrounding it.	N/A as scoped out.	N/A as scoped out	N/A	**No likely significant effect** This is unlikely to occur in the first instance. Should it occur then the LSE would be not significant on species assessed, as it would be limited both spatially and temporarily.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.6.4).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as Scoped Out.	N/A	N/A	**No significant effect**
ORN-O-11	Landfall	Operation	Potential for ad-hoc maintenance of export cable through the intertidal zone during the operational phase may lead to disturbance and displacement of waterbird species in close proximity to the works.	N/A as scoped out.	N/A as scoped out	N/A	**No likely significant effect** This is unlikely to occur in the first instance. Should it occur then the LSE would be not significant on species assessed, as it would be limited both spatially and	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.6.5).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as Scoped Out.	N/A	N/A	**No significant effect**
ORN-D-12	ECC	Decomissioning	Demolition activities associated with foundations and WTGs may lead to disturbance and displacement of species within the array area and different degrees of buffers surrounding it.	N/A as scoped out.	N/A as scoped out	Tertiary: Co181	**Likely significant effect without secondary mitigation** LSE likely to be not significant to minor as species are less sensitive to lower scale activities associated with decommissioning	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligble	N/A	**No significant effect (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple assessment at PEIR with conclusion of no significant adverse effect. Not considered in the ES. A degree of temporary disturbance and displacement is likely to occur throughout the decommissioning phase. The long-term effect of this would be to return the area to its former state and the impact on regional or national populations of concern would be not significant over the long term.	N/A	N/A	**No significant effect**
ORN-D-13	ECC/Landfall	Decomissioning	Indirect impacts during the decommissioning phase within the offshore ECC and landfall through effects on habitats and prey species.	See MDS for Fish and Shellfish Ecology assessment (**Volume A2, Chapter 3: Fish and Shellfish Ecology**) and for the Benthic and Intertidal Ecology assessment (**Volume A2, Chapter 2: Benthic and Intertidal Ecology**).	Indirect effects on birds could occur through changes to any of the species and habitats considered within the Fish and Shellfish Ecology or Benthic and Intertidal Ecology assessments. The maximum indirect impact on birds would result from the maximum direct impact on fish, shellfish and benthic species and habitats. The maximum design scenario is therefore as per justifications in **Volume A2, Chapter 3: Fish and Shellfish Ecology** and **Volume A2, Chapter 2: Benthic and Intertidal Ecology.**	Tertiary: Co181	**Likely significant effect without secondary mitigation**	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Not Applicable	Not Applicable	**No significant effect (not significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in baseline data of Fish & Shellfish Ecology hence reassessed in ES.	Negligible	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
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CF-C-1	Array Area	Construction	Hornsea Four array area construction activities and physical presence of constructed wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds.	**Total temporary reduction** **Wind Turbine Generators (WTGs) and platforms:** • Seabed preparation for 110 GBS (Wind Turbine Generator (WTG) type) foundations for WTGs = 411,321 m^2; • Seabed preparation for 70 suction caisson jacket (WTG type) foundations for WTGs = 198,870 m^2. • Seabed preparation for one accommodation platform on a suction caisson jacket (small OSS) foundation = 12,321 m^2; • 500 m exclusion zones around construction activities = 790,000 m^2 per structure under construction at any one time; and • 50 m exclusion zones around incomplete structures = 7,854 m^2 per partially constructed structure at any one time. **Offshore cables:** • Boulder and sandwave clearance for array cables (600 km length, 40 m width) = 24,000,000 m^2; • Burial of array cables (600 km length, 1.5 m width) = 9,000,000 m^2; • Boulder and sandwave clearance for interconnector cables (90 km length, 40 m width) = 3,600,000 m^2; • Burial of interconnector cables (90 km length, 1.5 m width) = 1,350,000 m^2; and • Roaming 500 m safe passing distance for mobile installation vessels, which may, in exceptional circumstances, be increased to 1,000 m dependant on the nature of the installation works. **Construction Duration:** • Offshore construction over approximately a three-year period. **Total permanent reduction** **WTGs and platforms:** • Turbine footprint with scour protection, based on 110 GBS (WTG-type) foundations = 504,540 m^2; • Turbine footprint with scour protection, based on 70 suction caisson jacket (WTG type) foundations = 296,881 m^2. **Offshore platforms:** • Total seabed area for OSS in the array (three large OSS on GBS (large OSS) foundations and six small OSS on GBS (Box-type) foundations, including associated scour protection = 371,250 m^2; and • Total seabed area for one offshore accommodation platform within the array on a small OSS foundation (GBS (Box-type)), including associated scour protection = 30,625 m^2. **Offshore cables:** • Cable protection for array cables = 624,000 m^2; • Cable protection for interconnector cables = 94,000 m^2; and • Pre- and post-lay rock berm area for 32 cables crossings within the array area = 204,000 m^2.	This represents the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential to restrict access to fishing grounds. The construction footprint comprises the full permanent seabed area of structures, scour protection, cable crossings and cable protection (also assessed in CF-O-8) plus the temporary footprint of preparatory works including seabed preparation, sandwave clearance and boulder clearance. The impact also incorporates exclusion zones around major activities. It is important to note that the temporal aspect of temporary works will not apply in full throughout the approximately three-year construction phase, as activities will be completed sequentially. As described in **Volume A4, Annex 4.8: Pro-Rata Annex**, maximum parameters will be delivered on a pro rata basis. For example, the maximum seabed preparation area for WTGs is described for 180 structures, but this would be scaled down to an equivalent value should only 100 structures be built out. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co83 Co85 Co201 Secondary: Co139 Tertiary: Co81 Co89 Co90 Co95 Co99 Co180	**Likely significant effect without secondary mitigation** Effect likely to be of negligible to minor adverse significance, depending on fleet assessed. Potential for some loss of fishing opportunities over construction period, though effect is short-term and localised, and the operational range of fleets is typically not limited to the array area.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Moderate	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Moderate	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-C-2	Offshore Export Cable	Construction	Hornsea Four offshore ECC construction activities leading to reduction in access to, or exclusion from established fishing grounds.	**Total temporary reduction** **Offshore platforms:** • Seabed preparation for three HVAC booster stations on suction caisson jacket (small OSS) foundations within the HVAC Booster Station Search Area = 36,963 m^2; • 500 m exclusion zones around construction activities = 790,000 m^2 per structure under construction at any one time; and • 50 m exclusion zones around incomplete structures = 7,854 m^2 per partially constructed structure at any one time. **Offshore cables:** • Boulder and sandwave clearance for export cables (654 km length, 40 m width) = 26,160,000 m^2; • Burial of export cables (654 km length, 1.5 m width) = 9,810,000 m^2; Cable jointing (four joints per cables, six cables and 3,500 m2 per joint) = 84,000 m^2; and • Roaming 500 m safe passing distance for mobile installation vessels, which may, in exceptional circumstances, be increased to 1,000 m dependant on the nature of the installation works. **Construction Duration:** • Construction over approximately a 4.5 year period, including: • Site preparation works = 28 months; • Platform installation = two months per platform; and • Cable installation = 24 months. **Total permanent reduction** **Offshore platforms:** • Total seabed area for three HVAC booster stations on small OSS GBS (Box-type) foundations within the HVAC Booster Station Search Area, including associated scour protection = 91,875 m^2. **Offshore cables:** • Cable protection for export cables = 792,000 m^2; • Pre- and post-lay rock berm area for 54 cable crossings within the offshore ECC = 344,000 m^2.	This represents the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential to restrict access to fishing grounds. The construction footprint comprises the full permanent seabed area of structures, scour protection, cable crossings and cable protection (also assessed in CF-O-9) plus the temporary footprint of preparatory works including seabed preparation, sandwave clearance and boulder clearance. The impact also incorporates exclusion zones around major activities. It is important to note that the temporal aspect of temporary works will not apply in full throughout the approximately 4.5-year construction phase, as activities will be completed sequentially. As described in **Volume A4, Annex 4.8: Pro-Rata Annex**, maximum parameters will be delivered on a pro rata basis. For example, the maximum seabed preparation area for WTGs is described for 180 structures, but this would be scaled down to an equivalent value should only 100 structures be built out. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co83 Secondary: Co139 Tertiary: Co89 Co90 Co93 Co94 Co95 Co99 Co180	**Likely significant effect without secondary mitigation** Effect likely to be of negligible to minor adverse significance, depending on fleet assessed. Potential for some loss of fishing opportunities over construction period, though effect is short-term and localised, and the operational range of fleets is typically not limited to the offshore ECC.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor to Moderate	Low to Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Minor to Moderate	Low to Medium	**No significant effect (Slight Adverse)**
CF-C-3	Array Area	Construction	Displacement from Hornsea Four array area leading to gear conflict and increased fishing pressure on adjacent grounds.	As per MDS for "Hornsea Four array area construction activities and physical presence of wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds (CF-C-1)".	This represents the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential for displacement.	Primary: Co2 Co83 Co85 Co201 Secondary: Co139 Tertiary: Co89 Co90 Co93 Co94 Co95 Co99	**Likely significant effect without secondary mitigation** Effect likely to be of negligible to minor adverse significance, depending on fleet assessed. Potential for displacement of fishing activity, though effect will be short-term and localised, and the operational range of fleets is typically not limited to the array area.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
CF-C-4	Offshore Export Cable	Construction	Displacement from the Hornsea Four offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds.	As per MDS for "Hornsea Four offshore cable corridor construction activities leading to reduction in access to, or exclusion from established fishing grounds (CF-C-2)".	This represents the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential for displacement.	Primary: Co2 Co83 Secondary: Co139 Tertiary: Co89 Co90 Co93 Co94 Co95 Co99	**Likely significant effect without secondary mitigation** Effect likely to be of negligible to minor adverse significance, depending on fleet assessed. Potential for displacement of fishing activity, though effect will be short-term and localised, and the operational range of fleets is typically not limited to the offshore ECC.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-C-5	All-Offshore	Construction	Hornsea Four array area and offshore ECC construction activities leading to displacement or disruption of commercially important fish and shellfish resources.	See Fish and Shellfish Ecology MDS' presented in Section 3.9 of **Chapter 3: Fish and Shellfish Ecology** (FSE-C-1, FSE-C-2, FSE-C-3, and FSE-C-4).	The scenarios presented in **Chapter 3: Fish and Shellfish Ecology** provide for the greatest disturbance to fish and shellfish species and therefore the greatest knock-on effect to commercial fisheries. Importantly, this considers the impacts as a whole on commercially important species as considered in the MDS' in **Chapter 3: Fish and Shellfish Ecology**, rather than any one impact in particular.	Primary: Co2 Secondary: Co139	**No likely significant effects** Effects of Hornsea Four on species of commercial importance are not expected to be significant in EIA terms and scoped out of further fish and shellfish ecology assessment.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.1.).	Minor	Low to Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Minor	Low to Medium	**No significant effect (Slight Adverse)**
CF-C-6	All-Offshore	Construction	Hornsea Four array area and Hornsea Four offshore ECC construction activities leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the array and offshore ECC areas.	N/A as impact scoped out.	N/A as impact scoped out	Primary: Co2 Secondary: Co139	**No likely significant effects** This effect will be localised and limited deviations to steaming routes are expected. Given adequate notification, it is expected that vessels, which typically have an operational range beyond that the Hornsea Four development area, will be in a position to avoid temporary construction/decommissioning areas and installed infrastructure with no or minimal impact on their steaming times.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.2). Effects are expected to be highly localised and temporary during construction; limited deviations to existing steaming routes are expected. Given adequate notification it is expected that these vessels, which have an operational range beyond that of the development, will be in a position to avoid construction areas with no or minimal effect upon steaming times.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
CF-C-7	All-Offshore	Construction	Increased vessel traffic within fishing grounds as a result of changes to shipping routes and transiting construction vessel traffic from Hornsea Four array area and Hornsea Four offshore ECC leading to interference with fishing activity.	**Wind Turbine Foundation Installation:** • Up to 2,880 return trips over a 12-month period. **Wind Turbine Installation:** • Up to 900 return trips over a 24-month period. **OSS Installation (all OSSs and the accommodation platform):** • Up to 270 return trips over a two-month period. **OSS Foundation Installation (all OSSs and the accommodation platform):** • Up to 180 return trips over a two-month period. **Inter-Array and Interconnector Cable Installation:** • Up to 1,488 return trips over a 24-month period. **Offshore Export Cable Installation:** • Up to 408 return trips over a 24-month period. **Total:** • Up to 8 vessels in any given 5 km^2 at any one time.	The maximum number of turbines and associated infrastructure will lead to the highest level of construction activities and therefore highest level of construction vessel round trips. The maximum number of vessels transits and the maximum duration of the construction would result in the greatest potential for interference.	Tertiary: Co89 Co90 Co93 Co94 Co95 Co99 Co180	**No likely significant effects** Vessel movements associated with Hornsea Four construction, operation and maintenance, and decommissioning, will add to the existing volume of traffic in the area. However, the effect will be localised and given adequate notification, fleets will be able to avoid Hornsea Four vessel traffic.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.3).	Minor	Low to Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Minor	Low to Medium	**No significant effect (Slight Adverse)**
CF-O-8	Array Area	Operation & Maintenance	Physical presence of Hornsea Four array area infrastructure and maintenance activities leading to reduction in access to, or exclusion from established fishing grounds.	**Total permanent reduction** **WTGs and platforms:** • Total seabed area for 1,110 GBS (WTG-type) foundations = 504,540 m^2; • Total seabed area for 70 suction caisson jacket (WTG type) foundations = 296,881 m^2; and • Minimum turbine spacing of 810 m. **Offshore platforms:** • Total seabed area for OSS in the array (three large OSS on GBS (large OSS) foundations and six small OSS on GBS (Box-type) foundations, including associated scour protection = 371,250 m^2; and • Total seabed area for one offshore accommodation platform within the array on a small OSS foundation (GBS (Box-type)), including associated scour protection = 30,625 m^2. **Offshore cables:** • Cable protection for array cables = 624,000 m^2; • Cable protection for interconnector cables = 94,000 m^2; and • Pre- and post-lay rock berm area for 32 cables crossings within the array area = 204,000 m^2. **Temporary reduction from maintenance activities** **WTG O&M Activities:** • Component replacement = 378,000 m^2; • Access ladder replacement = 378,000 m^2; • Foundation anode replacement = 378,000 m^2; and	This represents the maximum duration and extent of fishing exclusion throughout the operation and maintenance phase and hence the greatest potential to restrict access to fishing grounds. It comprises the maximum footprint of infrastructure on the seabed plus maintenance activities throughout the O&M phase and associated temporary safety zones. The smaller the spacing between turbines the greatest the potential for vessels to have restricted access to the site. The assessment assumes that fishing will resume around and between infrastructure within the Hornsea Four array area where possible, with the exception of an assumed 50 m operating distance from infrastructure, areas of cable protection, and safety zones around infrastructure undergoing major maintenance or replacement. Furthermore, the individual decisions made by skippers with their own perception of risk will determine the likelihood of whether their fishing will resume within the Hornsea Four array area. Inclement weather will be a significant contributor to this risk perception. In addition, certain gear types including pelagic trawl, twin rigged trawls and demersal seine / fly shooting will not be practically deployed within	Primary: Co2 Co83 Co201 Tertiary: Co81 Co89 Co90 Co93 Co94 Co95 Co99 Co180	**Likely significant effect without secondary mitigation** Effect likely to be of not significant to minor adverse significance, depending on fleet assessed. Assumes fishing can resume to a degree within the array area. Effect will be long-term but highly localised and operational range of most fishing vessels is not limited to the array area	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
				• J-Tube repair/ replacement = 108,000 m^2. **Offshore substation and accommodation activities:** • Offshore substation component replacement = 6,000 m^2; • Access ladder replacement = 21,000 m^2; • Foundation anode replacement = 21,000 m^2; and • J-Tube repair/ replacement = 6,000 m^2. **Array cable activities:** • Remedial burial of array cables (42 km total length reburied) = 4,200,000 m^2; • Array cable repairs = 363,736 m^2; • Cable protection replacement = 156,000 m^2; • Ten array cable repair events over lifetime; and • Duration of each cable repair event: approximately three months. **Interconnector cable activities:** • Remedial burial of interconnector cables (7 km total length reburied) = 700,000 m^2; • Interconnector cable repairs = 20,028 m^2; • Cable protection replacement = 23,500 m^2; • Three interconnector cable repair events over lifetime; and • Duration of each cable repair event approximately three months. **Safety Zones:** • 500 m safety zones around manned offshore platforms and temporary 500 m safety zones around turbines and offshore platforms undergoing major maintenance. **Duration: Operational design life of 35 years.**	the operational array. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.											
CF-O-9	Offshore Export Cable	Operation & Maintenance	Physical presence of offshore export cable and infrastructure and maintenance activities within the Hornsea Four offshore ECC leading to reduction in access to, or exclusion from established fishing grounds.	**Total permanent reduction** **Offshore platforms:** • HVAC booster station foundations footprint and scour protection, based on three small OSS foundations (GBS (Box-type)) = 91,875 m^2; and • Minimum spacing of 1.00 m. **Offshore cables:** • Cable protection for export cables = 792,000 m^2; • Pre- and post-lay rock berm area for 54 cable crossings within the offshore ECC = 344,000 m^2. **Total temporary reduction from maintenance activities** **ECC activities:** • Remedial burial of export cables (14 km total length reburied) = 1,400,000 m^2; • Export cable repairs = 153,548 m^2; • Cable protection replacement = 198,000 m^2; and • Duration of each cable repair event: approximately three months. **HVAC booster station activities:** • Offshore substation component replacement = 1,800 m^2; • Access ladder replacement = 6,300 m^2; • Foundation anode replacement = 6,300 m^2; and • J-Tube repair/ replacement = 1,800 m^2. **Safety Zones:** • 500 m safety zones around manned offshore platforms; and • Temporary 500 m safety zones around offshore platforms undergoing major maintenance. **Duration: Operational design life of 35 years.**	This represents the maximum duration and extent of fishing exclusion throughout the operation and maintenance phase and hence the greatest potential to restrict access to fishing grounds. It comprises the maximum footprint of infrastructure on the seabed plus maintenance activities throughout the O&M phase and associated temporary safety zones. The smaller the spacing between turbines the greatest the potential for vessels to have restricted access to the site. The assessment assumes that fishing will resume along the Hornsea Four offshore cable corridor, with the exception of an assumed 50 m operating distance from infrastructure (i.e. three HVAC booster stations), areas of cable protection and safety zones around infrastructure undergoing major maintenance. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by C1.1 Draft DCO including Draft DML, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co2 Co83 Tertiary: Co81 Co89 Co90 Co93 Co94 Co95 Co99 Co180	**Likely significant effect without secondary mitigation** Effect likely to be of not significant to minor adverse significance, depending on fleet assessed. Assumes fishing can resume to a degree within the array area. Effect will be long-term but highly localised and operational range of most fishing vessels is not limited to the offshore ECC	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-O-10	All-Offshore	Operation & Maintenance	Displacement from Hornsea Four array area and Hornsea Four offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds.	As per MDS for "Physical presence of Hornsea Four array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds (CF-O-8)" and "Physical presence of offshore export cable and infrastructure within the Hornsea Four offshore cable corridor leading to reduction in access to, or exclusion from established fishing grounds (CF-O-9)".	As per the justification for "Physical presence of Hornsea Four array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds" and "Physical presence of offshore export cable and infrastructure within the Hornsea Four offshore cable corridor leading to reduction in access to, or exclusion from established fishing grounds".	Primary: Co2 Co83 Co201 Secondary: Co139 Tertiary: Co81 Co89 Co90 Co93 Co94 Co95 Co99 Co180	**Likely significant effect without secondary mitigation** Effect likely to be of of not significant to minor adverse significance, depending on fleet assessed. Assumes fishing can resume to a degree in array area and in vicinity of export cables. Effect will be highly localised and operational range of most fishing vessels is not limited to the array area or offshore ECC.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-O-11	Array Area	Operation & Maintenance	Physical presence of Hornsea Four array area leading to gear snagging.	As per MDS for "Physical presence of Hornsea Four array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds (CF-O-8)".	This represents the maximum potential for interactions between infrastructure and fishing gear. Assessment assumes that fishing will resume around and between infrastructure within the Hornsea Four array area, with the exception of an assumed 50 m operating distance from infrastructure, areas of cable protection, and safety zones around infrastructure undergoing major maintenance.	Primary: Co2 Co83 Co201 Tertiary: Co81 Co89 Co90 Co93 Co94 Co95 Co99	**Likely significant effect without secondary mitigation** Effect likely to be of of not significant to minor adverse significance, depending on fleet assessed. Standard industry practice and protocol (i.e., seabed infrastructure will be buried and/or marked on charts) minimise this risk, but it remains likely to be an area of industry concern.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
CF-O-12	Offshore Export Cable	Operation & Maintenance	Physical presence of the export cable and associated infrastructure leading to gear snagging.	As per MDS for "Physical presence of offshore export cable and infrastructure within the Hornsea Four offshore cable corridor leading to reduction in access to, or exclusion from established fishing grounds (CF-O-9)".	This represents the maximum potential for interactions between infrastructure and fishing gear. Assessment assumes that fishing will resume along the Hornsea Four offshore cable corridor, with the exception of an assumed 50 m operating distance from infrastructure, areas of cable protection and safety zones around infrastructure undergoing major maintenance.	Primary: Co2 Co83 Tertiary: Co81 Co89 Co90 Co93 Co94 Co95 Co99	**Effect likely to be of not significant to minor adverse significance, depending on fleet assessed** Standard industry practice and protocol (i.e., seabed infrastructure will be buried and/or marked on charts) minimise this risk, but it remains likely to be an area of industry concern.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-O-13	All-Offshore	Operation & Maintenance	Hornsea Four operation and maintenance activities leading to displacement or disruption of commercially important fish and shellfish resources.	See Fish and Shellfish Ecology MDS presented in Section 3.9 of **Chapter 3: Fish and Shellfish Ecology** (FSE-O-1.8, FSE-O-6, FSE-O-7, FSE-O-10, FSE-O-8).	The scenarios presented in **Chapter 3: Fish and Shellfish Ecology** provide for the greatest disturbance to fish and shellfish species and therefore the greatest knock on effect to Commercial Fisheries. Importantly, this considers the impacts as a whole on commercially important species as considered in the MDS' in **Chapter 3: Fish and Shellfish Ecology**, rather than any one impact in particular.	Primary: Co2 Co83 Secondary: Co139 Tertiary: Co81 Co94 Co180	**No likely significant effects** Effects of Hornsea Four on species of commercial importance are not expected to be significant in EIA terms and scoped out of further fish and shellfish ecology assessment.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.1.).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Minor	Low to Medium	**No significant effect (Slight Adverse)**
CF-O-14	All-Offshore	Operation & Maintenance	Physical presence of the Hornsea Four array area and export cable leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the Hornsea Four array area and offshore cable corridor.	N/A as impact scoped out.	N/A as impact scoped out	Secondary: Co139	**No likely significant effects** This effect will be localised and limited deviations to steaming routes are expected. Given adequate notification, it is expected that vessels, which typically have an operational range beyond that the Hornsea Four development area, will be in a position to avoid temporary construction/decommissioning areas and installed infrastructure with no or minimal impact on their steaming times.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.2). No additional steaming is expected to be required. Fleets can transit through the development area; magnitude and sensitivity is negligible/low for all fleets.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
CF-O-15	All-Offshore	Operation & Maintenance	Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from Hornsea Four array area and Hornsea Four offshore ECC infrastructure leading to interference with fishing activity.	**Total of 1,433 return vessel trips per year:** • 124 jack-up vessel return trips; • 1,205 crew vessel return trips; and • 104 supply vessel return trips. **Duration:** • Anticipated design life for Hornsea Four of 35 years.	The maximum number of turbines and associated infrastructure will lead to the highest level of operation and maintenance activities and therefore highest level of operation and maintenance vessel round trips.	Secondary: Co139 Tertiary: Co89 Co90 Co93 Co95 Co99 Co180	**No likely significant effects** Vessel movements associated with Hornsea Four construction, operation and maintenance, and decommissioning, will add to the existing volume of traffic in the area. However, the effect will be localised and given adequate notification, fleets will be able to avoid Hornsea Four vessel traffic.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.3).	Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-D-16	Array Area	Decomissioning	Hornsea Four array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds.	In the absence of detailed methodologies and schedules, decommissioning works and associated implications for commercial fisheries are considered analogous with those assessed for the construction phase.	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned. Decommissioning is likely to include removal of all of the wind turbine components and part of the foundations (those above seabed level) and removal of all other surface infrastructure. Some or all of the array cables, interconnector cables, and offshore export cables may be removed. Scour and cable protection would likely be left in situ. The removal of cables and rock protection is considered the MDS, however the necessity to remove cables and rock protection will be reviewed at the time of decommissioning.	Secondary: Co139 Tertiary: Co89 Co90 Co93 Co94 Co95 Co99 Co111 Co180	**Likely significant effect without secondary mitigation** As described for the construction phase; effect likely to be of of not significant to minor adverse significance, depending on fleet assessed. Potential for some loss of fishing opportunities over decommissioning period, though effect is short-term and localised, and the operational range of fleets is typically not limited to the array area.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligibe to Moderate	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Moderate	Low to Medium	**No significant effect (Neutral to Slight Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
CF-D-17	Offshore Export Cable	Decomissioning	Hornsea Four offshore ECC decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds.	As per MDS for "Hornsea Four array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds (CF-D-16)".	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.	Secondary: Co139 Tertiary: Co89 Co90 Co93 Co94 Co95 Co99 Co111 Co180	**Likely significant effect without secondary mitigation** As described for the construction phase; effect likely to be of of not significant to moderate adverse significance, depending on fleet assessed. Potential for some loss of fishing opportunities over decommissioning period, though effect is short-term and localised, and the operational range of fleets is typically not limited to the offshore ECC	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Minor to Moderate	Low to Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Minor to Moderate	Low to Medium	**No significant effect (Slight Adverse)**
CF-D-18	Array Area	Decomissioning	Displacement from Hornsea Four array area leading to gear conflict and increased fishing pressure on adjacent grounds.	As per MDS for "Hornsea Four array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds (CF-D-16)".	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.	Tertiary: Co89 Co90 Co93 Co94 Co95 Co99 Co111 Co180	**Likely significant effect without secondary mitigation** As described for the construction phase; effect likely to be of of not significant to minor adverse significance, depending on fleet assessed. Potential for displacement of fishing activity, though effect will be short-term and localised, and the operational range of fleets is typically not limited to the array area.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-D-19	Offshore Export Cable	Decomissioning	Displacement from the Hornsea Four offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds.	As per MDS for "Hornsea Four array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds (CF-D-16)".	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.	Tertiary: Co89 Co90 Co93 Co94 Co95 Co99 Co111 Co180	**Likely significant effect without secondary mitigation** As described for the construction phase; effect likely to be of of not significant to minor adverse significance, depending on fleet assessed. Potential for displacement of fishing activity, though effect will be short-term and localised, and the operational range of fleets is typically not limited to the offshore ECC.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-D-20	All-Offshore	Decomissioning	Physical presence of any infrastructure left in situ leading to gear snagging.	As per MDS for "Hornsea Four array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds (CF-D-16)".	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.	Primary: Co83 Tertiary: Co81 Co89 Co90 Co93 Co94 Co95 Co99 Co111	**Likely significant effect without secondary mitigation** As described for the operation and maintenance phase; effect likely to be of of not significant to minor adverse significance, depending on fleet assessed. Standard industry practice and protocol (i.e., seabed infrastructure will be buried and/or marked on charts) minimise this risk, but it remains likely to be an area of industry concern.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Negligible to Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**
CF-D-21	All-Offshore	Decomissioning	Decommissioning activities leading to displacement or disruption of commercially important fish and shellfish resources.	As per MDS for "Hornsea Four array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds (CF-D-16)".	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.	Tertiary: Co180	**No likely significant effects** Effects of Hornsea Four on species of commercial importance are not expected to be significant in EIA terms and scoped out of further fish and shellfish ecology assessment.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.1.).	Minor	Low to Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Minor	Low to Medium	**No significant effect (Slight Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
CF-D-22	All-Offshore	Decomissioning	Decommissioning activities leading to longer steaming distances to alternative fishing grounds.	N/A as impact scoped out.	N/A as impact scoped out	N/A	**No likely significant effects** This effect will be localised and limited deviations to steaming routes are expected. Given adequate notification, it is expected that vessels, which typically have an operational range beyond that the Hornsea Four development area, will be in a position to avoid temporary construction/decommissioning areas and installed infrastructure with no or minimal impact on their steaming times.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.2). Effects are expected to be highly localised and temporary during decommissioning; limited deviations to existing steaming routes are expected. Given adequate notification it is expected that these vessels, which have an operational range beyond that of the development, will be in a position to avoid decommissioning areas with no or minimal effect upon steaming times.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
CF-D-23	Array Area	Decomissioning	Increased vessel traffic within fishing grounds as a result of changes to shipping routes and transiting decommissioning vessel traffic from Hornsea Four array area and Hornsea Four offshore ECC leading to interference with fishing activity.	As per MDS for "Hornsea Four array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds (CF-D-16)".	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.	Tertiary: Co89 Co90 Co93 Co94 Co95 Co99 Co111 Co180	**No likely significant effects** Vessel movements associated with Hornsea Four construction, operation and maintenance, and decommissioning, will add to the existing volume of traffic in the area. However, the effect will be localised and given adequate notification, fleets will be able to avoid Hornsea Four vessel traffic.	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.8.3).	Minor	Low to Medium	**No significant effect (Not Significant to Minor Adverse)**	**Detailed Assessment**	Detailed assessment at PEIR concluded No LSE. Change in assessment methodology request in S42 response and hence reassessed in ES.	Minor	Low to Medium	**No significant effect (Neutral to Slight Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
SN-C-1	All-offshore	Construction	Construction activities associated with the Hornsea Four array area, offshore ECC and HVAC booster station search area may cause vessels to be deviated leading to increased encounters and therefore may also lead to increased vessel to vessel collision risk for all vessels in all weather conditions.	**Construction Timeline:** • Single phase of offshore construction over approximately three years. **Buoyed Construction Areas:** • Maximum extent of the Hornsea Four array area including 500 m construction Safety Zones and 50 m pre-commissioning Safety Zones; and • 500 m construction Safety Zones deployed around the HVAC booster stations. **Construction Vessels:** • Up to eight construction vessels within a given 5 km^2 area with approximately three or four 5 km^2 areas at any one time; • Up to 77 for the WTG foundations engaged at any given time with up to 2,880 return trips; • Up to 38 for the WTGs engaged at any given time with up to 900 return trips; • Up to 18 for substation and accommodation platform foundations engaged at any given time with up to 180 return trips; • Up to 18 for substation and accommodation platform installation engaged at any given time with up to 270 return trips; • Up to 18 for the inter-array and interconnector cables engaged at any one time with up to 1,488 return trips; and • Up to 24 for the export cables engaged at any given time with up to 408 return trips.	Largest extent and maximum number of construction vessels over the longest construction period with highest level of vessel activity.	Secondary: Co139 Co179 Tertiary: Co89 Co93 Co98 Co99 Co177	**Likely significant effect without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Minor	Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Minor	Low	**No significant effect (Slight)**
SN-C-2	All-offshore	Construction	Pre-commissioned structures within the Hornsea Four array area and HVAC booster station search area will create powered and drifting allision risk for all vessels.	**Construction Timeline:** • Single phase of offshore construction over approximately three years. **Array Area:** • Up to 180 WTGs on suction bucket jacket or piled jacket foundations (foundation with largest surface area at the sea surface). • Up to six offshore transformer substations on GBS foundations (foundation with largest surface area at the sea surface); • Up to three offshore High Voltage Direct Current (HVDC) converter substations on GBS foundations (foundation with largest surface area at the sea surface); and • Up to one offshore accommodation platform on GBS foundations (foundation with largest surface area at the sea surface). **Offshore ECC:** • Up to three HVAC booster stations on GBS foundations with minimum spacing of 100 m (foundation with largest surface area at the sea surface).	Largest extent and maximum number of structures over the longest construction period.	Secondary: Co139 Tertiary: Co89 Co93 Co94 Co98 Co99 Co177	**Likely significant effect without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Minor	Low	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Minor	Low	**No significant effect (Slight)**
SN-C-3	All-offshore	Construction	Pre-commissioned cables associated with the Hornsea Four array area and offshore ECC may increase anchor snagging risk for all vessels.	**Construction Timeline:** • Single phase of offshore construction over approximately three years. **Export Cables:** • Maximum export cable length of approximately 654 km (six cables of 109 km each), including within the Hornsea Four array area. **Inter Array and Interconnector Cables:** • Maximum length of array cables, up to 600 km; and • Up to six interconnector cables linking the offshore substations, up to 90 km (1.5 km in total length each).	Largest extent and maximum number of structures over the longest construction period.	Primary: Co83 Secondary: Co139 Tertiary: Co81 Co89 Co98 Co99 Co176	**Likely significant effect without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Negligible	Low	**No significant effect (Not Significant)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Negligible	N/A	**No significant effect (Not Significant)**
SN-C-4	All-offshore	Construction	Construction activities associated with the Hornsea Four array area and offshore ECC may restrict the emergency response capability of existing resources.	**Construction Vessels and Helicopters:** • Up to eight construction vessels within a given 5 km^2 area with approximately three or four 5 km^2 areas at any one time; • Up to 77 construction vessels for the WTG foundations engaged at any given time with up to 2,880 return trips and up to 180 helicopter return trips; • Up to 38 construction vessels for the WTGs engaged at any given time with up to 900 return trips and up to 135 helicopter return trips; • Up to 18 construction vessels for substation and accommodation platform foundations engaged at any given time with up to 180 return trips and up to 42 helicopter return trips; • Up to 18 construction vessels for substation and accommodation platform installation engaged at any given time with up to 270 return trips and up to 63 helicopter return trips; • Up to 18 construction vessels for the inter-array and interconnector cables engaged at any one time with up to 1,488 return trips and up to 396 helicopter return trips; and • Up to 24 construction vessels for the export cables engaged at any given time with up to 408 return trips and up to 800 helicopter return trips.	Maximum number of construction vessels over the longest construction period.	Secondary: Co179 Tertiary: Co89 Co98	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Minor	Low	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Minor	Medium	**No significant effect (Slight)**
SN-O-5	All-offshore	Operation	Presence of structures within the Hornsea Four array area, offshore ECC and HVAC booster station search area and activities associated with the Hornsea Four array area, offshore ECC and HVAC booster station search area may cause vessels to be deviated leading to increased encounters and therefore increased vessel to vessel collision risk for all vessel in all weather conditions.	**Operational Life:** • Operational life of 35 years. **Array Area:** • Structure deployment across full developable area; and • Maintenance Safety Zones of up to 500 m. **Operation and Maintenance Vessels:** • Up to 1,433 return trips per year by operation and maintenance vessels operational 24/7.	Largest extent over the longest operational period with most operational activity.	Secondary: Co178 Co179 Co200 Tertiary: Co89 Co94 Co99 Co177	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Moderate	Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Moderate	Low	**No significant effect (Slight)**
SN-O-6	All-offshore	Operation	Operational structures within the Hornsea Four array area and HVAC booster station search area may create powered and drifting allision risk for all vessels.	**Operational Life:** • Operational life of 35 years. **Array Area:** • Up to 180 WTGs on suction bucket jacket or piled jacket foundations (foundation with largest surface area at the sea surface); • Up to six offshore transformer substations on GBS foundations (foundation with largest surface area at the sea surface); • Up to three offshore HDVC converter substations on GBS foundations (foundation with largest surface area at the sea surface); • Up to one offshore accommodation platform on GBS foundations (foundation with largest surface area at the sea surface); • Minimum spacing of 810 m between structures within the Hornsea Four array area; • Maintenance Safety Zones of up to 500 m. **Offshore ECC:** • Up to three HVAC booster stations on GBS foundations (foundation with largest surface area at the sea surface); and • Minimum spacing of 100 m between the HVAC booster stations; and • Maintenance Safety Zones of up to 500 m.	Largest extent and maximum number of operation and maintenance vessels over the longest operational period.	Secondary: Co179 Co200 Tertiary: Co89 Co93 Co94 Co96 Co99 Co177	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Minor	Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Minor	Low	**No significant effect (Slight)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
SN-O-7	All-offshore	Operation	Operational cables within the Hornsea Four array area and offshore ECC may increase anchor snagging risk for all vessels and cable protection used may reduce navigable water depths for all vessels.	**Operational Life:** • Operational life of 35 years. **Export Cables:** • Maximum export cable length of approximately 654 km (six cables of 109 km each), including within the Hornsea Four array area. **Inter Array and Interconnector Cables:** • Maximum length of array cables, up to 600 km; and • Up to six interconnector cables linking the offshore substations, up to 90 km (1.5 km in total length each).	Largest extent and maximum number of structures over the longest operational period with use of cable burial protection.	Primary: Co83 Secondary: Co139 Tertiary: Co81 Co89 Co99 Co176	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Negligible	Low	**No significant effect (Not Significant)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Minor	Low	**No significant effect (Neutral)**
SN-O-8	All-offshore	Operation	Operation and maintenance activities associated with the Hornsea Four array area and offshore ECC may restrict the emergency response capability of existing resources.	**Operational Life:** • Operational life of 35 years. **Operation and maintenance vessels:** • Up to 1,433 return trips per year by operation and maintenance vessels and/or helicopters operational 24/7.	Maximum number of operation and maintenance vessels over the longest operational period.	Secondary: Co179 Tertiary: Co96 Co99	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Negligible	Low	**No Significant effect (Not Significant)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Minor	Medium	**No significant effect (Slight)**
SN-O-9	All-offshore	Operation	Operational structures within the Hornsea Four array area and offshore ECC may impact a vessel's use of its Radar, communications and navigation equipment during navigational transits.	**Operational Life:** • Operational life of 35 years. **Array Area:** • Up to 180 WTGs on suction bucket jacket or piled jacket foundations (foundation with largest surface area at the sea surface); • Up to six offshore transformer substations on GBS foundations (foundation with largest surface area at the sea surface); • Up to three offshore HDVC converter substations on GBS foundations (foundation with largest surface area at the sea surface); • Up to one offshore accommodation platform on GBS foundations (foundation with largest surface area at the sea surface); • Minimum spacing of 810 m between structures within the Hornsea Four array area; and • Maintenance Safety Zones of up to 500 m. **Offshore ECC:** • Up to three HVAC booster stations on GBS foundations (foundation with largest surface area at the sea surface); • Minimum spacing of 100 m between the HVAC booster stations; and • Maintenance Safety Zones of up to 500 m.	Largest extent and maximum number of structures over the longest operational period.	Tertiary: Co99	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Negligible	Low	**No significant effect (Not Significant)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Negligible	Low	**No significant effect (Neutral)**
SN-D-10	All-offshore	Decommissioning	Decommissioning activities associated with the Hornsea Four array area and HVAC booster station search area may cause vessels to be deviated leading to increased encounters and therefore increased vessel to vessel collision risk for all vessels in all weather conditions.	**Decommissioning Timeline:** • Single phase of offshore decommissioning over approximately three years. **Buoyed Decommissioning Areas:** • Buoyed decommissioning area deployed around the maximum extent of the Hornsea Four array area including 500 m decommissioning Safety Zones; and • Buoyed decommissioning area deployed around the HVAC booster stations including 500 m decommissioning Safety Zones.	Largest extent over the longest decommissioning period.	Secondary: Co139 Co179 Tertiary: Co89 Co93 Co99 Co177 Co181	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Minor	Medium	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Minor	Low	**No significant effect (Slight)**
SN-D-11	All-offshore	Decommissioning	Decommissioning structures within the Hornsea Four array area and HVAC booster station search area will create powered and drifting allision risk for all vessels.	**Decommissioning Timeline:** • One phase of offshore decommissioning over approximately three years. **Array Area:** • Up to 180 pre-decommissioned WTGs on suction bucket jacket or piled jacket foundations (foundation with largest surface area at the sea surface); • Up to six pre-decommissioned offshore transformer substations on GBS foundations (foundation with largest surface area at the sea surface); • Up to three pre-decommissioned offshore HVDC converter substations on GBS foundations (foundation with largest surface area at the sea surface); and • Up to one pre-decommissioned offshore accommodation platform on GBS (foundation with largest surface area at the sea surface). **Offshore ECC:** • Up to three pre-decommissioned HVAC booster stations on GBS foundations with minimum spacing of 100 m (foundation with largest surface area at the sea surface).	Largest extent and maximum number of structures over the longest decommissioning period.	Secondary: Co139 Tertiary: Co89 Co93 Co94 Co99 Co177 Co181	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Minor	Low	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Minor	Low	**No significant effect (Slight)**
SN-D-12	All-offshore	Decommissioning	Decommissioned cables left in-situ within the Hornsea Four array area and offshore ECC may increase anchor snagging risk for all vessels.	**Decommissioning Timeline:** • Single phase of offshore decommissioning over approximately three years. **Export Cables:** • Maximum export cable length of approximately 654 km (six cables of 109 km each, including within the Hornsea Four array area) left *in-situ*. **Inter Array and Interconnector Cables:** • Maximum length of array cables, up to 600 km left *in-situ*; and • Up to six interconnector cables linking the offshore substations, up to 90 km (1.5 km in total length each) left *in-situ*.	Largest extent and maximum number of structures over the longest decommissioning period. Cables left *in-situ*.	Primary: Co83 Secondary: Co139 Tertiary: Co81 Co89 Co99 Co176 Co181	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Moderate	Low	**No significant effect (Minor Adverse)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Moderate	Low	**No significant effect (Slight)**
SN-D-13	All-offshore	Decommissioning	Decommissioning activities associated with the Hornsea Four array area and offshore ECC may restrict the emergency response capability of existing resources.	**Decommissioning Timeline:** • Single phase of offshore decommissioning over approximately three years. **Decommissioning Vessels:** • Up to eight decommissioning vessels within a given 5 km^2 area with approximately three or four 5 km^2 areas at any one time; • Up to 77 decommissioning vessels for the WTG foundations engaged at any given time with up to 2,880 return trips and up to 180 helicopter return trips; • Up to 38 decommissioning vessels for the WTGs engaged at any given time with up to 900 return trips and up to 135 helicopter return trips; • Up to 18 decommissioning vessels for substation foundations engaged at any given time with up to 180 return trips and up to 42 helicopter return trips; • Up to 18 decommissioning vessels for the substation and accommodation platforms engaged at any given time with up to 270 return trips and up to 63 helicopter return trips; • Up to 18 decommissioning vessels for the inter-array and interconnector cables engaged at any one time with up to 1,488 return trips and up to 396 helicopter return trips; and • Up to 24 decommissioning vessels for the export cables engaged at any given time with up to 408 return trips and up to 800 helicopter return trips.	Maximum number of construction vessels over the longest decommissioning period.	Secondary: Co179 Tertiary: Co99 Co181	**Likely significant effects without secondary mitigation**	**Detailed Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.9.1).	Negligible	Low	**No significant effect (Not Significant)**	**Detailed Assessment**	Change in baseline data/assessment methodology and/or Project description assessment rerun and included in ES.	Negligible	N/A	**No significant effect (Not Significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
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AV-C-1	Array Area	Construction	Wind turbine effects on aviation radar systems during the construction process.	N/A as impact scoped out.	N/A as impact scoped out	N/A	**No likely significant effect** During construction, and prior to commissioning WTG blades will not be rotational. As a result, the infrastructure will not be processed and presented onto RDDS by the radar system. Therefore, there will be no impacts on radar systems during the construction phase of the project.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.10.1). During construction, and prior to commissioning WTG blades will not be rotational. As a result, the infrastructure will not be processed and presented onto Radar Data Display Screens (RDDS) by the radar system. Therefore, there will be no impacts on radar systems during the construction phase of the project.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
AV-C-2	Array Area	Construction	Creation of aviation obstacle to fixed wing and rotary aircraft operating offshore.	**Array:** • 180 WTGs with a maximum tip height of 370 m LAT; • Installation vessels – maximum of eight vessels in a given 5 km^2 area and associated construction activity; and • Impact starting from a point of zero infrastructure present to full presence over a single phase of construction over approximately three years.	Maximum number of wind turbines in the Hornsea Four array area. Maximum physical obstruction to aviation operations due to size and number of above sea level infrastructure within the Hornsea Four array area.	Tertiary: Co93 Co99 Co102	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at EIA Scoping, scoped in for assessment at PEIR.	Minor	Medium	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Order Limits. Assessment rerun and included in ES.	Minor	Medium	**No significant effect (Slight)**
AV-C-3	Array Area	Construction	Increased air traffic in the area related to wind farm activities in the construction phase may affect the available airspace for other users.	**Array:** • 180 WTGs with a maximum tip height of 370 m LAT; • Up to 135 helicopter return trips for WTG installation; • Up to 180 helicopter return trips for WTG foundation installaion; • Up to 63 helicopter return trips for OSS and accommodation platform installation; • Up to 42 helicopter return trips for OSS and accommodation platform foundation installation; • Up to 396 helicopter return trips for array and interconnector cable installation; • Up to 800 helicopter return trips for export cable installation; and • Impact starting from a point of zero infrastructure present to full presence over a single phase of construction over approximately three years.	Maximum number of helicopter trips as a result of being engaged on works for Hornsea Four causing an increased possibility of aircraft to aircraft collision.	Tertiary: Co93 Co99 Co102	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at EIA Scoping, scoped in for assessment at PEIR.	Minor	Low	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Order Limits. Assessment rerun and included in ES.	Minor	Low	**No significant effect (Slight)**
AV-O-1	All-Offshore	Operation	Creation of aviation obstacle to fixed wing and rotary aircraft operating offshore.	**Array:** • 180 WTGs with a maximum tip height of 370 m LAT; • Up to three HVAC Booster Stations along the ECC; and • Impact throughout the operation and maintenance phase of 35 years.	Maximum number of wind turbines in the Hornsea Four array area. Maximum physical obstruction to aviation operations due to size and number of above sea level infrastructure within the Hornsea Four array area.	Tertiary: Co93 Co99 Co102	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at EIA Scoping, scoped in for assessment at PEIR.	Minor	Medium	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Order Limits. Assessment rerun and included in ES.	Minor	Medium	**No significant effect (Slight)**
AV-O-2	Array Area	Operation	Wind turbines causing permanent interference on civil and military radar systems.	**Array:** • 180 WTGs with a maximum tip height of 370 m LAT; and • Impact throughout the operation and maintenance phase of 35 years.	These parameters represent the MDS for height of infrastructure within the array which has the greatest potential for interference with radar systems. Impact duration present during operational period.	None	**Likely significant effect without secondary mitigation**	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, Novermber 2018)	Moderate	High	**Significant effect (Moderate Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Order Limits. Assessment rerun and included in ES.	Moderate	High	**Significant effect (Moderate)**
AV-O-3	Array Area	Operation	Wind turbines creating an impact to offshore helicopter operations to oil and gas platforms.	**Array:** • 180 WTGs with a maximum blade tip height of 370 m above LAT; and • Impact throughout the operation and maintenance phase of 35 years.	Wind turbines with the maximum possible blade tip height creating a physical obstruction to aviation operations due to size of above sea level infrastructure.	None	**Likely significant effects without secondary mitigation**	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, Novermber 2018)	Moderate	Low	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Order Limits. Assessment rerun and included in ES.	Minor	Medium	**No significant effect (Slight)**
AV-O-4	Array Area	Operation	Disruption to aircraft using HMRs.	**Array:** • 180 WTGs with a maximum tip height of 370 m LAT; and • Impact throughout the operation and maintenance phase of 35 years.	Maximum number of wind turbines in the Hornsea Four array area. Maximum physical obstruction to aviation operations due to size and number of above sea level infrastructure within the Hornsea Four array area.	Tertiary: Co102	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at EIA Scoping, scoped in for assessment at PEIR.	Minor	Low	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Order Limits. Assessment rerun and included in ES.	Moderate	Low	**No significant effect (Slight)**
AV-D-1	Array Area	Decommissioning	Creation of aviation obstacle to fixed wing and rotary aircraft operating offshore.	**Array:** • 180 WTGs with a maximum tip height of 370 m LAT; • Decommissioning vessels - maximum of eight vessels in a given 5 km^2 area; and • Impact starting from a point of full presence of infrastructure to zero presence over a decommissioning period of approximately three years.	Maximum number of wind turbines in the Hornsea Four array area. Maximum physical obstruction to aviation operations due to size and number of above sea level infrastructure within the Hornsea Four array area.	Tertiary: Co93 Co99 Co102 Co181	**Impact not identified at Scoping**	**Simple Assessment**	Impact not identified at EIA Scoping, scoped in for assessment at PEIR.	Minor	Medium	**No significant effect (Minor Adverse)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in Order Limits. Assessment rerun and included in ES.	Minor	Medium	**No significant effect (Slight)**
AV-D-2	Array Area	Decommissioning	Increased air traffic in the area related to wind farm activities may affect the available airspace for other users	**Array:** MDS is identical (or less) to that of the construction phase (AC-C-3).	Maximum number of helicopter trips as a result of being engaged on works for Hornsea Four causing an increased possibility of aircraft to aircraft collision.	Secondary: Co200 Tertiary: Co93 Co99 Co102 Co181	**Impact not identified at Scoping**	**Impact not identified at PEIR**	Impact not identified at PEIR.	N/A	N/A	**N/A**	**Simple Assessment**	Assessment included in ES.	Minor	Low	**No significant effect (Slight)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
MA-C-1	All-Offshore	Construction	Disturbance, removal, intrusion, compression and/or penetration of sediments containing archaeological receptors (material or contexts) leading to total or partial loss in Hornsea Four array area and offshore ECC from construction activities.	N/A as scoped out.	N/A as scoped out.	Primary: Co46 Secondary: Co166 Co167 Tertiary: Co140	**No likely significant effect** The implementation of Commitments will result in a negligible impact on marine archaeology receptors. Previous assessments for Hornsea Project One, Hornsea Project Two and Hornsea Three have shown that this will have no likely significant effect with application of best-practice mitigation.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.7.1).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
MA-C-2	All-Offshore	Construction	Intrusion of piling foundations disturbing or destroying archaeological receptors in Hornsea Four array area and offshore ECC from construction activities.	N/A as scoped out.	N/A as scoped out.	Primary: Co46 Secondary: Co166 Co167 Tertiary: Co140	**No likely significant effect** The implementation of Commitments will result in a negligible impact during piling operations, primarily by ensuring identification of marine archaeology receptors and avoidance. Previous assessments for Hornsea Project One, Hornsea Project Two and Hornsea Three have shown that this will have no likely significant effect with application of best-practice mitigation.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.7.2).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
MA-C-3	All-Offshore	Construction	Compression of stratigraphic contexts containing archaeological material from combined weight of foundation, transition piece, tower, and wind turbines in Hornsea Four array area and offshore ECC from construction activities.	N/A as scoped out.	N/A as scoped out.	Primary: Co46 Secondary: Co166 Co167 Tertiary: Co140	**No likely significant effect** The implementation of Commitments will result in a negligible impact from compression effects. Previous assessments for Hornsea Project One, Hornsea Project Two and Hornsea Three have shown that this will have no likely significant effect with application of best-practice mitigation.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.7.3).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
MA-C-6	All-Offshore	Construction	Disturbance of sediment containing potential archaeological receptors (material and contexts) during cable laying operations.	N/A as scoped out.	N/A as scoped out.	Primary: Co46 Secondary: Co166 Co167 Tertiary: Co140	**No likely significant effect** The implementation of Commitments will result in a negligible impact resulting from cable laying operations, primarily through the identification and avoidance of marine archaeology receptors. Previous assessments for Hornsea Project One, Hornsea Project Two and Hornsea Three have shown that this will have no likely significant effect with application of best-practice mitigation.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.7.4).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
MA-O-7	All-Offshore	Operation	Scour, penetration, draw down and compression effects caused by (a) the presence of Wind Turbine Generator (WTG) and substation foundations, and (b) the exposure and replacement of cables or the use of cable protection measures (such as remedial cable burial), impacting archaeological receptors and exposing such material to natural, chemical or biological processes and causing or accelerating loss of the same.	**Array Area:** **WTG Foundations:** • 110 Gravity Base Structures (GBS) (WTG-type) foundations with associated scour protection, total seabed permanent area 504,540 m^2.; and • 70 suction caisson jacket (WTG type) foundations with associated scour protection, total seabed permanent area 296,881 m^2. **Offshore Platforms:** • Up to six small Offshore Substations (OSS) on GBS (Box-type) foundations with association scour protection, and up to three large OSS on GBS (large OSS) foundations with associated scour protection, total seabed permanent area 371,250 m^2; and • One offshore accommodation platform on a GBS (Box type) foundations, total seabed permanent area 30,625 m^2. **Array and Interconnector Cable Protection:** • 32 cable crossings (including interconnector cables); • 204,000 m^2 cable/pipe crossings: pre- and post-lay rock berm area; and • 221,000 m^3 cable/pipe crossings: pre- and post-lay rock berm volume. **Array Cable Activities:** • Remedial burial of array cables (42 km total length reburied, 100 m width) = 4,200,000 m^2; • Array cable repairs (up to 10 array cable repairs) = 363,736 m^2; and • Cable protection replacement (25% of cable protection replaced) = 156,000 m^2. **Interconnector Cable Activities:** • Remedial burial of interconnector cables (7 km total length reburied, 100 m width) = 700,000 m^2; • Interconnector cable repairs (up to three interconnector cable repairs) = 20,028 m^2; and • Cable protection replacement (25% of cable protection replaced) = 23,500 m^2. **Offshore ECC:**	Design scenario representing the maximum spatial extent of disturbance to archaeological receptors in relation to scour, penetration, draw down and compression effects. It is important to note that three HVDC converter substations in the array area are mutually exclusive with three HVAC booster stations along the ECC in a single transmission system. As secured by **C1.1 Draft DCO including Draft DML**, a maximum of ten OSS and platforms will be constructed within the Hornsea Four Order Limits, however in order to assess the MDS for both the array and the ECC, the presence of the maximum numbers of OSS and platforms in each area has been considered (ten and three, respectively). As a result, the outcome of the assessment is therefore inherently precautionary.	Primary: Co46 Co201 Secondary: Co166 Co167 Tertiary: Co140	**Likely significant effect without secondary mitigation** Currently only the broad locations of known wrecks and obstructions are available, with the position and extent of the marine archaeological resources at Hornsea Four not yet established.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in baseline data/ assessment methodology and/or Project Description. Assessment rerun and included in ES.	Negligible	N/A	**No significant effect (Not Significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
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				High Voltage Alternating Current (HVAC) Booster Stations: • Up to three HVAC booster stations on GBS (Box-type) foundations with associated scour protection, total seabed permanent area 91,875 m^2. **Offshore Export Cable Protection:** • 54 cable crossings; • 344,000 m^2 cable/pipe crossings: pre- and post-lay rock berm area; and • 372,000 m^2 cable/pipe crossings: pre- and post-lay rock berm volume. **Offshore Export Cable Activities:** • Remedial burial of export cables (14 km total length reburied, 100m width) = 1,400,000 m^2; • Export cable repairs (up to 23 export cable repairs) = 153,548 m^2; and • Cable protection replacement (25% of cable protection replaced) = 198,000 m^2.														
MA-O-8	Array Area	Operation	Penetration and compression effects on seabed caused by corrective and preventative operation and maintenance activities (via jack-up vessels or divers) leading to total or partial loss of archaeological receptors (material or contexts).	**WTG O&M activities requiring Jack Up Vessels (JUVs):** • Component replacement (1260 events, 300 m^2 disturbances per jack-up event) = 378,000 m^2; • Access ladder replacement (1260 events, 300 m^2 disturbances per jack-up event) = 378,000 m^2; • Foundation anode replacement (1260 events, 300 m^2 disturbances per jack-up event) = 378,000 m^2; and • J-Tube repair/ replacement (360 events, 300 m^2 disturbances per jack-up event) = 108,000 m^2. **Offshore Platform O&M activities requiring JUV or anchoring:** • Offshore substation component replacement (20 events, 300 m^2 disturbances per jack-up event) = 6,000 m^2; • Access ladder replacement (300 events, 300 m^2 disturbances per jack-up event) = 90,000 m^2; • Foundation anode replacement (70 events, 300 m^2 disturbances per jack-up event) = 21,000 m^2; and • J-Tube repair/ replacement (20 events, 300 m^2 disturbances per jack-up event) = 6,000 m^2. **Cable O&M activities requiring JUV or anchoring:** • Array cable repairs (10 events, 300 m^2 disturbance per jack-up event) = 3,000 m^2; • Export cable repairs (23 events, 300 m^2 disturbance per jack-up event) = 6,900 m^2; and • Interconnector cable repairs (3 events, 300 m^2 disturbance per jack-up event) = 900 m^2.	Design scenario representing the maximum spatial extent of disturbance to archaeological receptors in relation to penetration and compression effects.	Primary: Co46 Secondary: Co166 Co167 Tertiary: Co140	**Likely significant effect without secondary mitigation** Currently only the broad locations of known wrecks and obstructions are available, with the position and extent of the marine archaeological resources at Hornsea Four not yet established.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in baseline data/ assessment methodology and/or Project Description. Assessment rerun and included in ES.	Negligible	N/A	**No significant effect (Not Significant)**
MA-D-9	Array Area	Decommissioning	Draw-down of sediment into voids left by removed foundations or cables leading to loss of sediment, destabilising archaeological sites and contexts, and exposing such material to natural, chemical or biological processes, and causing or accelerating loss of the same.	**WTGs and Offshore Platforms:** • All structures above the seabed or ground level will be completely removed. The decommissioning sequence will generally be the reverse of the construction sequence; and • Total disturbance as a result of the removal of all structures is assumed to be the same as during installation as set out in MA-O-7. **Cable removal activities:** • Although it is expected that most array and export cables will be left in situ, it has been assumed that all cables will be removed during decommissioning, though any cable protection installed will be left in situ); and • Total disturbance as a result of the removal of all cables is assumed to be the same as during installation as set out in MA-O-7.	Design scenario representing the maximum spatial extent of disturbance to archaeological receptors in relation to draw-down effects. The removal of cables and rock protection is considered the MDS, however the necessity to remove cables and rock protection will be reviewed at the time of decommissioning.	Primary: Co46 Co201 Secondary: Co166 Co167 Tertiary: Co140 Co181	**Likely significant effect without secondary mitigation** Currently only the broad locations of known wrecks and obstructions are available, with the position and extent of the marine archaeological resources at Hornsea Four not yet established.	**Simple Assessment**	Scoped into assessment at PEIR based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible	N/A	**No significant effect (Not Significant)**	**Simple Assessment**	Simple assessment at PEIR concluded No LSE. Change in baseline data/ assessment methodology and/or Project Description. Assessment rerun and included in ES.	Negligible	N/A	**No significant effect (Not Significant)**
MA-D-10	Array Area	Decommissioning	Draw-down of sediment into voids left by removed foundations leading to loss of sediment and penetration and compression effects of jack-up barges and anchoring of decommissioning vessels leading to total or partial loss of archaeological receptors (material or contexts).	N/A as scoped out.	N/A as scoped out.	Primary: Co46 Secondary: Co166 Co167 Tertiary: Co140 Co181	**No likely significant effect** The implementation of Commitments will result in a negligible impact on marine archaeology receptors. Previous assessments for Hornsea Project One, Hornsea Project Two and Hornsea Three have shown that this will have no likely significant effect with application of best-practice mitigation.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.7.7).	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**

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SVR-C-1A	Array Area	Construction	Offshore construction activities of array area visible by day and night from offshore visual receptors	N/A as scoped out.	N/A as scoped out	None	**No likely significant effects** The considerable distance from the area where the majority of movements of people on recreational boats (which are considered to be the most sensitive receptors) are shown to occur.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.11.1). The considerable distance from the area where the majority of movements of people on recreational boats (which are considered to be the most sensitive receptors) are shown to occur.	N/A	N/A	**No LSE**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
SVR-C-1B	Offshore HVAC booster stations	Construction	Offshore construction activities of HVAC booster stations visible by day and night from offshore visual receptors	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**Likely significant effect without secondary mitigation** The considerable distance from the area where the majority of movements of people on recreational boats (which are considered to be the most sensitive receptors) are shown to occur.	**Impact not considered in PEIR**	Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17), this impact is not required to be considered in the ES.	N/A	N/A	**No LSE**	**Not considered in detail in the ES.**	Not considered in detail in the ES. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-C-2	Offshore HVAC booster stations	Construction	Impact on landscape character of FHHC as a result of views of HVAC booster station and cable construction	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The visual effect on any areas designated for their landscape or scenic quality (i.e. the seaward area of the Heritage Coast) is limited due to distance.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.11.1.1 - 4.11.1.3).	Low	Medium	**No LSE (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-C-3	Offshore HVAC booster stations	Construction	Impact on the views and visual receptors located within the FHHC as a result of views of HVAC booster station and cable construction.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The visual effect on any areas designated for their landscape or scenic quality (i.e. the seaward area of the Heritage Coast) is limited due to distance.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Low	Medium to Medium-High	**No LSE (Not Significant)**	**NNot considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-C-4	Offshore HVAC booster stations	Construction	Impact on landscape character, views and visual receptors located within FHHC as a result of HVAC booster stations and cable corridor construction lighting	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The visual effect on any areas designated for their landscape or scenic quality (i.e. the seaward area of the Heritage Coast) is limited due to distance.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Medium-Low	Medium	**No LSE (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-C-5	All-Offshore	Construction	Impact on seascape character of MCAs as a result of physical presence and views of all offshore project elements during construction.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The impact on MCAs will be limited and the areas will remain open and characterised by its existing elements which include oil and gas platforms and offshore wind farms.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Medium	Low to Medium	**No LSE (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-O-13	Offshore HVAC booster stations	Operation & Maintenance	Offshore array area, Offshore export cables and HVAC booster stations night-time impacts on seascape character effects.	N/A as scoped out.	N/A as scoped out	Secondary: Co200	**No likely significant effects** The considerable distance from the area where the majority of movements of people on recreational boats (which are considered to be the most sensitive receptors) are shown to occur.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.11.4). The considerable distance from the area where the majority of movements of people on recreational boats (which are considered to be the most sensitive receptors) are shown to occur.	N/A	N/A	**No LSE**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
SVR-O-5	All-Offshore	Operation & Maintenance	Impact on seascape and landscape character of MCAs as a result of physical presence and views of the array area and HVAC booster stations	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The considerable distance from the area where the majority of movements of people on recreational boats (which are considered to be the most sensitive receptors) are shown to occur.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID:4.11.6).	Negligible to Medium	Low to Medium	**No LSE (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**

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SVR-O-6	Offshore HVAC booster stations	Operation & Maintenance	Impact on the views and visual receptors located within the FHHC as a result of views of HVAC booster stations.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The visual effect on any areas designated for their landscape or scenic quality (i.e. the seaward area of the Heritage Coast) is limited due to distance.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Low	Medium to Medium-High	**No significant effect (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-O-7	Offshore HVAC booster stations	Operation & Maintenance	Impact on landscape character, views and visual receptors located within FHHC as a result of HVAC booster station lighting	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The visual effect on any areas designated for their landscape or scenic quality (i.e. the seaward area of the Heritage Coast) is limited due to distance.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Low	Medium	**No significant effect (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-D-9	All-Offshore	Decommissioning	Impact on seascape of MCAs as a result of physical presence and views of the array area and HVAC booster stations being decommissioned.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The considerable distance from the area where the majority of movements of people on recreational boats (which are considered to be the most sensitive receptors) are shown to occur.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Negligible to Medium	Low to Medium	**No significant effect (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-D-10	Offshore HVAC booster stations	Decommissioning	Impact on landscape character of FHHC as a result of views of HVAC booster stations being decommissioned.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The visual effect on any areas designated for their landscape or scenic quality (i.e. the seaward area of the Heritage Coast) is limited due to distance.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Low	Medium	**No significant effect (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-D-11	All-Offshore	Decommissioning	Impact on the views and visual receptors located within the FHHC as a result of views of HVAC booster stations being decommissioned.	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The visual effect on any areas designated for their landscape or scenic quality (i.e. the seaward area of the Heritage Coast) is limited due to distance.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Low	Medium to Medium-High	**No significant effect (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**
SVR-D-12	Offshore HVAC booster stations	Decommissioning	Impact on landscape character, views and visual receptors located within FHHC as a result of HVAC booster station decommissioning lighting	N/A as not considered in detail in the ES.	N/A as not considered in detail in the ES.	Secondary: Co200	**No likely significant effects** The visual effect on any areas designated for their landscape or scenic quality (i.e. the seaward area of the Heritage Coast) is limited due to distance.	**Simple Assessment**	Scoped into assessment based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018).	Medium-Low	Medium	**No significant effect (Not Significant)**	**Not considered in detail in the ES. No likely significant effect identified at PEIR.**	Not considered in detail in the ES. No likely significant effect identified at PEIR. Simple Assessment at PEIR which concluded that there was no likely significant effect. Refined lighting requirements for the HVAC booster stations. Consultation undertaken with relevant stakeholders (ERYC and Natural England) who agreed that based on the distance of the array area and the HVAC Booster Stations from receptors and the refined lighting requirements for the HVAC Booster Stations (secured by the HVAC Booster Station Lighting Plan (Document F2.17)), this impact is not required to be considered in the ES.	N/A	N/A	**No significant effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
IOU-AP-1	All Offshore	All phases	Impacts on aggregate extraction or resource areas.	N/A as scoped out	N/A as scoped out	N/A	**No likely significant effect** Given that there are no licensed aggregate dredging sites within 30+km to the Hornsea Four array area or offshore ECC, impacts on aggregate dredging activity will be scoped out of any further consideration in the EIA process.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.1). Given that there are no licensed aggregate dredging sites within 30+ km of the Hornsea Four array area or offshore ECC, impacts on aggregate dredging activity will be scoped out of any further consideration in the EIA process.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
IOU-AP-2	All Offshore	All phases	Impacts on marine disposal sites	N/A as scoped out	N/A as scoped out	N/A	**No likely significant effect** As there are no active, licensed sites within or within 2 km of the Hornsea Four array area (excluding the adjacent Hornsea One and Two sites) or offshore ECC, impacts on disposal sites will be scoped out of any further consideration in the EIA process.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.2). As there are no active, licensed sites within or within 2 km of the Hornsea Four array area (excluding the adjacent Hornsea Project One and Hornsea Project Two sites) or offshore ECC, and significant effects are unlikely to occur at any phase of the project development on licensed disposal sites the receptor will be scoped out of any further consideration in the EIA process.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
IOU-AP-4	All Offshore	All phases	Safety zones and advisory safety distances associated with Hornsea Four infrastructure, may lead to temporary loss or restrict access to cables for repair and maintenance.	N/A as scoped out	N/A as scoped out	Tertiary: Co89 Co107	**No likely significant effect** Restriction of access to the Viking Link for inspection and maintenance activities could be critical to the operator. The operators of active cables are deemed to be of medium vulnerability, medium recoverability and high value.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.4). Restriction of access to the Viking Link Interconnector for inspection and maintenance activities could be critical to the operator. The operators of active pipelines and cables are deemed to be of medium vulnerability, medium recoverability and high value. The suggested embedded mitigation, including crossing and proximity agreements with known existing pipeline and cables operators, will ensure access for cable or pipeline repair and maintenance, and as such does not need to be considered any further in the assessment.	N/A	N/A	**No significant effect**	**Scoped Out**	N/A as scoped out.	N/A	N/A	**No significant effect**
IOU-AP-5	All Offshore	All phases	Displacement of recreational craft and recreational fishing vessels resulting in a loss of recreational resource.	N/A as scoped out	N/A as scoped out	Primary: Co2 Tertiary Co89	**Impact not identified at Scoping**	**Scoped Out**	Impact not identified at EIA Scoping, scoped out for assessment at PEIR.	N/A	N/A	**No significant effect**	**Scoped Out**	A consideration of marine recreational activity was not included within the Scoping process. However, consideration of impacts were considered at PEIR, although the Applicant considered that there will be no significant impacts and therefore scoped out further consideration of impacts on marine recreational receptors at PEIR. No objection came forward from consultees in s42 responses.	N/A	N/A	**No significant effect**
IOU-C-1	All Offshore	Construction	Hornsea Four infrastructure, safety zones and advisory safety distances may restrict access to the proposed Endurance CCS Site and associated infrastructure.	**Total temporary reduction:** **WTG and platforms:** • Seabed preparation for 110 GBS (Wind Turbine Generator (WTG) type) foundations for WTGs = 411,321 m^2; • Seabed preparation for 70 suction caisson jacket (WTG type) foundations for WTGs = 198,870 m^2; • Seabed preparation for OSS within the array (three large OSS on GBS (large OSS) foundations and six small OSS on suction caisson jacket (small OSS) = 156,594 m^2; • Seabed preparation for one accommodation platform on a suction caisson jacket (small OSS) foundation = 12,321 m^2; **Offshore cables:** • Boulder and sandwave clearance for array cables (600 km length, 40 m width) = 24,000,000 m^2; • Burial of array cables (600 km length, 15 m width) = 9,000,000 m^2; • Boulder and sandwave clearance for interconnector cables (90 km length, 40 m width) = 3,600,000 m^2; • Burial of interconnector cables (90 km length, 15 m width) = 1,350,000 m^2; and **Safety Zones:** **WTG, platforms and HVAC platforms:** • 500 m exclusion zones around construction activities = 790,000 m^2 per structure under construction at any one time; and • 50 m exclusion zones around incomplete structures = 7,854 m^2 per partially constructed structure at any one time. **Offshore Cables:** • Roaming 500 m safe passing distance for mobile installation vessels, which may, in exceptional circumstances, be increased to 1,000 m dependant on the nature of the installation works. **Total permanent reduction:** **WTG and platforms:** • Total seabed area for 180 WTG on GBS (WTG-type) foundations and associated scour protection footprint = 1,222,724 m^2; • Total seabed area for OSS in the array (three large OSS on GBS (large OSS) foundations and six small OSS on GBS (Box-type) foundations, including associated scour protection = 371,250 m^2; and • Total seabed area for one offshore accommodation platform within the array on a small OSS foundation (GBS (Box-type)), including associated scour protection = 30,625 m^2. **Offshore cables:** • Cable protection for array cables = 624,000 m^2; • Cable protection for interconnector cables = 94,000 m^2; and • Pre- and post-lay rock berm area for 32 cables crossings within the array area = 204,000 m^2.	Parameters that create the greatest reduction in available sea room and are most likely to give rise to potential interactions with CCS activities in terms of area affected and duration.	Primary: Co201 Secondary: Co139 Tertiary: Co57 Co81 Co89 Co93 Co94 Co107	**Impact not identified at Scoping and therefore scoped out of PEIR**	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.3).	N/A	N/A	**No significant effect**	**Detailed Assessment**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.3). Impact re-considered in the ES following consultation and scoped in for assessment at ES.	Moderate	High	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
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IOU-C-2	All Offshore	Construction	Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance.	**Total temporary reduction:** **Wind Turbine Generators (WTG) and platforms:** • Seabed preparation for 180 WTG on GBS (WTG-type) foundations = 673,071 m^2; • Seabed preparation for offshore transformer substations (OSS) within the array (three large OSS on GBS (large OSS) foundations and six small OSS on suction caisson jacket (small OSS) = 156,594 m^2; • Seabed preparation for one accommodation platform on a suction caisson jacket (small OSS) foundation = 12,321 m^2; **Offshore cables:** • Boulder and sandwave clearance for array cables (600 km length, 40 m width) = 24,000,000 m^2; • Burial of array cables (600 km length, 1.5 m width) = 9,000,000 m^2; • Boulder and sandwave clearance for interconnector cables (90 km length, 40 m width) = 3,600,000 m^2; • Burial of interconnector cables (90 km length, 1.5 m width) = 1,350,000 m^2; and **HVAC Offshore platforms:** • Seabed preparation for three HVAC booster stations on suction caisson jacket (small OSS) foundations = 36,963 m^2; **HVAC Offshore Cables:** • Boulder and sandwave clearance for export cables (654 km length, 40 m width) = 26,160,000 m^2; • Burial of export cables (654 km length, 1.5 m width) = 9,810,000 m^2; • Cable jointing (four joints per cables, six cables and 3,500 m2 per joint) = 84,000 m^2; and **Safety Zones:** **WTG, platforms and HVAC platforms:** • 500 m exclusion zones around construction activities = 790,000 m^2 per structure under construction at any one time; and • 50 m exclusion zones around incomplete structures = 7,854 m^2 per partially constructed structure at any one time. **Offshore and HVAC Cables:** • Roaming 500 m safe passing distance for mobile installation vessels, which may, in exceptional circumstances, be increased to 1,000 m dependant on the nature of the installation works. **Construction Duration:** Offshore construction over a three-year period, including: • Foundation installation = 12 months; • Turbine installation = 24 months • Platform installation = two months per platform; and • Cable installation = 24 months. **Total permanent reduction:** **WTG and platforms:** • Total seabed area for 180 WTG on GBS (WTG-type) foundations and associated scour protection footprint = 1,222,724 m^2; • Total seabed area for OSS in the array (three large OSS on GBS (large OSS) foundations and six small OSS on GBS (Box-type) foundations, including associated scour protection = 371,250 m^2; and • Total seabed area for one offshore accommodation platform within the array on a small OSS foundation (GBS (Box-type)), including associated scour protection = 30,625 m^2. **Offshore cables:** • Cable protection for array cables = 624,000 m^2; • Cable protection for interconnector cables = 94,000 m^2; and • Pre- and post-lay rock berm area for 32 cables crossings within the array area = 204,000 m^2. **HVAC Offshore platforms:** • Total seabed area for three HVAC booster stations on small OSS GBS (Box-type) foundations, including associated scour protection = 91,875 m^2. **HVAC Offshore cables:** • Cable protection for export cables = 792,000 m^2; • Pre- and post-lay rock berm area for 54 cable crossings within the offshore ECC = 344,000 m^2.	Parameters that create the greatest reduction in available sea room and the greatest disruption to vessel access in terms of area affected and duration.	Primary: Co201 Secondary: Co139 Tertiary: Co57 Co81 Co89 Co94 Co96 Co98 Co102 Co107 Co200	**No likely significant effect** Restriction of access to the pipelines for inspection and maintenance activities could be critical to the operator. The operators of active pipelines are deemed to be of medium vulnerability, medium recoverability and high value.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.4).	N/A	N/A	**No significant effect**	**Detailed Assessment**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.4). Impact re-considered in the ES following consultation and scoped in for assessment at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-C-3	All Offshore	Construction	The piling of Hornsea Four wind turbine and substation foundations will generate vibration that may cause damage to existing pipelines and wells.	**Array Area (spatial MDS):** • 180 monopile WTG foundations (1.5 m diameter) with two foundations installed concurrently; • Six small OSS (1.5 m diameter monopiles); • Three large OSS (1.5 m diameter monopiles); • One offshore accommodation platform (1.5 m diameter monopiles); • Maximum hammer energy 5,000 kJ; • Four hour piling duration; • 1.2 days per monopile; • 216 piling days (single vessel); • 106 piling days (two vessels); and • Maximum separation distance between piling events will be the maximum extent of the array area. **Array Area (temporal MDS):** • 180 WTG on piled jacket (WTG-type) foundations (three 4 m diameter pin piles per jacket) – 540 pin piles; • Six OSS on piled jacket (small OSS) foundations (six legs per jacket and four 3.5 m pin piles per leg) – 144 pin piles; • Three OSS on piled jacket (large OSS) foundations (eight legs per jacket and two piles per leg) – 48 pin piles; • One offshore accommodation platform on a piled jacket (small OSS) foundation (six legs and four 3.5 m pin piles per leg – 24 pin piles; • Total of 756 pin piles in the array; • Maximum hammer energy 3,000 kJ; • 1.5 days per jacket foundation; • 270 piling days (single vessel); and • 135 days (two vessels). **HVAC Booster Area of Search (spatial MDS):** • Three HVAC booster stations on 1.5 m diameter monopile foundations; • Maximum hammer energy 5,000 kJ; • Four hour piling duration; and • 1.2 days per monopile. **HVAC Booster Area of Search (temporal MDS):** • Three HVAC booster stations on piled jacket (small OSS) foundations (six legs per jacket and four 3.5 m diameter pin piles per leg) – 72 pin piles.	Parameters that equates to the largest number of piling activities and for the greatest duration.	Secondary: Co139 Tertiary: Co107	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
IOU-C-4	All Offshore	Construction	Anchor snagging or dropping from vessel traffic associated with Hornsea Four that may cause damage to existing pipelines and wells.	**WTG Foundation Installation (if gravity base foundation WTG type):** • Six installation vessels (two Jack Up Vessels (JUV), two anchored or four DP2 or six Tugs) (90 return trips if two JUVs, two anchored or four DP2; 540 if six tugs); • 19 support vessels (900 return trips); • 40 Transport / Feeder vessels (incl. Tugs) (720 return trips); • 12 Dredging vessels (720 return trips); and • Duration: 12 months. **WTG installation:** • Two installation vessels (90 return trips); • 12 Support vessels (270 return trips); • 24 transport (540 return trips); and • Duration: 24 months. **Substation foundation installation (all OSSs and the accommodation platform):** • Two installation vessels (24 return trips); • 12 Support vessels (108 return trips); • Four transport (48 return trips); and • Duration: 12 months. **Substation installation (all OSSs and the accommodation platform):** • Two installation vessels (36 return trips); • 12 Support vessels (162 return trips); • Four transport (72 return trips); and • Duration: 24 months. **Array and offshore interconnector cables installation:** • Three main laying vessels (204 return trips); • Three main burying vessels (204 return trips); • 12 support vessels (1,080 return trips); and • Duration: 24 months. **Offshore export cables installation:** • Three main laying vessels (96 return trips); • Three main jointing vessels (72 return trips); • Three main burying vessels (96 return trips); • 15 support vessels (144 return trips); and • Duration: 24 months.	Parameters that create the greatest reduction in available sea room and are most likely to give rise to potential interactions with existing pipelines and wells.	Secondary: Co139 Tertiary: Co107	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-C-5	All Offshore	Construction	Allision risk to oil and gas platforms due to vessels being deviated from existing routes due to the presence of Hornsea Four infrastructure	**The presence of the installed Hornsea Four infrastructure:** • Construction of 180 WTG utilising the entire array area (468 km^2) • 10 offshore platforms within the array area (up to six OSS, three convertor substations and one accommodation platform) • Three HVAC booster stations within the HVAC booster station area of search **Safety zones:** • 500 m safety zones around infrastructure under construction • 50 m safety zones around incomplete structures **Duration:** • Anticipated three year constuction phase.	Parameters that create the greatest reduction in available sea room and are most likely to give rise to deviation of shipping from existing routes.	Secondary: Co139 Tertiary: Co81 Co89 Co93	**Impact not identified at Scoping**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-C-6	All Offshore	Construction	Proximity to Hornsea Four infrastructure and associated works may restrict or hamper access to oil and gas platforms and subsurface infrastructure during certain periods (e.g., allowable weather).	**The presence of the installed Hornsea Four infrastructure within the array area:** • Construction of 180 WTG utilising the entire array area (468 km^2) • 10 offshore platforms within the array area (up to six OSS, three convertor substations and one accommodation platform) **The WTG dimensions are as follows:** • 42.43 m minimum height of lowest blade tip above Lowest Astronomical Tide (LAT) • 370 m maximum blade tip height above LAT • 305 m maximum rotor blade diameter **Safety zones:** • 500 m safety zones around infrastructure under construction • 50 m safety zones around incomplete structures **Duration:** • Anticipated three year constuction phase.	Parameters that create the greatest disruption to vessel access in terms of area affected and duration.	Secondary: Co139 Tertiary: Co81 Co89 Co93 Co94	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-C-7	All Offshore	Construction	Wind turbines and associated works may result in deviations to routine support vessel routeing to oil and gas platforms.	As per MDS above (Impact ID IOU-C-6)	As MDS justification above (Impact ID IOU-C-7).	Secondary: Co139 Tertiary: Co81 Co89 Co93 Co94	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-C-8	All Offshore	Construction	Hornsea Four infrastructure, safety zones, advisory safety distances and piling may restrict or cause acoustic interference with potential seismic survey activity	**Array Area (spatial MDS):** • 180 monopile WTG foundations (1.5 m diameter) with two foundations installed concurrently; • Six small OSS (1.5 m diameter monopiles); • Three large OSS (1.5 m diameter monopiles); • One offshore accommodation platform (1.5 m diameter monopiles); • Maximum hammer energy 5,000 kJ; • Four hour piling duration; • 1.2 days per monopile; • 216 piling days (single vessel); • 106 piling days (two vessels); and • Maximum separation distance between piling events will be the maximum extent of the array area. **Array Area (temporal MDS):** • 180 WTG on piled jacket (WTG-type) foundations (three 4 m diameter pin piles per jacket) – 540 pin piles; • Six OSS on piled jacket (small OSS) foundations (six legs per jacket and four 3.5 m pin piles per leg) – 144 pin piles; • Three OSS on piled jacket (large OSS) foundations (eight legs per jacket and two piles per leg) – 48 pin piles; • One offshore accommodation platform on a piled jacket (small OSS) foundation (six legs and four 3.5 m pin piles per leg – 24 pin piles; • Total of 756 pin piles in the array; • Maximum hammer energy 3,000 kJ; • 1.5 days per jacket foundation; • 270 piling days (single vessel); and	Parameters that create the greatest disruption to seismic survey activities in terms of area affected and duration.	Secondary: Co139 Tertiary: Co57 Co89 Co93 Co94 Co96 Co98 Co102 Co107	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**

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				• 135 days (two vessels). **HVAC Booster Area of Search (spatial MDS):** • Three HVAC booster stations on 1.5 m diameter monopile foundations; • Maximum hammer energy 5,000 kJ; • Four hour piling duration; and • 1.2 days per monopile. **HVAC Booster Area of Search (temporal MDS):** • Three HVAC booster stations on piled jacket (small OSS) foundations (six legs per jacket and four 3.5 m diameter pin piles per leg) – 72 pin piles.													
IOU-C-9	All Offshore	Construction	Drilling and the installation of oil and gas infrastructure has the potential to be restricted by the presence of Hornsea Four infrastructure, safety zones and advisory safety distances	**Total temporary reduction:** **WTG and platforms:** • Seabed preparation for 180 WTG on GBS (WTG-type) foundations = 673,071 m^2; • Seabed preparation for OSS within the array (three large OSS on GBS (large OSS) foundations and six small OSS on suction caisson jacket (small OSS) = 156,594 m^2; • Seabed preparation for one accommodation platform on a suction caisson jacket (small OSS) foundation = 12,321 m^2; **Offshore cables:** • Boulder and sandwave clearance for array cables (600 km length, 40 m width) = 24,000,000 m^2; • Burial of array cables (600 km length, 1.5 m width) = 9,000,000 m^2; • Boulder and sandwave clearance for interconnector cables (90 km length, 40 m width) = 3,600,000 m^2; • Burial of interconnector cables (90 km length, 1.5 m width) = 1,350,000 m^2; and **HVAC Offshore platforms:** • Seabed preparation for three HVAC booster stations on suction caisson jacket (small OSS) foundations = 36,963 m^2; **HVAC Offshore Cables:** • Boulder and sandwave clearance for export cables (654 km length, 40 m width) = 26,160,000 m^2; • Burial of export cables (654 km length, 1.5 m width) = 9,810,000 m^2; • Cable jointing (four joints per cables, six cables and 3,500 m2 per joint) = 84,000 m^2; and **Safety Zones:** **WTG, platforms and HVAC platforms:** • 500 m exclusion zones around construction activities = 790,000 m^2 per structure under construction at any one time; and • 50 m exclusion zones around incomplete structures = 7,854 m^2 per partially constructed structure at any one time. **Offshore and HVAC Cables:** • Roaming 500 m safe passing distance for mobile installation vessels, which may, in exceptional circumstances, be increased to 1,000 m dependant on the nature of the installation works. **Construction Duration:** • Offshore construction over a three-year period, including: • Foundation installation = 12 months; • Turbine installation = 24 months • Platform installation = two months per platform; and • Cable installation = 24 months. **Total permanent reduction:** WTG and platforms: • Total seabed area for 180 WTG on GBS (WTG-type) foundations and associated scour protection footprint = 1,222,724 m^2. **Offshore platforms:** • Total seabed area for OSS in the array (three large OSS on GBS (large OSS) foundations and six small OSS on GBS (Box-type) foundations, including associated scour protection = 371,250 m2; and • Total seabed area for one offshore accommodation platform within the array on a small OSS foundation (GBS (Box-type)), including associated scour protection = 30,625 m2. **Offshore cables:** • Cable protection for array cables = 624,000 m2; • Cable protection for interconnector cables = 94,000 m2; and • Pre- and post-lay rock berm area for 32 cables crossings within the array area = 204,000 m2. **HVAC Offshore platforms:** • Total seabed area for three HVAC booster stations on small OSS GBS (Box-type) foundations, including associated scour protection = 91,875 m2. **HVAC Offshore cables:** • Cable protection for export cables = 792,000 m2; • Pre- and post-lay rock berm area for 54 cable crossings within the offshore ECC = 344,000 m2.	Parameters that create the greatest disruption to oil and gas drilling and installation activities, including oil and gas decommissioning in terms of area affected and duration.	Secondary: Co139 Tertiary: Co57 Co81 Co89 Co94 Co96 Co98 Co102 Co107	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-10	All Offshore	Operation and Maintenance	Hornsea Four infrastructure, safety zones and advisory safety distances may restrict access to the proposed Endurance CCS Site and associated infrastructure.	**Total permanent reduction:** **WTG and platforms:** • Total seabed area for 180 GBS (WTG type) foundations and associated scour protection footprint = 1,222,724 m^2; • Minimum turbine spacing of 810 m. • Total seabed area for OSS in the array (three large OSS on GBS (large OSS) foundations and six small OSS on GBS (Box-type) foundations, including associated scour protection = 371,250 m^2; and • Total seabed area for one offshore accommodation platform within the array on a small OSS foundation (GBS (Box-type), including associated scour protection = 30,625 m^2. **Offshore cables:** • Cable protection for array cables = 624,000 m^2; • Cable protection for interconnector cables = 94,000 m^2; and • Pre- and post-lay rock berm area for 32 cables crossings within the array area = 204,000 m^2.	Parameters that create the CCS activities in terms of area affected and duration.	Primary: Co201 Secondary: Co139 Tertiary: Co57 Co81 Co89 Co93 Co94 Co107	**Impact not identified at Scoping and therefore scoped out of PEIR**	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.3).	N/A	N/A	**No significant effect**	**Detailed Assessment**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.3). Impact re-considered in the ES following consultation and scoped in for assessment at ES. At the Scoping stage, it was noted that the proposed Endurance saline deposit reservoir overlaps in part with the northern part of the Hornsea Four array area and offshore extent of the offshore ECC. The Endurance reservoir was the identified CO^2 store for the White Rose CCS project being promoted by Capture Power Limited and National Grid Carbon Limited, to accept carbon produced by a proposed coal-fired power station at the existing Drax site in North Yorkshire. Development consent was refused for the power station project in 2016, together with an application for the connecting pipeline to the offshore CO^2 storage site which was refused in 2017. At the time of Scoping, there were no active CCS projects that would make use of the	Moderate	High	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
				<u>Temporary reduction from maintenance activities:</u> **WTG Activities:** • Component replacement = 378,000 m^2; • Access ladder replacement = 378,000 m^2; • Foundation anode replacement = 378,000 m^2; and • J-Tube repair/ replacement = 108,000 m^2. **Offshore substation and accommodation activities:** • Offshore substation component replacement = 6,000 m^2; • Access ladder replacement = 90,000 m^2; • Foundation anode replacement = 21,000 m^2; and • J-Tube repair/ replacement = 6,000 m^2. **Array cable activities:** • Remedial burial of array cables (42 km total length reburied) = 4,200,000 m^2; • Array cable repairs = 363,736 m^2; • Cable protection replacement = 156,000 m^2; • Ten array cable repair events over lifetime; and • Duration of each cable repair event: approximately three months. **Interconnector cable activities:** • Remedial burial of interconnector cables (7 km total length reburied) = 700,000 m^2; • Interconnector cable repairs = 20,028 m^2; • Cable protection replacement = 23,500 m^2; • Three interconnector cable repair events over lifetime; and • Duration of each cable repair event approximately three months. **ECC Activities:** • Remedial burial of export cables (14 km total length reburied) = 1,400,000 m^2; • Export cable repairs = 153,548 m^2; • Cable protection replacement = 198,000 m^2; and • Duration of each cable repair event: approximately three months **Safety Zones:** • 500 m safety zones around manned offshore platforms; and • Temporary 500 m safety zones around turbines and offshore platforms undergoing major maintenance. **Duration:** • Operational design life of 35 years.											Endurance reservoir and this impact was therefore scoped out of assessment. In May 2019, Drax Group, Equinor and National Grid Ventures signed a Memorandum of Understanding, committing to work together to explore opportunities for creating a zero carbon cluster in the Humber (now known as Zero Carbon Humber), utilising the Endurance reservoir. In parallel, in October 2019 the Applicant was approached by BP on behalf of Net Zero Teesside who are also looking to use the Endurance reservoir for CO^2 storage. Since then, consultation has been ongoing between the Applicant and both National Grid Ventures and BP regarding the two potential projects connecting into the Endurance reservoir. At the time of writing, no planning applications have been submitted in relation to these projects, with only Net Zero Teesside's onshore scheme listed on PINS Programme of Projects. Both projects are also in the early stages of development with only high-level information available.			
IOU-O-11	All Offshore	Operation and Maintenance	Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance.	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may restrict access to the proposed Endurance CCS Site and associated infrastructure (IOU-O-10)."	Parameters that create the greatest reduction in available sea room and the greatest disruption to vessel access in terms of area affected and duration.	<u>Secondary</u>: Co.139 <u>Tertiary</u>: Co 57 Co81 Co89 Co94 Co96 Co98 Co102	**No likely significant effect** Restriction of access to the pipelines for inspection and maintenance activities could be critical to the operator. The operators of active pipelines are deemed to be of medium vulnerability, medium recoverability and high value.	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-12	All Offshore	Operation and Maintenance	Anchor snagging or dropping from vessel traffic associated with Hornsea Four that may cause damage to existing pipelines and wells.	**<u>The presence of the installed Hornsea Four infrastructure:</u>** **Total of 1,693 return vessel trips per year:** • 180 WTGs utilising the entire array area (468 km^2); • 10 offshore platforms within the array area (up to six small OSS, three large OSS and one accommodation platform); • Three HVAC booster stations within the HVAC booster station area of search. **Total of 1,433 return vessel trips per year:** • 124 jack-up vessel trips; • 1,205 crew vessels wind turbine visits; and • 104 supply vessel accommodation platform visits. **Safety zones:** • 500 m safety zone around manned offshore platforms; and • Temporary 500 m safety zones around turbines and offshore platforms undergoing major maintenance. **Duration:** • Anticipated design life for Hornsea Four of 35 years.	Parameters that create the greatest reduction in available sea room and are most likely to give rise to potential interactions with existing pipelines and wells.	<u>Secondary</u>: Co139 <u>Tertiary</u>: Co107	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-13	All Offshore	Operation and Maintenance	Allision risk to oil and gas platforms due to vessels being deviated from existing routes due to the presence of Hornsea Four infrastructure	**Installed Hornsea Four infrastructure:** • WTGs and offshore platforms utilising the entire array area (468 km^2); and • Three HVAC booster stations within the HVAC booster station area of search **Safety zones:** • 500 m safety zones around infrastructure undergoing maintenance • Temporary 500 m safety zones around turbines and offshore platforms undergoing major maintenance. **Duration:** • Anticipated design life of 35 years	Parameters that create the greatest reduction in available sea room and are most likely to give rise to deviation of shipping from existing routes.	<u>Secondary</u>: Co139 <u>Tertiary</u>: Co81 Co89 Co93	**Impact not identified at Scoping**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-14	All Offshore	Operation and Maintenance	Proximity Hornsea Four infrastructure and associated works may restrict or hamper access to oil and gas platforms and subsurface infrastructure during certain periods (e.g., allowable weather).	As per MDS for "Allision risk to oil and gas platforms due to vessels being deviated from existing routes due to the presence of Hornsea Four infrastructure (IOU-O-13)."	Parameters that create the greatest disruption to vessel access in terms of area affected and duration.	<u>Secondary</u>: Co139 <u>Tertiary</u>: Co81 Co89 Co93	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-15	All Offshore	Operation and Maintenance	Wind turbines and associated works may result in deviations to routine support vessel routeing to oil and gas platforms.	As per MDS for "Allision risk to oil and gas platforms due to vessels being deviated from existing routes due to the presence of Hornsea Four infrastructure (IOU-O-13)."	As MDS justification above (Impact ID IOU-O-16).	<u>Secondary</u>: Co139 <u>Tertiary</u>: Co89 Co93 Co94	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
IOU-O-16	Array Area	Operation and Maintenance	The presence of new wind turbines in previously open sea areas may cause interference with the performance of the REWS located on oil and gas platforms.	**The presence of the installed Hornsea Four infrastructure within the array area:** • 180 WTG utilising the entire array area (468 km^2) • Up to 10 offshore platforms within the array area (up to six OSS, three convertor substations and one accommodation platform) **The wind turbine dimensions are as follows:** • 42.43 m minimum height of lowest blade tip above LAT • 370 m maximum blade tip height above LAT • 305 m maximum rotor blade diameter **Duration:** • Anticipated design life of 35 years.	Parameters that present the greatest radar cross section.	Tertiary: Co89 Co93	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-17	Array Area	Operation and Maintenance	The presence of new wind turbines in previously open sea areas will deviate vessels which may cause a change in CPA and TCPA alarms on oil and gas platforms equipped with REWS.	As per MDS for "The presence of new wind turbines in previously open sea areas may cause interference with the performance of the REWS located on oil and gas platforms (IOU-O-16)."	Parameters that create the greatest number of turbines with the greatest radar cross section.	Tertiary: Co89 Co93	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-18	All Offshore	Operation and Maintenance	Hornsea Four infrastructure and associated works may restrict or hamper helicopter access to oil and gas platforms	**The presence of the installed Hornsea Four infrastructure within the array area:** • 180 WTG utilising the entire array area (468 km^2) • 10 offshore platforms within the array area (up to six OSS, three convertor substations and one accommodation platform) **The wind turbine dimensions are as follows:** • 42.43 m minimum height of lowest blade tip above LAT • 370 m maximum blade tip height above LAT • 305 m maximum rotor blade diameter • Minimum turbine spacing of 810 m. **Offshore platforms within the Array Area:** • A single accommodation platform with max height 64 m above LAT; • Six small platforms with a height of 90 m; and • Three large offshore platforms with height of 100 m LAT **Duration:** • Anticipated design life of 35 years.	The maximum number of wind turbines and other structures within the array area affecting the operation of helicopters approaching or departing from oil and gas platforms.	Tertiary: Co99	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-19	All Offshore	Operation and Maintenance	Hornsea Four infrastructure and associated works may restrict or hamper helicopter access to oil and gas vessels	**The presence of the installed Hornsea Four infrastructure within the Array Area:** • Up to 180 WTGs utilising the entire array area (468 km^2); • Up to 10 offshore platforms within the array area (up to six small OSS, three large OSS and one accommodation platform) **The wind turbine dimensions are as follows:** • 42.43 m minimum height of lowest blade tip above LAT • 370 m maximum blade tip height above LAT • 305 m maximum rotor blade diameter • Minimum turbine spacing of 810 m. **Offshore platforms within the Array Area:** • A single accommodation platform with max height 64 m above LAT; • Six small platforms with a height of 90 m; and • Three large offshore platforms with height of 100 m LAT **The presence of the installed HVAC Booster Stations:** • Three HVAC substations with height of 100 m LAT • Minimum spacing of 100 m. **Duration:** • Anticipated design life of 35 years	As above in relation to helicopter access to oil and gas vessels.	Tertiary: Co99	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-20	All Offshore	Operation and Maintenance	Hornsea Four infrastructure, safety zones, advisory safety distances and piling may restrict or cause acoustic interference with potential seismic survey activity	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may restrict access to the proposed Endurance CCS Site and associated infrastructure (IOU-O-10)".	Parameters that create the greatest disruption to seismic survey activities in terms of area affected and duration.	Secondary: Co139 Tertiary: Co57 Co89	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-21	All Offshore	Operation and Maintenance	Drilling and the installation of oil and gas infrastructure has the potential to be restricted by the presence of Hornsea Four infrastructure, safety zones and advisory safety distances	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may restrict access to the proposed Endurance CCS Site and associated infrastructure (IOU-O-10)".	Parameters that create the greatest disruption to oil and gas drilling and installation activities in terms of area affected and duration.	Secondary: Co139 Tertiary: Co57 Co81 Co89	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-O-22	Array Area	Operation and Maintenance	Impact of physical presence of wind turbines in Hornsea Four array area on microwave links.	As per MDS for "The presence of new wind turbines in previously open sea areas may cause interference with the performance of the REWS located on oil and gas platforms (IOU-O-16)."	Parameters that create the greatest number of turbines with the greatest radar cross section.	Tertiary: Co89 Co93	**Impact not identified at Scoping**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
IOU-D-23	All Offshore	Decommissioning	Hornsea Four infrastructure, safety zones and advisory safety distances may restrict access to the proposed Endurance CCS Site and associated infrastructure.	In the absence of detailed methodologies and schedules, decommissioning works and associated implications for access to existing subsea cables for repairs and maintenance are considered analogous with those assessed for the construction phase. • Decommissioning of 180 WTG • Decommissioning of 10 offshore platforms within the array area (six small OSS, three convertor substations and one accommodation platform) • Decommissioning of six export cables • Removal of cables utilising the entire offshore ECC **Safety zones:** • 500 m safety zone around infrastructure being decommissioned **Duration:** • Decommissioning period of 3 years.	Parameters that create the CCS activities in terms of area affected and duration.	Secondary: Co139 Tertiary: Co57 Co81 Co89 Co93 Co94 Co107 Co181	**Impact not identified at Scoping and therefore scoped out of PEIR**	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.3).	N/A	N/A	**No significant effect**	**Detailed Assessment**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.3). Impact re-considered in the ES following consultation and scoped in for assessment at ES. At the Scoping stage, it was noted that the proposed Endurance saline deposit reservoir overlaps in part with the northern part of the Hornsea Four array area and offshore extent of the offshore ECC. The Endurance reservoir was the identified CO^2 store for the White Rose CCS project being promoted by Capture Power Limited and National Grid Carbon Limited, to accept carbon produced by a proposed coal-fired power station at the existing Drax site in North Yorkshire. Development consent was refused for the power station project in 2016, together with an application for the connecting pipeline to the offshore CO^2 storage site which was refused in 2017. At the time of Scoping, there were no active CCS projects that would make use of the Endurance reservoir and this impact was therefore scoped out of assessment. In May 2019, Drax Group, Equinor and National Grid Ventures signed a Memorandum of Understanding, committing to work together to explore opportunities for creating a zero carbon cluster in the Humber (now known as Zero Carbon Humber), utilising the Endurance reservoir. In parallel, in October 2019 the Applicant was approached by BP on behalf of Net Zero Teesside who are also looking to use the Endurance reservoir for CO^2 storage. Since then, consultation has been ongoing between the Applicant and both National Grid Ventures and BP regarding the two potential projects connecting into the Endurance reservoir. At the time of writing, no planning applications have been submitted in relation to these projects, with only Net Zero Teesside's onshore scheme listed on PINS Programme of Projects. Both projects are also in the early stages of development with only high-level information available.	Moderate	High	**No significant effect (not significant)**
IOU-D-24	All Offshore	Decommissioning	Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance.	In the absence of detailed methodologies and schedules, decommissioning works and associated implications for access to existing pipelines and wells for repairs and maintenance are considered analogous with those assessed for the construction phase. • Decommissioning of 180 WTG • Decommissioning of 10 offshore platforms within the array area (six small OSS, three convertor substations and one accommodation platform) • Decommissioning of three HVAC substations • Decommissioning of six export cables • Removal of cables utilising the entire offshore ECC **Safety zones:** - 500 m safety zone around infrastructure being decommissioned **Duration:** - Decommissioning period of 3 years.	Parameters that create the greatest reduction in available sea room and the greatest disruption to vessel access in terms of area affected and duration.	Secondary: Co139 Tertiary: Co 57 Co89 Co94 Co96 Co98 Co102 Co107 Co181	**No likely significant effect** Restriction of access to the Viking Link for inspection and maintenance activities could be critical to the operator. The operators of active pipelines and cables are deemed to be of medium vulnerability, medium recoverability and high value.	**Scoped Out**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.4).	N/A	N/A	**No significant effect**	**Detailed Assessment**	Scoped out based on PINS Scoping Opinion (PINS Scoping Opinion, November 2018, ID: 4.12.4). Impact re-considered in the ES following consultation and scoped in for assessment at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-D-25	All Offshore	Decommissioning	Anchor snagging or dropping from vessel traffic associated with Hornsea Four that may cause damage to existing pipelines and wells	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance (IOU-D-24)."	Parameters that create the greatest reduction in available sea room and are most likely to give rise to potential interactions with existing pipelines and wells.	Secondary: Co139 Tertiary: Co107 Co181	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-D-26	All Offshore	Decommissioning	Allision risk to oil and gas platforms due to vessels being deviated from existing routes due to the presence of partially decommissioned Hornsea Four infrastructure.	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance (IOU-D-24)."	Parameters that create the greatest reduction in available sea room and are most likely to give rise to deviation of shipping from existing routes.	Secondary: Co139 Tertiary: Co81 Co89 Co93 Co181	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-D-27	All Offshore	Decommissioning	Proximity to Hornsea four infrastructure partially decommissioned and associated decommissioning works may restrict or hamper access to oil and gas platforms and subsurface infrastructure during certain periods	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance (IOU-D-24)."	Parameters that create the greatest disruption to vessel access in terms of area affected and duration.	Secondary: Co139 Tertiary: Co81 Co89 Co93 Co181	**Impact not identified at Scoping**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-D-28	All Offshore	Decommissioning	Wind turbines and associated works may result in deviations to routine support vessel routeing to oil and gas platforms.	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance (IOU-D-24)."	As MDS justification above (Impact ID IOU-D-29)	Secondary: Co139 Tertiary: Co89 Co93 Co94 Co181	**Impact not identified at Scoping**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**
IOU-D-29	All Offshore	Decommissioning	Hornsea Four infrastructure, safety zones, advisory safety distances and piling may restrict or cause acoustic interference with potential seismic survey activity	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance (IOU-D-24)."	Parameters that create the greatest disruption to seismic survey activities in terms of area affected and duration.	Secondary Co139 Tertiary: Co89 Co181	**No likely significant effect**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
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IOU-D-30	All Offshore	Decommissioning	Drilling and the installation of oil and gas infrastructure has the potential to be restricted by the presence of Hornsea Four infrastructure, safety zones and advisory safety distances	As per MDS for "Hornsea Four infrastructure, safety zones and advisory safety distances may lead to a temporary impact upon access to existing pipelines and wells for repairs and maintenance (IOU-D-24)."	Parameters that create the greatest disruption to oil and gas drilling and installation activities in terms of area affected and duration.	Secondary: Co139 Tertiary: Co89 Co181	**Impact not identified at Scoping**	**To be assessed for final Application**	N/A	N/A	N/A	N/A	**Detailed Assessment**	Assessment not included at PEIR - new assessment undertaken at ES.	N/A	N/A	**No significant effect (not significant)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
GGC-C-1	Landfall	Construction	**Damage to designated geological SSSIs: Construction phase** Any ground breaking activities that directly overlap with them could affect geological designated SSSIs.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Primary: Co2	**No likely significant effects (Magnitude - Negligible, Sensitivity - High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.1.3.2). The Hornsea Four geology and ground conditions study area includes the Hornsea Four Order Limits, plus a 250 m buffer (hereafter referred to as the 250 m Hornsea Four geology and ground conditions study area) for direct impacts, and a 1 km buffer (hereafter referred to as the 1 km Hornsea Four geology and ground conditions study area) for indirect impacts related to Hornsea Four. The Hornsea Four Envirocheck Report (**Volume A6, Annex 1.2: Envirocheck Report (Part 1 to Part 8)**) confirms that the Hornsea Four geology and ground conditions study area is not located within a geological SSSI. As such no significant direct or indirect impacts to designated geological sites are predicted to occur. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 1: Geology and Ground Conditions**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	A desk-based review of the existing environment in relation to the presence of geological SSSIs to inform both the PEIR and ES chapters has identified that there are no geological SSSIs present within the 1 km Hornsea Four geology and ground conditions study area. PINS requested at the scoping stage (November, 2018), that if significant effects were likely to occur to geological SSSIs then they should be assessed. However, due to the absence of geological SSSIs located within the 1 km Hornsea Four geology and ground conditions study area, no significant effects are considered likely and so effects on geological SSSIs have not been assessed within the ES chapter. This approach has been agreed with the relevant stakeholders (ERYC & EA) (ON-ECO-1.1).	N/A	N/A	**No Significant Effect**
GGC-C-2	All - Onshore	Construction	**Indirect Effects: Damage to designated geological SSSIs: Construction phase** Any ground breaking activities that directly overlap with them could affect geological designated SSSIs.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	N/A	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.1.3.2). The Hornsea Four geology and ground conditions study area includes the Hornsea Four Order Limits, plus a 250 m buffer (hereafter referred to as the 250 m Hornsea Four geology and ground conditions study area) for direct impacts, and a 1 km buffer (hereafter referred to as the 1 km Hornsea Four geology and ground conditions study area) for indirect impacts related to Hornsea Four. The Hornsea Four Envirocheck Report (**Volume A6, Annex 1.2: Envirocheck Report (Part 1 to Part 8)**) confirms that the 1 km Hornsea Four geology and ground conditions study area is not located within a geological SSSI. As such no significant direct or indirect impacts to designated geological sites are predicted to occur. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 1: Geology and Ground Conditions**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	A desk-based review of the existing environment in relation to the presence of geological SSSIs to inform both the PEIR and ES chapter has identified that there are no geological SSSIs within 1 km of the Hornsea Four Order Limits that may be indirectly effected by the onshore elements of Hornsea Four. This approach has been agreed with the relevant stakeholders (ERYC & EA) (ON-ECO-1.1).	N/A	N/A	**No Significant Effect**
GGC-O-3	All - Onshore	Operational	**Sterilisation of future mineral resources: Operational phase** Where overlaps occur between the permanent ECC and regional geological sites and/or minerals safeguarding areas this could sterilise future resources.	**Landfall:** • HDD cable ducts: Number: 8, Diameter: 1m, Length: 1.5 km • HDD Entry Pits: Area: 125 m2 per entry pit, Depth: 6 m • HDD burial depth: Maximum: 40 m, Minimum: 5 m • HDD Exit Pits: Number: 8, Area: 900 m2 per exit pit, Depth: 5 m • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit • Simultaneous HDDs: Number: 3 **ECC Infrastructure:** • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Distance between Joint Bay/ Link Box Minimum: 750 m, Maximum: 3,000 m • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m **Onshore substation:** • Permanent infrastructure area: 164,000 m2 • Permanent access road: Number 1; Length 1, 800 m; Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities).	These parameters represent the maximum footprint, and therefore the maximum reduction in mineral resource areas, of onshore infrastructure during the operation of Hornsea Four.	Primary: Co2 Tertiary: Co7 Co10	**Likely significant effects without mitigation**	**Detailed Assessment**	No LSE with regards to mineral sterilisation were identified within the PEIR. The magnitude is minor due to the relatively small area of mineral safeguarding that will be impacted when compared to the wider ERYC mineral safeguarding area. The sensitivity of the receptor is Medium due to the regional importance.	Minor	Medium	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	A desk-based review identified the presence of Mineral Safeguarding Areas within the Hornsea Four Order Limits. It was calculated that 0.13% of the total Mineral Safeguarding Area within the East Riding of Yorkshire Council jurisdiction is located within the Hornsea Four Order Limits, with 0.07% of the total Mineral Safeguarding Area within the ERYC jurisdiction located within the onshore ECC. Following a review of the available data, it was concluded within the PEIR assessment that there was no likely significant effect on Mineral Safeguarding Areas during the operational phase and therefore they have not been considered within the ES chapter. This approach has been sent to the relevant stakeholder (ERYC) via draft submission documentation for review.	N/A	N/A	**No Significant Effect**
GGC-C-4	All - Onshore	Construction	**Exposure of workforce to health impacts: Construction phase** Construction activities (all project components), such as trenching, excavations and other earthworks could disturb contaminants where present, which could result in health risks to construction workers	**Landfall:** • Construction duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth 6 m • HDD cable ducts: Number: 8, Diameter: 1m, Length: 1.5 km • HDD Entry Pits: Area: 125 m2 per entry pit, Depth: 6 m • HDD burial depth: Maximum: 40 m, Minimum: 5 m • HDD Exit Pits: Number: 8, Area: 900 m2 per exit pit, Depth: 5 m • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit • Simultaneous HDDs: Number: 3 **Onshore Export Cable Corridor:** • Construction duration: 30 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m	These parameters represent the maximum ground disturbance within the project area in which the potential disturbance of existing contamination could occur. They also represent the maximum construction duration which could affect human health of the construction workforce.	Primary Co1 Co41 Tertiary: Co4 Co76 Co77 Co124	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - High)**	**Simple Assessment**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.13.3) Following receipt of the PINS scoping opinion, an assessment of the impacts relating to the exposure of workforce to health impacts during the construction phase was scoped into the Geology and Ground Conditions PEIR chapter.	Minor	High	**No Significant Effect (Moderate adverse prior to further mitigation, minor adverse following further mitigation)**	**Simple assessment**	Potential sources of contamination both within the Hornsea Four Order Limits and within 250 m of the Hornsea Four Order Limits were identified as part of a Phase 1 Preliminary Risk Assessment (PRA) (**Volume A6, Annex 1.1: Land Quality Preliminary Risk Assessment**) and discussed in detail in the PEIR assessment. Impacts on human health receptors were evaluated as part of the PEIR chapter; and specific mitigation measures is included as part the CoCP (Co124) to reduce the potential for adverse impacts to human health, including for example the implementation of a Pollution Prevention Plan (Co4) and following the Environment Agency's Pollution Prevention Guidance (including PPG01, PPG05, PPG08 and PPG21). The impact assessment following this implementation was considered to be moderate adverse. As such further mitigation measures were recommended as part of the impact assessment within the PEIR. These additional mitigation measures included a post consent ground investigation to target known potential sources of contamination identified during the production of the PRA (Co77) to enable appropriate mitigation measures to be identified and the use of appropriate Personal Protection Equipment (PPE) (Co76). Following the implantation of additional mitigation measures the impact was reduced to negligible. Due to the need to incorporate further mitigation measures the impacts on human health have been included within the ES chapter (**Volume A3, Chapter 1: Geology and**	Minor	High	**No Significant Effect (Slight Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
				• Approximate Length: 1 km • Width: 60 m **Onshore substation:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) • Permanent access road: Number 1, Length: 1,800 m, Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities).											Ground Conditions).			
GGC-C-5	All - Onshore	Construction	**Encountering contamination during intrusive works: Construction phase** Construction activities (all project components), such as trenching, excavations and other earthworks could disturb contaminants, which could result in impacts on soil / land use; and pollution of groundwater.	**Landfall:** • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth 6 m • HDD cable ducts: Number: 8, Diameter: 1m, Length: 1.5 km • HDD Entry Pits: Area: 125 m2 per entry pit, Depth: 6 m • HDD burial depth: Maximum: 40 m, Minimum: 5 m • HDD Exit Pits: Number: 8, Area: 900 m2 per exit pit, Depth: 5 m • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit • Simultaneous HDDs: Number: 3 **Onshore Export Cable Corridor:** • Construction duration: 30 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Joint Bays: Number: 240, Depth 2.5 m, Area: 225 m2 per Joint Bay, Joint Bay compounds: 240 40x40 m compounds • Link Boxes: Number: 240, Depth: 2 m, Area: 9 m2 per Link Box • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Distance between Joint Bay/ Link Box: Minimum: 750 m, Maximum: 3,000 m • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m **Onshore substation:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1; Length: 1,800 m; Width: 15m (7m road, 8m soil storage) • Permanent access road: Number 1; Length: 1,800 m; Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). • Foundations: 500 pre-cast or Continuous Flight Auger piles.	These parameters represent the maximum ground disturbance within the project area in which the potential disturbance of existing contamination could occur during the construction phase.	Primary Co1 Tertiary: Co6 Co64 Co65 Co77 Co124	**Likely significant effects without mitigation**	**Simple Assessment**	N/A as impact scoped in	Minor	High	**No Significant Effect (Moderate adverse prior to further mitigation, minor adverse following further mitigation)**	**Simple assessment**	Potential sources of contamination both within the Hornsea Four Order Limits and within 250m of the order limits were identified as part of the Phase 1 PRA and discussed in detail within the PEIR chapter. Following this the implementation of mitigation (Co77) secured via the Outline CoCP (**Volume F2, Chapter 2: Outline Code of Construction Practice**), the impact is reduced to negligible significance. Due to the need to incorporate further mitigation measures, the impacts from encountering contamination during intrusive works has been included within the ES chapter (**Volume A3, Chapter 1: Geology and Ground Conditions**).	Minor	High	**No Significant Effect (Slight Adverse)**
GGC-C-6	Onshore ECC	Construction	**Soil compaction: Construction phase** Construction vehicle movements and the creation of haul routes could cause compaction of the subsoil, which would degrade soil quality.	N/A as impact scoped out.	N/A as all effects scoped out.	Secondary Co41 Co61 Co68 Tertiary: Co10 Co64	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Low to High)**	**Scoped out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.13.4).	N/A	N/A	**No Significant Effect**	**Scoped Out**	No LSE were determined during the scoping stage with agreement from PINS during EIA Scoping (November 2018, ID:4.13.4), as such the Applicant and Stakeholders agreed at Scoping that impact can be "Scoped Out". This approach has been sent to the relevant stakeholder (ERYC) via draft submission documentation for review.	N/A	N/A	**No Significant Effect**
GGC-C-7	Onshore ECC	Construction	**Dewatering of trenches and excavations: construction phase** If required, dewatering perched water or groundwater could reduce groundwater flow and affect water quality and base flow of local watercourses and abstractions.	**Onshore Export Cable Corridor:** • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	These parameters represent the maximum ground disturbance conditions associated with the onshore ECC.	Tertiary: Co4 Co14 Co19 Co124	**Likely significant effects without mitigation**	**Simple Assessment**	With the inclusion of the embedded mitigation measures outlined as part of the project design, the impact is predicted to be of local spatial extent, of short-term duration, intermittent occurrence and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be negligible. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant.	Negligible	N/A	**No Significant Effect (Not Significant)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	Whilst there is the possibility that the local hydraulic regime may be altered as a result of construction, the Applicant has committed to installing drainage channels either side of the onshore ECC to ensure that direct impacts to the hydraulic regime are not altered, (see **Volume F2, Chapter 6: Outline Onshore Infrastructure Drainage Strategy**) to be developed in consultation with the Environment Agency and LLFA/IDB as appropriate (Co19). The Onshore Infrastructure Drainage Strategy will be used alongside the most relevant PPG available at the time (Co4). Prior to discharge to watercourses, water from temporary discharge will be passed through a treatment system such as a silt interceptor (**Volume F2, Chapter 6**). Appropriate licences relating to dewatering will be obtained from the relevant bodies (EA, LLFA, IDB). **Volume F1, Chapter 5: Consents Management Plan** includes details of other consent and licences relevant to Hornsea Four. Impacts on the hydraulic regime of the local area was assessed in the PEIRas part of the EIA, as set out in the PEIR and confirmed in the impact register, and no likely significant effect was identified (Volume A4, Annex 5.1: Impacts Register) and the assessment concluded that the impacts were not significant and so not considered further in the ES chapter. This approach has been sent to with the relevant stakeholders (ERYC) via draft submission documentation for review.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
GGC-C-8	All - Onshore	Construction	**Physical intrusion into groundwater resource: Construction phase** Installation of foundations, ground preparation, below ground works and associated activities could lead to potential contamination of underlying groundwater resources.	**Landfall:** • Construction duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth 6 m • HDD cable ducts: Number: 8, Diameter: 1m, Length: 1.5 km • HDD Entry Pits: Area: 125 m2 per entry pit, Depth: 6 m • HDD burial depth: Maximum: 40 m, Minimum: 5 m • HDD Exit Pits: Number: 8, Area: 900 m2 per exit pit, Depth: 5 m • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit • Simultaneous HDDs: Number: 3 **Onshore Export Cable Corridor:** • Construction duration: 30 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • HDDs: Number: 112 **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m **Onshore Substation:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Foundations: 500 pre-cast or Continuous Flight Auger piles.	These parameters represent the maximum ground disturbance conditions both in terms of potential area affected and in duration.	Tertiary: Co4 Co6 Co14 Co76 Co77 Co124	**Likely significant effects without mitigation**	**Simple Assessment**	With the inclusion of the embedded mitigation measures outlined as part of the project design, the impact is predicted to be of local spatial extent, of short-term duration, intermittent occurrence and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be negligible. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant.	Negligible	N/A	**No Significant Effect (Not Significant)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	Whilst there is the potential for contaminative sources to be introduced to the Principal Aquifer via piling activities (as detailed in the PEIR assessment), a commitment has been made to adhere to the 'Piling and Penetrative Ground Improvement Methods on land Affected by Contamination: Guidance on Pollution Prevention (Environment Agency, 2001) or the latest relevant guidance (Co6) to minimise significant effects during construction. Following the implementation of the embedded mitigation measures detailed in the PEIR assessment, the impacts on groundwater resources due to physical intrusion was assessed as being no LSE and therefore has not been considered within the ES chapter (**Volume A3, Chapter 1: Geology and Ground Conditions**). This approach has been sent to with the relevant stakeholders (ERYC) via draft submission documentation for review.	N/A	N/A	**No Significant Effect**
GGC-C/O-9	All - Onshore	Construction and Operation	**Accidental spills: construction and Operation phase** During both construction and operation, there exists the potential for accidental oil / fuel / hazardous substance spills from vehicles, contaminative equipment, storage containers / tanks and during maintenance operations (e.g. lubrication of electrical equipment). to contaminate the ground and groundwater, impacting the quality of local groundwater resources	N/A as impact scoped out.	N/A as impact scoped out.	Tertiary: Co4 Co6 Co8 Co13 Co65 Co77 Co124	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Low to High)**	**Scoped out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.13.5).	N/A	N/A	**No Significant Effect**	**Scoped Out**	No LSE were determined during the scoping stage with agreement from PINS during EIA Scoping (November 2018, ID:4.13.5), as such an agreement between Hornsea Four and Stakeholders agreed at Scoping that impact can be "Scoped Out". This approach has been sent to with the relevant stakeholders (ERYC) via draft submission documentation for review.	N/A	N/A	**No Significant Effect**
GGC-D-10	All - Onshore	Decommissioning	**Decommissioning** The impacts during decommissioning will be similar, and potentially less than outlined for the construction phase for the OnSS. The assumption is that the underground cables will be left in situ and as such there will be no effects along the onshore ECC.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary: Co127	**No likely significant effects** **(Magnitude and Sensitivity not defined at Scoping)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (ID:4.13.7 & 4.13.8). Decommissioning of the onshore infrastructure for Hornsea Four will comprise: • Buried export cables left in situ, with cable ends cut, sealed and securely buried. Partial removal of cables at landfall occur for aluminium/steel recycling; • Joint Bays and Link boxes will typically be left in situ, or removed if environmentally feasible; and • The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. Any waste arising from the decommissioning will be disposed of in accordance with the relevant regulations. The site will be returned to its previous condition. All project mitigation and commitments apply for decommissioning and a decommissioning plan will be developed in line with the latest relevant available guidance (Co127). Further details will be provided and secured within a Decommissioning Plan, that will be submitted and agreed with stakeholders prior to the commencement of any decommissioning activities. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four.	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	No LSE were determined during the scoping stage, as such an agreement between Hornsea Four and Stakeholders agreed at Scoping that impact can be "Scoped Out". This approach has been sent to with the relevant stakeholders (ERYC and EA) via draft submission documentation for review.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
GGC-C-11	All - Onshore	Construction	**Impacts on groundwater resources: Construction phase** Underground works along the cable route and at the project substation (e.g. HDD, deep excavations, piling) could introduce new contaminants into groundwater	**Landfall:** • Construction duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth 6 m • HDD cable ducts: Number: 8, Diameter: 1m, Length: 1.5 km • HDD Entry Pits: Area: 125 m2 per entry pit, Depth: 6 m • HDD burial depth: Maximum: 40 m, Minimum: 5 m • HDD Exit Pits: Number: 8, Area: 900 m2 per exit pit, Depth: 5 m • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit • Simultaneous HDDs: Number: 3 **Onshore Export Cable Corridor:** • Construction duration: 30 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40 m compounds • Link Boxes: Number: 240, Depth: 2 m, Area: 9 m2 per Link Box • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • HDDs: Number: 112 **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5 m • Approximate Length: 1 km • Width: 60 m **Onshore Substation:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Foundations: 500 pre-cast or Continuous Flight Auger piles.	These parameters represent the greatest number and depth of underground works associated with the onshore ECC and OnSS.	Secondary Co187 Tertiary: Co6 Co13 Co18 Co77	**Impact not identified at Scoping**	**Scoped in**	With the inclusion of the embedded mitigation measures outlined (notably Co77) as part of the project design, the impact of HDD, deep excavations and / or piling are predicted to be of local spatial extent, short term duration, intermittent occurrence and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be negligible. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant.	Negligible	N/A	**No Significant Effect (Not Significant)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	Although there is the potential for direct impacts to groundwater resources during the construction phase of Hornsea Four, through the introduction of contamination via deep excavations, embedded mitigation (e.g. Co77) will be in place to protect groundwater resources and avoid significant effects during the construction phase. Following the implementation of the embedded mitigation measures the impacts on groundwater resources due to deep excavations was assessed as being no LSE and therefore has not been considered within the ES chapter (**Volume A3, Chapter 1: Geology and Ground Conditions**). This approach has been sent to with the relevant stakeholders (ERYC) via draft submission documentation for review.	N/A	N/A	**No Significant Effect**
N/A	Landfall - Offshore	All	**Damage to the coastline and impacts on coastal erosion: Construction phase** This impact has been assessed in **Volume A2, Chapter 1: Marine Geology, Oceanography and Physical Processes.** Refer to impacts **MP-C-2** and **MP-O-6** in the **'Marine Processes'** sheet within this Impacts Register.	N/A as this impacts has been addressed in the **'Marine Processes'** sheet within this Impacts Register.	N/A as this impacts has been addressed in the **'Marine Processes'** sheet within this Impacts Register.	N/A as this impacts has been addressed in the **'Marine Processes'** sheet within this Impacts Register.	N/A as this impacts has been addressed in the **'Marine Processes'** sheet within this Impacts Register.	N/A as this impacts has been addressed in the **'Marine Processes'** sheet within this Impacts Register.	N/A as this impact has been addressed in the **'Marine Processes'** sheet within this Impacts Register.	N/A	N/A	**N/A**	**N/A**	N/A	N/A	N/A	**N/A**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
HFR-C-1	Onshore ECC	Construction	**Disturbance of watercourses: Construction phase** Works associated with cable crossings Main Rivers and IDB maintained watercourses may result in a reduction in water quality and channel hydro-morphology.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Primary Co1 Co25 Co28 Co41 Secondary Co18 Co143 Co170 Co187 Tertiary Co65 Co124 Co147 Co186	**No likely significant effects (Magnitude - No change, Sensitivity - High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.1.4.2). Trenchless techniques will be adopted to cross all major watercourses along the cable route including main rivers, IDB drains (Co1, Co41). The entry and exit points will be located at least 9 m away from surface watercourses and the cabling will be installed at least 1.2 m beneath the watercourses (Co18) to minimise the likelihood of interaction. Where Hornsea Four may cross sites of particular sensitivity (e.g. SSSIs) a pre-construction hydrogeological risk assessment will be undertaken to inform a site-specific risk assessment (Co18). As such, there will therefore be no mechanisms for the direct disturbance of these watercourses during construction. Furthermore, the stability of the watercourses (as described in Section 2.7.2 of **Volume A3, Chapter 2: Hydrology and Flood Risk**) means that rates of lateral or vertical adjustment are unlikely to be sufficient to result in direct interactions with buried cable infrastructure in the future. The magnitude is No Change (negligible using updated definitions) as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 2:**	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of commitments Co1, Co18, Co41, Co143, Co147, Co170 and Co186 the direct disturbance of Main River and IDB-maintained watercourses during construction was scoped out of the PEIR because no likely significant effects were identified at the scoping stage. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.4), and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-C-2	Onshore ECC	Construction	**Access across watercourses: Construction phase** Works associated with access track crossings of Main Rivers and IDB maintained watercourses may result in a reduction in water quality and channel hydro-morphology.	**Onshore ECC Construction Activities:** • Construction duration: 30 months **Onshore ECC:** • Type of temporary watercourse crossing: Clear-span/Bailey bridge (EA Main River), Culvert (Ordinary Watercourses) • Maximum number of temporary watercourse crossings: 31 • Location of temporary watercourse crossings: See Figure 2.10 - Figure 2.14 in **Volume A3, Chapter 2: Hydrology and Flood Risk**). • Length of temporary crossings: 10 m • Width of temporary crossings: 6 m	These parameters represent the maximum potential for disturbance of surface watercourses from temporary crossings. The scale of impacts resulting from watercourse crossings is a product of the number of trenched crossings per catchment and the spatial extent and duration of disturbance.	Secondary Co172 Co175 Co187 Tertiary Co13 Co124 Co147 Co186	**Negligible / Minor - No likely significant effects**	**Simple Assessment**	N/A as impact scoped in	Negligible to Moderate	Low to High	**LSE on Lowthorpe/Kelk/Foston Beck (Minor Adverse prior to mitigation, Not Significant following further mitigation)** **LSE on West Beck (Moderate Adverse prior to mitigation, Minor Adverse following further mitigation, but noting that interaction would be limited to tributaries and not the designated channel)** **No Significant Effect on Earl's Dyke, Gransmoor Drain, Barmston Drain, Skipsea Drain, Frodingham Beck, Scurf Dike, Watton Beck, Scorborough Beck, Beverley and Barmston Drain and High Hunsley (Not Significant to Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As a result of commitment Co13, Co124, Co147, Co172, Co175 and Co186, no likely significant effects resulting from temporary access across watercourses during construction were identified in the PEIR assessment following mitigation, taking into account the lack of direct impact on Lowthorpe/Kelk/Foston Beck and West Beck. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019(ON-HYD-3.5), and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-C-3	Onshore ECC	Construction	**Disturbance of minor drainage ditches: Construction phase** Works associated with cable crossings of minor drainage ditches (as defined in the watercourses crossing schedule and agreed with EA, IDB and LLFA) may result in a reduction in water quality and channel hydro-morphology.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Secondary Co157 Co172 Co187 Tertiary Co14 Co19 Co124 Co147 Co186	**No likely significant effects (Magnitude - Small, Sensitivity - Low-Medium)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.1.4.3 and ID.4.1.4.10). Minor drainage features will be crossed using an open trench technique following a methodology agreed in advance with the relevant consenting authority and developed in consultation with land owners once detailed land drainage surveys have been undertaken (Co14 and Co19). This will include details of the temporary works, including measures to maintain flows and reinstate the bed and banks of the watercourse. This is secured through the Outline Code of Construction Practice (Co124). All ditches and drainage outfalls will be retained where possible, and where it is not possible to retain them they will be repaired and reinstated (Co157). The bed and banks of watercourses will instated to their pre-construction condition (Co172). These will prevent non-temporary effects on minor drainage features. The magnitude is considered to be Negligible due to the mitigation set out above. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (Volume	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of commitments Co14, Co19, Co124, Co147, Co172 and Co186, the direct disturbance of minor ordinary watercourses during construction was scoped out of the PEIR because no likely significant effects were identified at the scoping stage. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.4) and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
HRF-C-4	Onshore ECC	Construction	**Access across minor drainage ditches: Construction phase** Works associated with access track crossings of minor drainage ditches (as defined in the watercourses crossing schedule and to be agreed with EA, IDB and LLFA) may result in a reduction in water quality and channel hydro-morphology.	**Onshore ECC Construction Activities:** • Construction duration: 30 months **Onshore ECC:** • Type of temporary watercourse crossing: Culvert • Maximum number of temporary watercourse crossings : 31 • Location of temporary watercourse crossings: See Figure 2.10 - Figure 2.14 in Volume A3, Chapter 2: Hydrology and Flood Risk). • Length of temporary crossings: 10 m • Width of temporary crossings: 6 m	These parameters represent the maximum potential for disturbance of minor drainage features. The scale of impacts resulting from watercourse crossings is a product of the number of trenched crossings per catchment and the spatial extent and duration of disturbance.	Secondary Co172 Tertiary Co13 Co124 Co147 Co186	**No likely significant effects (Magnitude - Small, Sensitivity - Low-Medium)**	**Simple Assessment**	Scoped into assessment at PEIR based on PINS scoping opinion (PINS Scoping Opinion, November 2018, ID:4.14.10).	Negligible to Moderate	Low to High	**LSE on Lowthorpe/Kelk/Foston Beck (Minor Adverse prior to mitigation, Not Significant following further mitigation)** **LSE on West Beck (Moderate Adverse prior to mitigation, Minor Adverse following further mitigation, but noting that interaction would be limited to tributaries and not the designated channel)** **No Significant Effect on Earl's Dyke, Gransmoor Drain, Barmston Drain, Skipsea Drain, Frodingham Beck, Scurf Dike, Watton Beck, Scorborough Beck, Beverley and Barmston Drain and High Hunsley (Not Significant to Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As a result of commitment Co172, no likely significant effects resulting from temporary access across minor ordinary watercourses during construction were identified in the PEIR assessment following mitigation, taking into account the lack of direct impact on Lowthorpe/Kelk/Foston Beck and West Beck. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.5), and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-C-5	Onshore ECC	Construction	**Disruption of local land drainage: Construction phase** Works associated with cable installation leading to impacts on the integrity of the local land drainage systems and potential flooding.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Secondary Co157 Co170 Co183 Tertiary Co10 Co13 Co14 Co19 Co186	**No likely significant effects (Magnitude - Negligible, Sensitivity - Low-High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.14.4) A construction phase drainage strategy will be prepared to support the DCO application, setting out the performance requirements of a temporary site drainage system to ensure there are no changes to surface runoff during the construction of the substation and cable route (Co14). The Outline Onshore Infrastructure Drainage Strategy (Co19) can be found in Volume F2, Chapter 6). All ditches and drainage outfalls will be retained where possible, and where it is not possible to retain them they will be repaired and reinstated (Co157). The construction drainage strategy will be agreed in advance with the Lead Local Flood Authority (LLFA) and the EA (Co14). The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (Volume A3, Chapter 2: Hydrology and Flood Risk).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of commitments Co10, Co13, Co14, Co19, Co157, Co170, Co183 and Co186, the disruption of land drainage during construction was scoped out of the PEIR assessment because no likely significant effects were identified at the scoping stage. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.8), and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-C-6	Onshore ECC	Construction	**Changes in water quality: Construction phase** Works associated with cable installation leading to impacts on the water quality of watercourses and drainage systems local to the works.	N/A as impact scoped out.	N/A as impact scoped out.	Tertiary Co4 Co6 Co8 Co10 Co14 Co19 Co64 Co77 Co124	**No likely significant effects (Magnitude - Negligible, Sensitivity - Low-High)**	**Scoped Out**	Agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.14.5). A construction phase drainage strategy will be prepared to support the DCO application, setting out the performance requirements of a temporary site drainage system to ensure there are no changes to surface runoff during the construction of the substation and cable route (Co14). The Outline Onshore Infrastructure Drainage Strategy (Co19) can be found in Volume F2, Chapter 6). A Construction Method Statement (CMS) will be developed as part of the Code of Construction Practice, secured through the Outline Code of Construction Practice (CoCP) (Co124) (Volume F2, Chapter 2). The CMS will adhere to construction industry good practice guidance (e.g. the Environment Agency's Guidance for Pollution Prevention notes, including GPP01, GPP05, GPP21 and GPP22 (which remain best practice despite no longer being statutory guidance) and CIRIA's 'Control of water pollution from construction sites: Guidance for consultants and contractors'), to include specific measures to prevent contamination of water receptors during construction (Co4). Guidance on pollution prevention will also be adhered to (Co6). This will involve measures to ensure there is no increase in the supply of fine sediment and other contaminants (e.g. from construction materials and machinery). The CoCP (based on the outline version in Volume F2, Chapter 2) will involve measures to ensure there is no increase in the supply of fine sediment and other contaminants (e.g. from construction materials and machinery).	N/A	N/A	**No Significant Effect**	**Scoped Out**	As a result of the commitments embedded within the scheme design (Co4, Co6, Co8, Co10, Co14, Co19, Co64, Co77 and Co124), the potential for changes in water quality during construction was scoped out of the PEIR because no likely significant effects were identified at the scoping stage. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.1) and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
HFR-O-7	Onshore Substation	Operation	**Alteration in run-off characteristics at substation site:Operation phase** The operational presence of the substation may alter surface run-off characteristics from the site and could lead to increased flood risk elsewhere.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Secondary Co68 Co184 Co185 Co191 Tertiary Co19 Co186 Co197	**Likely significant effects without mitigation**	**Not considered further in the EIA, further justification provided in column L**	This potential impact has been not considered in detail because an operational drainage strategy will be prepared as a certified document to support the DCO application (Co19). This sets out the performance requirements of the site drainage system that are necessary to ensure that there are no changes to the surface runoff resulting from the substation development. The performance requirements will be agreed with the LLFA and the EA, and the operational drainage strategy will be secured through **Volume F2, Chapter 6: Outline Onshore Infrastructure Drainage Strategy** (Co19). Once implemented, the operational drainage strategy will maintain greenfield run-off rates.The magnitude would therefore be Negligible. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 2: Hydrology and Flood Risk**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of the commitments embedded within the scheme design (Co19, Co68, Co184, Co185, Co186, Co191 and Co197), the alteration of surface run-off characteristics at the substation site during operation was scoped out of the PEIR assessment. Although likely significant effects were identified at the scoping stage, these would be managed with the proposed mitigation.This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.12), and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-C-8	Onshore ECC and Onshore Substation	Construction	**Mobilisation of pollutants in the event of disturbance of contaminated soils: Construction phase** Works associated with construction of the cable and substation may mobilise contaminants into surface water runoff from the site.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary Co4 Co6 Co77 Co124	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.1.4.6). Impacts relating to disturbance of contaminated ground (the location of which is identified as part of a Phase 1 Preliminary Risk Assessment (PRA) in **Volume A6, Annex 1.1: Land Quality Preliminary Risk Assessment**). Impact pathways will then be evaluated on the basis of proximity to proposed ground disturbance (Co77); and specific measures will be included in the CMS (part of the CoCP (Co124)) to prevent the ingress of soils and sediment whether contaminated or uncontaminated. Guidance on pollution prevention will also be adhered to (Co6) and Pollution Prevent Plan will also be developed, to include adherence to good practice guidance (Co4). The outline CoCP (**Volume F2, Chapter 2**) also includes measures to: Implement measures to protect groundwater during construction, including good environmental practices based on legal responsibilities and guidance on good environmental management in: guidance in: CIRIA C532 Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (Masters-Williams, 2001); and CIRIA C648 Control of Water Pollution from Linear Construction Projects (Murnane, Heap, and Swain, 2006) will be followed; • Avoidance of oil storage within 50 m of a spring, well or borehole; • Where oil could run over hard ground into a watercourse; • Secondary containment system that can hold at least 110% of the oil volume stored. In accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001. Refueling of machinery would be undertaken within designated areas where spillages can be easily contained. • Machinery would be routinely checked to ensure it is in good working condition; and any tanks and associated pipe work containing oils and fuels would be double skinned and be provided with intermediate leak detection equipment. Measures will be employed to intercept and treat run-off from the working width. After treatment, discharge of any waters will be carried out so as to minimise physical impacts on channel morphology. Discharges will not be made without prior agreement and appropriate consents and approvals from the Environment Agency and relevant IDB. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 2: Hydrology and Flood Risk**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of commitments Co4, Co6 and Co124, the mobilisation of pollutants through the disturbance of contaminated soils during construction was scoped out of the PEIR because no likely significant effects were identified at the scoping stage. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.10), and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-D-9	Onshore ECC	Decommissioning	**Impacts associated with decommissioning of the cable route: Decommissioning phase** Decommissioning activities along the cable route could disturb watercourses and affect water quality.	N/A as impact scoped out.	N/A as impact scoped out.	Tertiary Co127	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - High)**	**Scoped Out**	Agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.14.7). Decommissioning of the onshore ECC for Hornsea Four will comprise: • Buried export cables left in situ, with cable ends cut, sealed and securely buried. Partial removal of cables at landfall occur for aluminium/steel recycling; and • Joint Bays and Link boxes will typically be left in situ, or removed if environmentally feasible. All project mitigation and commitments apply for decommissioning and a decommissioning plan will be developed in line with the latest relevant available guidance (Co127). Further details will be provided and secured within a Decommissioning Plan, that will be submitted and agreed with stakeholders prior to the commencement of any decommissioning activities. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four.	N/A	N/A	**No Significant Effect**	**Scoped Out**	As a result of Co127, impacts associated with decommissioning the cable route were scoped out of the PEIR assessment because no likely significant effects were identified at the scoping stage. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.15) and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
HFR-D-10	Onshore Substation	Decommissioning	**Impacts associated with the decommissioning of the Hornsea Four substation: Decommissioning phase** Works associated with decommissioning of substation.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary Co127	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.1.4.8). Potential impacts resulting from decommissioning of the OnSS are considered to be equal to, or less than construction-stage impacts. All above ground infrastructure will be removed and the land reinstated (see **Volume A1, Chapter 4: Project Description** for further details). Decommissioning of the onshore ECC for Hornsea Four will comprise: • The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. Any waste arising from the decommissioning will be disposed of in accordance with the relevant regulations. The site will be returned to its previous condition. All project mitigation and commitments apply for decommissioning and a decommissioning plan will be developed in line with the latest relevant available guidance (Co127). Decommissioning practices will incorporate measures to prevent pollution, to include emergency spill response procedures, and clean up and remediation of contaminated soils. The measures will follow a similar approach to those set out for the construction phase. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 2: Hydrology and Flood Risk**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of commitments Co127, impacts associated with decommissioning the Hornsea Four OnSS were scoped out of the PEIR assessment because no likely significant effects were identified at the scoping stage.This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.16) and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-O-11	All - Onshore	Operation	**Impacts associated with operation: Operation phase** Operational activities at the substation site and along the cable route could disturb watercourses and affect water quality.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Secondary Co191 Tertiary Co19	**No likely significant effects** **(Magnitude and Sensitivity not defined at Scoping)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.1.4.9). Potential impacts on water quality during operation are not considered in detail in the assessment because there will be minimal requirements for routine maintenance along the cable corridor or at the onshore substation. Further information on the nature of any proposed operation and maintenance activities is provided in **Volume A1, Chapter 4: Project Description** to demonstrate that there will be no impacts on water quality. Necessary measures will be undertaken to ensure that there are no changes to surface runoff and adherence to SuDs hierarchies. This is secured through **Volume F2, Chapter 6: Outline Onshore Infrastructure Drainage Strategy** (Co19). The magnitude is considered to be Negligible due to the content set out above. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 2: Hydrology and Flood Risk**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of commitments Co19 and Co191, impacts associated with operation of the Hornsea Four OnSS, landfall and onshore ECC were scoped out of the PEIR assessment because no likely significant effects were identified at the scoping stage.This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.1.4), and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-C-12	Onshore ECC	Construction	**Hydrological and water quality effects on designated sites: Construction phase** Ground disturbance during construction could increase the supply of sediment and contaminants to the River Hull SSSI and change its hydrology	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Primary Co1 Secondary Co18 Tertiary Co4 Co8 Co10 Co14 Co19 Co64 Co77 Co124	**Impact not identified at Scoping**	**Not considered further in the EIA, further justification provided in column L**	Impact not identified at EIA Scoping but introduced at PEIR due to PINS scoping opinion (PINS Scoping Opinion, November 2018, ID:4.14.11). Trenchless crossing techniques will be adopted to allow the cable to cross all major watercourses along the onshore ECC, including the River Hull Headwaters SSSI. The entry and exit points will be located a suitable distance away from the river channel (at least 9 m; Co18) and the cabling will be installed a suitable distance beneath the watercourses (at least 1.2 m; Co18) to minimise the likelihood of interaction. Suitable clearance distances from SSSI watercourses will be informed by a site-specific hydrogeological risk assessment (Co18) and agreed with Natural England and the Environment Agency in advance of construction. There will therefore be no mechanisms for the disturbance of the SSSI watercourses during construction. Furthermore, the stability of the watercourses means that rates of lateral or vertical adjustment are unlikely to be sufficient to result in direct interactions with buried cable infrastructure in the future. Because trenchless cable crossings will not themselves directly interact with surface watercourses, they are proposed to be scoped out. Further information regarding crossing techniques is provided in the Crossings Schedule (**Volume A4, Annex 4.2**) and Commitments Register (**Volume A4, Annex 5.2**). It is also proposed that, due to the measures set out in the CoCP (Co124, a certified document within the DCO) and associated commitments (Co4, Co8, Co10, Co14, Co19, Co64 and Co77) to control the supply of fine sediment and other contaminants into surface watercourses and groundwaters, potential impacts on water quality in designated sites will also be scoped out. The outline CoCP was provided to support the PEIR. The magnitude is considered to be Negligible due to the content set out above. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 2: Hydrology and Flood Risk**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of commitments Co1, Co4, Co8, Co10. Co14, Co18, Co19, Co64, Co77 and Co124, impacts on the hydrology and water quality of designated sites during construction were scoped out of the PEIR assessment because no likely significant effects were identified at the scoping stage. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.2) and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**
HFR-O-13	Onshore ECC	Operation	**Thermal impacts on water resources: operational phase** Thermal effects of the underground power cables along the cable corridor during operation could lead to potential impacts on groundwater quality and associated species / habitats. For example, a reduction in WFD status.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Secondary Co18 Tertiary Co13	**Impact not identified at Scoping**	**Not considered further in the EIA, further justification provided in column L**	Impact not identified at EIA Scoping but introduced at PEIR following consultation with the Environment Agency during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 15th January 2019 (ON-HYD-2.1). Potential impacts on water temperature during operation are scoped out of the assessment because the cables will be buried at least 1.2 m beneath watercourses, and effects on the temperature of flowing water is therefore considered to be negligible. The optimal clearance depth beneath watercourses will be agreed with the relevant authorities prior to construction. Further details are provided in Co13 and Co18 in **Volume A4, Annex 5.2: Commitments Register**. Note that potential effects on aquatic biota resulting from changes to water temperature are considered in **Volume A6, Chapter 3: Ecology and Nature Conservation**. The magnitude is considered to be Negligible due to the content set out above. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 2: Hydrology and Flood Risk**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As a result of commitments Co18 and Co13 (including thermal insulation of the cables), thermal impacts on water resources during operation were scoped out of the PEIR assessment because no likely significant effects were identified at the scoping stage. This was agreed with the EA and Beverley and North Holderness IDB during the Hornsea Four Water and Flood Risk Evidence Plan Technical Panel Meeting on 5th November 2019 (ON-HYD-3.1.3), and with the LLFA, EA and Beverley and North Holderness IDB via the consultation process and therefore this impact has not been considered further in the ES.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
ENC-C-1	All - Onshore	Construction	**Direct impacts on designated sites: Construction phase** Temporary construction areas could occupy areas leading to loss and/or degradation of designated sites.	**Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1 m, Average Depth: 0.4 m • Joint Bays: Number: 240, Depth 2.5m, Area: 225 m2 per Joint Bay, Joint Bay compounds: 240 40x40 m compounds • Link Boxes: Number: 240, Depth: 2 m, Area: 9 m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5 m • Approximate Length: 1 km • Width: 60 m	These parameters represent maximum ground disturbance conditions, in areas where designated sites are crossed by specific onshore elements of Hornsea Four, both in terms of potential size of area affected and in terms of duration of expected disturbance.	Primary Co1 Co2 Co7 Co41 Secondary Co18 Co122 Co170 Co172 Co175 Tertiary Co4 Co33 Co114 Co124 Co168	**No likely significant effects** **(Magnitude - None, Sensitivity - Low-High)**	**Simple Assessment**	Scoped into assessment at PEIR based on PINS scoping opinion (PINS Scoping Opinion, November 2018, ID:4.15.1).	Minor	Medium	**No Significant Effect (Minor Adverse)**	**Simple Assessment**	The impact on designated sites is assessed in **Volume A3, Chapter 3: Ecology and Nature Conservation** and has been assessed in the ES due to potential impacts on designated sites from air quality factors.	Negligible	High	**No Significant Effect (Minor Adverse)**
ENC-C-2	All - Onshore	Construction	**Impacts on non-designated sites: Construction phase** Construction compounds, access roads and other infrastructure will temporarily occupy areas leading to loss and/or degradation of non-designated habitat.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth: 6 m **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1 m, Average Depth: 0.4 m • Joint Bays: Number: 240, Depth 2.5 m, Area: 225 m2 per Joint Bay, Joint Bay compounds: 240 40x40 m compounds • Link Boxes: Number: 240, Depth: 2 m, Area: 9 m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage)	These parameters represent maximum ground disturbance conditions both, in terms of potential size of area affected and in terms of duration of expected disturbance.	Primary Co1 Co2 Co7 Co26 Secondary Co18 Co68 Co122 Tertiary Co4 Co33 Co114 Co124 Co168	**Likely significant effect without mitigation**	**Simple Assessment**	N/A as impact scoped in	Negligible	Low	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in ES **Volume A3, Chapter 3: Ecology and Nature Conservation, Section 3.7**, changes to the redline boundary since PEIR have not had a material impact on the assessment. Management measures for onshore Ecology are set out in **Volume F2.3 Outline Ecological Management Plan, Volume F2.2 Outline Code of Construction Practice,** and **Volume F2.8 Outline Landscape Management Plan.** This impact is not considered in detail in the ES chapter, as agreed through consultation with NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 13 November 2019 (ON-ECO-3.8), as detailed in **Volume A3, Chapter 3: Ecology and Nature Conservation, Section 3.4.** The residual effects as set out in the PEIR remain not significant in EIA terms.	N/A	N/A	**No Significant Effect**
ENC-C-3	All - Onshore	Construction	**Impacts on bat species: Construction phase** Construction activities will temporarily occupy areas leading to loss and/or degradation of habitat and loss of habitat connectivity used by bats for roosting, commuting and/or foraging.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth: 6 m **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) • Permanent access road: Number 1, Length: 1,800 m Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	These parameters represent the maximum numbers of crossing, construction duration and building design parameters that could potentially disrupt bat commuting/foraging habitat and/or bat roosts. For further detail, see **Volume A4, Annex 4.2: Onshore Crossing Schedule**.	Primary Co2 Co7 Co26 Co27 Co36 Secondary Co30 Co68 Co69 Co122 Tertiary Co4 Co114 Co123 Co124 Co168	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	N/A	N/A	**N/A, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019.	**Detailed Assessment**	Baseline now acquired, therefore this impact is assessed and presented in ES **Volume A3, Chapter 3: Ecology and Nature Conservation**.	Medium	High	**No Significant Effect (Minor Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
ENC-C-4	All - Onshore	Construction	**Impacts on breeding and / or wintering bird species: Construction phase** Construction activities will temporarily occupy areas leading to loss and / or degradation of habitat and loss of habitat connectivity used by breeding and / or wintering birds.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth: 6 m **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) • Permanent access road: Number 1, Length: 1,800 m Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	These parameters represent maximum ground disturbance conditions both in terms of potential size of area affected and in terms of duration of expected disturbance.	Primary Co2 Co7 Co26 Co27 Secondary Co68 Co122 Tertiary Co4 Co33 Co114 Co124 Co168	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	High (overwintering birds only)	Medium (overwintering birds only)	**No LSE (Slight Adverse) (overwintering birds only)** **Breeding birds, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019.	**Detailed Assessment**	Baseline now acquired, therefore this impact is assessed and presented in ES Volume A3, Chapter 3: Ecology and Nature Conservation.	Low	High	**No Significant Effect (Minor Adverse)**
ENC-C-5	All - Onshore	Construction	**Impacts on otter and / or water vole: Construction phase** Open cut trenching and HDD used to cross watercourses with otter and / or water vole potential could lead to loss of habitat, disturbance and / or connectivity severance.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth: 6 m **Onshore Export Cable Corridor:** • Construction duration: 30 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Temporary watercourse crossings: Number: 31, Width: 6 m, Length: 10m • Crossings: Number: 58 **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) • Permanent access road: Number 1, Length: 1,800 m Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5 m • Approximate Length: 1 km • Width: 60 m	These parameters represent the maximum numbers of crossings that could potentially affect water vole and/or otter habitat.	Primary Co1 Co7 Co41 Secondary Co18 Co69 Co122 Co157 Co170 Co172 Tertiary Co4 Co114 Co123 Co124 Co168	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	N/A	N/A	**N/A, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019.	**Detailed Assessment**	Baseline now acquired, therefore this impact is assessed and presented in ES Volume A3, Chapter 3: Ecology and Nature Conservation.	Negligible	High	**No Significant Effect (Minor Adverse)**
ECN-C-6	All - Onshore	Construction	**Impacts on great crested newt populations: Construction phase** Works in or within 250 m of water bodies with great crested newt potential could cause habitat loss, degradation, habitat severance and harm or kill individual animals.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth: 6 m **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) • Permanent access road: Number 1, Length: 1,800 m Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	These parameters represent maximum ground disturbance conditions both in terms of potential size of area affected and in terms of duration of expected disturbance.	Primary Co2 Co7 Co26 Co36 Co78 Secondary Co119 Co122 Tertiary Co114 Co124 Co168	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	N/A	N/A	**N/A, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019.	**Detailed Assessment**	Baseline now acquired, therefore this impact is assessed and presented in ES Volume A3, Chapter 3: Ecology and Nature Conservation.	Negligible	Medium	**No Significant Effect (Minor Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
ENC-C-7	All - Onshore	Construction	**Impacts on white-clawed crayfish and fish: Construction phase** Open cut trenching, used to cross watercourses could lead to loss of habitat, disturbance and / or connectivity severance on white-clawed crayfish and fish.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Primary Co1 Co7 Secondary Co122 Tertiary Co124	**No likely significant effect** **(Magnitude - Small-Large, Sensitivity - Low-High)**	**Not considered further in the EIA, further justification provided in column L**	PINS agreed that effects on white clawed crayfish can be scoped out of the EIA (PINS Scoping Opinion, November 2018, ID:4.1.5.2). Stakeholders agreed to scope out at the third Onshore Ecology Technical Panel Evidence Plan Meeting held on the 8th April 2019. There is no evidence of white-clawed crayfish within the Hornsea Four data search study area (see **Volume A6, Annex 3.1: Extended Phase 1 Habitat Survey Report**). All EA classified main rivers and IDB maintained drains will be crossed by HDD or other trenchless technology (Co1), mitigating any impacts on fish species that may be present. In addition, within smaller watercourses that are subject to open cut crossing methods, the following mitigations are proposed: • In channel activities that prevent upstream migration will be limited to the duration of open-cut trenching works; and • Any temporary culverts required will be constructed to ensure there is no barrier to upstream fish passage (Co124, **Volume F2, Chapter 2: Outline Code of Construction Practice**). There is no evidence of fish within the Hornsea Four data search study area (see **Volume A6, Annex 3.1: Extended Phase 1 Habitat Survey Report**). To mitigate and avoid any adverse impacts to fish species, the following measures will be adhered to as set out in **Volume F2, Chapter 2: Outline Code of Construction Practice** and in HFR-C-6 on the Hydrology and Flood Risk tab: • Implement measures to protect groundwater during construction, including good environmental practices based on legal responsibilities and guidance on good environmental management in: guidance in: CIRIA C532 Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (Masters-Williams, 2001); and CIRIA C648 Control of Water Pollution from Linear Construction Projects (Murnane, Heap, and Swain, 2006) will be followed; • No discharge to surface watercourses will occur without permission from the Environment Agency; • Wheel washers and dust suppression measures to be used as appropriate, where necessary, to prevent the migration of pollutants; • Regular cleaning of access roads of any construction waste and dirt to be carried out; • A construction method statement will be submitted for approval by the responsible authority; • Deep trenchless excavations and deep excavations for pile foundations to be mitigated by casing off perched [illegible] • Inert bentonite or natural clay seals may be used as a drilling fluid and to seal deep excavations where there is a risk that groundwater could be compromised, thereby reducing or eliminating the pathway whereby new contaminants can enter groundwater as a result of subsurface activities. The magnitude is considered to be Negligible based on the above content. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 3: Ecology and Nature Conservation**).	N/A	N/A	**No LSE**	**Not considered further in the EIA, further justification provided in column R**	Management measures for onshore Ecology are set out in **Volume F2.3 Outline Ecological Management Plan**, and **Volume F2.2 Outline Code of Construction Practice**. This impact is not considered in detail in the ES chapter, as agreed through consultation with ERYC, NE, YWT and the EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019 (ON-ECO-3.2 and ON-ECO-3.5). Further consultation was undertaken regarding this impact not being considered in detail in this ES chapter and was agreed with Natural England on 13th November 2019. The conclusion of No LSE as set out in the Scoping Report remain not significant in EIA terms. There is no evidence of white-clawed crayfish within the data search study area. All EA classified main rivers and IDB maintained drains will be crossed by HDD (Co1), mitigating any impacts on fish species that may be present. In addition, within smaller watercourses that are subject to open cut crossing methods, the following mitigations are proposed: In channel activities that prevent upstream migration will be limited to the duration of open-cut trenching works; and Any temporary culverts required will be constructed to ensure there is no barrier to upstream fish passage (Co124, **Volume F2, Chapter 2: Outline Code of Construction Practice**). To mitigate and avoid any adverse impacts to fish species, the following measures will be adhered to (further information is provided within **Volume A3, Chapter 2: Hydrology and Flood Risk**): In-channel activities that prevent upstream migration (e.g. river and sea lamprey) will be limited to the duration of open-cut trenching works in any particular location; and Any temporary culverts will be constructed to ensure they do not create a barrier to upstream fish passage. This will be undertaken following the best guidance practice set out in CIRIA C689 (CIRIA, 2010) Culvert design and operation guide, culverts will be adequately sized to avoid impounding flows. Furthermore, the culvert bed will be installed below the active bed of the watercourse to ensure that sediment continuity and the movement of aquatic organisms can be maintained, and the likelihood of upstream sedimentation and downstream scour is minimised (Co124, **Volume F2, Chapter 2: Outline Code of Construction Practice**). Further information can be found within, **Volume A3, Chapter 2: Hydrology and Flood Risk**. Furthermore, stakeholders agreed for this impact to not be considered in the ES Chapter at the Ecology Technical Panel Evidence Plan Meeting held on the 13th November 2019 (ON-ECO-3.9).	N/A	N/A	**No Significant Effect**
ENC-C-8	All - Onshore	Construction	**Impacts on reptiles: Construction phase** Construction activities will temporarily occupy areas leading to loss and / or degradation of habitat, loss of habitat connectivity and harm or mortality of individual reptiles.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth: 6 m **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Joint Bays: Number: 240, Depth: 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) • Permanent access road: Number 1, Length: 1,800 m Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	These parameters represent maximum ground disturbance conditions both in terms of potential size of area affected and in terms of duration of expected disturbance.	Primary Co2 Co7 Co26 Secondary Co120 Co122 Tertiary Co65 Co114 Co124 Co168	**Likely significant without secondary mitigation.**	**Simple Assessment**	N/A as impact scoped in	Moderate	Low	**No LSE (Slight Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	Management measures for onshore Ecology are set out in **Volume F2.3 Outline Ecological Management Plan**, and **Volume F2.2 Outline Code of Construction Practice**. This impact is not considered in detail in the ES chapter, as agreed through consultation with NE, YWT, RSPB and the EA at Ecology Technical Panel Meeting held on the 13th November 2019 (ON-ECO-3.10). The conclusion of No LSE as set out in the Scoping Report remains not significant in EIA terms. Further information on baseline environment is presented in **Volume A3, Chapter 3: Ecology and Nature Conservation,** Section 3.7 and the mitigations that Hornsea Four have committed to is presented in **Volume A3, Chapter 3: Ecology and Nature Conservation** Table 3.14.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
ENC-C-9	All - Onshore	Construction	**Impacts on badgers: Construction phase** Construction activities could disturb badger setts and / or lead to temporary severance of territories.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth: 6 m **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) • Permanent access road: Number 1, Length: 1,800 m Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	These parameters represent maximum ground disturbance conditions both in terms of potential size of area affected and in terms of duration of expected disturbance.	Primary Co2 Co7 Co26 Co35 Co36 Co41 Secondary Co68 Co69 Co122 Tertiary Co114 Co123 Co124 Co168	**Likely significant without mitigation.**	**Detailed Assessment**	N/A as impact scoped in	N/A	N/A	**N/A, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019.	**Detailed Assessment**	Baseline now acquired, therefore this impact is assessed and presented in ES Volume A3, Chapter 3: Ecology and Nature Conservation.	Medium	Low	**No Significant Effect (Minor Adverse)**
ENC-C-10	All - Onshore	Construction	**Impacts on habitats or species: Construction phase** Construction could cause damage to habitats or species from accidental release of pollutants	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Primary Co1 Co2 Tertiary: Co4 Co6 Co124 Co168 Secondary Co122	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Low-High)**	**Not considered further in the EIA, further justification provided in column L**	PINS agreed that impacts from airbourn contaminants can be scoped out of the EIA (PINS Scoping Opinion, November 2018, ID:4.15.3). All construction activities will be undertaken in adherence to the project Outline CoCP (Co124), and Outline EMP (Co168) to ensure no adverse effect on habitats or species from the accidental release of pollutants. Further information on baseline environment is presented in ES Volume A3, Chapter 3: Ecology and Nature Conservation. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (Volume A3, Chapter 3: Ecology and Nature Conservation).	N/A	N/A	**No LSE**	**Not considered further in the EIA, further justification provided in column R**	Management measures for onshore Ecology are set out in Volume F2.3 Outline Ecological Management Plan, and Volume F2.2 Outline Code of Construction Practice. This impact is not considered in detail in the ES chapter, as agreed through consultation with NE, YWT, RSPB and the EA at Ecology Technical Panel Meeting held on the 13th November 2019 (ON-ECO-3.11). The conclusion of No LSE as set out in the Scoping Report remains not significant in EIA terms. Further information on baseline environment is presented in Volume A3, Chapter 3: Ecology and Nature Conservation, Section 3.7 and the mitigations that Hornsea Four have committed to is presented in Volume A3, Chapter 3: Ecology and Nature Conservation, Table 3.14.	N/A	N/A	**No Significant Effect**
ENC-O-11	Onshore Substation	Operation	**Impacts on habitats or species: Operation phase** Operation of the OnSS will cause long-term habitat loss, degradation and potential displacement of protected species.	**Onshore Substation and Energy Balancing Infrastructure:** • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Permanent access road: Number 1, Length: 1, 800 m, Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). • Noise levels during operation (Power Convertors): 85 dB per unit • Power convertors: Number: 100	These parameters represent maximum land take and operational activities relevant to the OnSS.	Secondary Co30 Co122 Co159 Co193 Co195 Tertiary Co168	**Likely significant without mitigation.**	**Detailed Assessment**	N/A as impact scoped in	N/A	N/A	**N/A, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019.	**Detailed Assessment**	Baseline now acquired, therefore this impact is assessed and presented in ES Volume A3, Chapter 3: Ecology and Nature Conservation.	Low	Negligible	**No Significant Effect (Negligible)**
ENC-O-12	Onshore ECC	Operation	**Impacts on habitats: Operation phase** Excavating a section of cable for maintenance or repair could cause temporary habitat loss or degradation	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effects** **(Magnitude - Low, Sensitivity - Low-High)**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.15.4). As discussed and agreed in principle with Natural England at the Hornsea Four Ecology Evidence Plan Technical Panel Meeting on the 13th November 2019 (ON-ECO-3.12).	N/A	N/A	**No LSE**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.15.4). Management measures for onshore Ecology are set out in Volume F2.3 Outline Ecological Management Plan, and Volume F2.2 Outline Code of Construction Practice.	N/A	N/A	**No Significant Effect**
ENC-O-13	Onshore ECC	Operation	**Impacts on protected species: Operation phase** Operation and maintenance activities of the onshore cable route could cause disturbance to protected species	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effects** **(Magnitude - Low, Sensitivity - Low-High)**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.15.5). As discussed and agreed in principle with Natural England at the Hornsea Four Ecology Evidence Plan Technical Panel Meeting on the 13th November 2019 (ON-ECO-3.13).	N/A	N/A	**No LSE**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.15.5). Management measures for onshore Ecology are set out in Volume F2.3 Outline Ecological Management Plan, and Volume F2.2 Outline Code of Construction Practice.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
ENC-O-14	Onshore Substation	Operation	**Impacts on protected species: Operation phase** Operation and maintenance activities of the onshore substation could cause disturbance to protected species as a result of increases in noise and light	**Onshore Substation and Energy Balancing Infrastructure:** • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Permanent access road: Number 1, Length: 1,800 m, Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). • Noise levels during operation (Power Convertors): 85 dB per unit • Power convertors: Number: 100	These parameters represent maximum land take and operational activities relevant to the OnSS.	Tertiary Co168 Secondary Co122 Co159	**Likely significant without mitigation.**	**Detailed Assessment**	N/A as impact scoped in	N/A	N/A	**N/A, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation	**Detailed Assessment**	Baseline now acquired, therefore this impact is assessed and presented in ES **Volume A3, Chapter 3: Ecology and Nature Conservation**	Low	High	**No Significant Effect (Minor Adverse)**
ENC-O-15	All - Onshore	Operation	**Impacts on habitats or species: Operation phase** Operation and maintenance activities could cause damage to habitats or species from accidental release of pollutants	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Low-High)**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.15.6).	N/A	N/A	**No LSE**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.15.6). Management measures for onshore Ecology are set out in **Volume F2.3 Outline Ecological Management Plan**, and **Volume F2.2 Outline Code of Construction Practice**.	N/A	N/A	**No Significant Effect**
ENC-D-16	Onshore ECC	Decommissioning	**Impacts on habitats: Decommissioning phase** Decommissioning of onshore cable could cause temporary loss or degradation to habitat	N/A as impact scoped out.	N/A as impact scoped out.	Tertiary Co127	**No likely significant effects** **(Magnitude - Not Affected, Sensitivity - Low-High)**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.15.7). Decommissioning of the onshore ECC for Hornsea Four will comprise: • Buried export cables left in situ, with cable ends cut, sealed and securely buried. Partial removal of cables at landfall occur for aluminium/steel recycling; and • Joint Bays and Link boxes will typically be left in situ, or removed if environmentally feasible. All project mitigation and commitments apply for decommissioning and a decommissioning plan will be developed in line with the latest relevant available guidance (Co127). Further details will be provided and secured within a Decommissioning Plan, that will be submitted and agreed with stakeholders prior to the commencement of any decommissioning activities. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four.	N/A	N/A	**No LSE**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.15.7). Management measures for onshore Ecology are set out in **Volume F2.3 Outline Ecological Management Plan**, and **Volume F2.2 Outline Code of Construction Practice**. The Hornsea Four decommissioning approach is outlined within **Volume A1, Chapter 4, Project Description**.	N/A	N/A	**No Significant Effect**
ENC-D-17	Onshore Substation	Decommissioning	**Impacts on habitats: Decommissioning phase** Decommissioning of the onshore substation could lead to temporary habitat loss or degradation	**Decommissioning of the OnSS for Hornsea Four will comprise the following activities:** • The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. The site will be returned to its previous condition (see Section 4.13.2, **Volume A1, Chapter 4: Project Description**). Further details will be provided and secured within a Decommissioning Plan (Co127), agreed with stakeholders prior to decommissioning commencing. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst.	The parameters selected set out the worst case spatial and temporal envelope for ground disturbance during decommissioning of the OnSS.	Tertiary Co127	**Likely significant without mitigation.**	**Simple Assessment**	N/A as impact scoped in	N/A	N/A	**N/A, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019.	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	Management measures for onshore Ecology are set out in **F2.3 Outline Ecological Management Plan**, and **F2.2 Outline Code of Construction Practice**. The Hornsea Four decommissioning approach is outlined within ES **Volume A1, Chapter 4, Project Description**. This impact is not considered in detail in the ES chapter, as agreed through consultation with NE, YWT, RSPB and the EA at Ecology Technical Panel Meeting held on the 13th November 2019 (ON-ECO-3.16). The conclusion of No LSE as set out in the Scoping Report remains not significant in EIA terms.	N/A	N/A	**No Significant Effect**
ENC-D-18	Onshore Substation	Decommissioning	**Impacts on protected species: Decommissioning phase** Decommissioning of the onshore substation could lead to temporary disturbance or displacement of protected species	**Decommissioning of the onshore infrastructure for Hornsea Four will comprise the following activities:** • The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. The site will be returned to its previous condition (see Section 4.13.2, **Volume A1, Chapter 4: Project Description**). Further details will be provided and secured within a Decommissioning Plan, agreed with stakeholders prior to decommissioning commencing. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst.	The parameters selected set out the worst case spatial and temporal envelope for ground disturbance during decommissioning of the OnSS.	Tertiary Co127	**Likely significant without mitigation.**	**Simple Assessment**	N/A as impact scoped in	N/A	N/A	**N/A, impact assessment not completed at PEIR due to incomplete baseline data.** This approach was agreed through consultation with ERYC, RSPB, NE, YWT and EA at the Ecology and Nature Conservation Technical Panel Meeting on 8th April 2019.	**Simple Assessment**	Baseline now acquired, therefore this impact is assessed and presented in ES **Volume A3, Chapter 3: Ecology and Nature Conservation**.	Medium	High	**No Significant Effect (Minor Adverse)**
ENC-D-19	Onshore Substation	Decommissioning	**Impacts on habitats or species: Decommissioning phase** Decommissioning of the onshore substation could lead to damage to habitats or species from accidental release of pollutants	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary Co127	**No likely significant effects** **(Magnitude - Low, Sensitivity - Low-High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.15.8). Decommissioning of the onshore infrastructure for Hornsea Four will comprise the following activities: • The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. The site will be returned to its previous condition. A decommissioning plan will be developed in line with the latest relevant available guidance (Co127). Further details will be provided and secured within a Decommissioning Plan, that will be submitted and agreed with stakeholders prior to the commencement of any decommissioning activities. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four. The magnitude is Negligible based on the content above. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 3: Ecology and Nature Conservation**).	N/A	N/A	**No LSE**	**Not considered further in the EIA, further justification provided in column R**	Management measures for onshore Ecology are set out in **Volume F2.3 Outline Ecological Management Plan**, and **Volume F2.2 Outline Code of Construction Practice**. This impact is not considered in detail in the ES chapter, as agreed through consultation with NE, YWT, RSPB and the EA at Ecology Technical Panel Meeting held on the 13th November 2019 (ON-ECO-3.16). The conclusion of No LSE as set out in the Scoping Report remains not significant in EIA terms.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
LV-C-1	Landfall and onshore ECC	Construction	**Temporary effects: Construction phase** Construction activity associated with the landfall and onshore ECC will temporarily occupy the landfall work area, the ECC working width, compounds and means of access, leading to loss of landscape features and a change to landscape character and to views. Temporary change to views in the landfall area and onshore ECC from construction activities.	**General:** • All trees and hedgerows within the onshore ECC and landfall Order Limits will be removed. • Installation of temporary fencing (post and wire or similar) along the entire ECC and landfall Order Limits. • PRoW closure: not be closed for any longer than three months at any one time, or for six months in total over the whole construction period. Where closures are required for longer period, ERYC will be informed in writing. **Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Beach closure: 0 months, unless an unforeseen and unplanned event occurs requiring emergency access. • All land within ECC Order Limits, and landward of the Transition Joint Bays, will be disturbed **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Reinstatement: hedgerow can be planted over cables (60 m easement) but not trees.	These parameters present the worst case assessment with regards to the maximum loss of trees and hedgerows and/or area of landscape features to be disturbed.	<u>Primary</u> Co1 Co2 Co7 Co25 Co26 Co27 Co28 Co49 Co79 Co134 Co135 <u>Tertiary</u> Co10 Co124 <u>Secondary</u> Co30 Co68 Co69 Co157 Co158 Co165 Co168 Co187 Co192	**Likely significant effects without mitigation**	**Simple Assessment**	N/A as impact scoped in	Small	Medium	**No Significant Effect identified for any landscape receptors.** **No LSE identified for visual receptors along the onshore ECC.** **Moderate Adverse effects identified for visual receptors at the landfall, arising from effects of open trenching across the beach and associated beach closure.**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	Assessed as part of the EIA, as set out in the PEIR (Orsted, 2019b), and no likely significant effect identified except in one specific 'worst case' relating to open cut at landfall. The offshore export cables will now be brought ashore at the landfall using HDD (or other trenchless technologies) (Co187) and no beach closure will take place (Co192). Therefore, no likely significant effect and no need to consider in detail in the ES. The draft assessment was shared with ERYC to agree on this matter.	N/A	N/A	**No Significant Effect**
LV-O-2	Landfall & onshore ECC	Operation	**Permanent/long-term effects resulting from construction activities: Operational phase** Permanent impact of the landfall and onshore ECC may affect designated and non- designated landscape receptors (including landscape features such as woodlands and hedgerows).	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	<u>Primary:</u> Co2 Co25 Co27 Co28 <u>Tertiary</u> Co10 Co124 Co168 <u>Secondary</u> Co30 Co157 Co168 Co187 <u>Enhancement</u> Co194	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Negligible-Low)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.16.2). To address this, further detail is provided below on "what mitigation has been incorporated into the assessment and how it is to be secured" (identified as required by PINS Scoping Opinion, November 2018, ID 4.16.2). **Landfall:** The refined landfall location does not intersect with any sensitive landscape or visual features. The cabling at the landfall will be installed using trenchless techniques (Co187). Above ground disturbance will be seen in the landscape and in views during construction, and only for a short period of time after the work has been completed. However, upon completion the site will be cleared and reinstated (Co10), typically this would be to arable land. As a result, there will be no permanent loss of any valued landscape features. Once operational, the cables at the landfall will be buried underground. As such, significant effects are not anticipated to arise during the operational phase. **Onshore ECC:** The proposed onshore ECC has been routed so that it avoids sensitive landscape and visual features including woodlands, wetlands, natural or semi-natural vegetation as far as possible (Co2). Where it is necessary to remove short sections of hedgerow and occasional trees in order to install the cables along the onshore ECC, these will be reinstated and/or replaced where possible (Co26). Micrositing to avoid isolated mature trees will be undertaken where it is feasible (Co27). Where possible and with landowner agreement, hedgerows will be replaced with locally native and more diverse species (Co194). The Outline Landscape Management Plan (Volume F2, Chapter 8) sets out principles of planting, monitoring and management that will ensure replacement planting is effective (Co30). Additionally, field boundaries comprising fences, walls and ditches will be reinstated prior to the land being returned to the farmers (Co157). Once operational, all aspects associated with the proposed onshore ECC will be buried underground (Co25). As such, significant effects are not anticipated to arise during the operational phase. The mitigation will be secured through DCO Requirement 16 requiring the development of an CoCP (Volume F2, Chapter 2: Outline Code of Construction Practice) (Co124), DCO Requirement 7 which requires the development of a Landscape Management Plan (Co30), and DCO Requirement 9 prescribing the production of an Ecological Management Plan (Co168). The details are to be agreed prior to their discharge, before construction begins. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (Volume A3, Chapter 4: Landscape and Visual Assessment).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	The approach was set out in the Hornsea Project Four Landscape and Visual Impact Assessment Position Paper (Ortsed, 2019), which was agreed by Hull City Council, ERYC and Natural England in their email responses, and detailed in Table 4.4 of Volume A3, Chapter 4: Landscape and Visual (ON-HUM-1.14). Further justification was provided in the PEIR (see column L) and no adverse comment on the approach was received during the 2019 Section 42 Consultation process.	N/A	N/A	**No Significant Effect**
LV-O-3	Landfall & onshore ECC	Operation	**Permanent /long-term effects resulting from construction activities: Operational phase** Permanent impact of the landfall, and onshore ECC may affect visual receptors in settlements and at individual properties, along key routes (national trails and tourist routes), along other roads and public rights of way, and in accessible and recreational landscapes.	Not required as agreement achieved during EIA Scoping (ID.4.16.3).	N/A as impact scoped out.	<u>Primary:</u> Co2 Co25 Co26 Co27 Co28 <u>Tertiary</u> Co10 Co124 Co168 <u>Secondary</u> Co30 Co68 <u>Enhancement</u> Co194	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Low-High)**	**Scoped Out**	Post-construction, all landscape features will be restored or replaced, and no above-ground structures will be present. Agreed in Scoping Opinion (PINS Scoping Opinion, November 2018, ID.4.16.3).	N/A	N/A	**No Significant Effect**	**Scoped Out**	Agreement between Hornsea Four and Stakeholders at Scoping that impact can be "Scoped Out".	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
LV-C-4	Onshore Substation	Construction	**Temporary effects on landscape and viewers of the onshore substation site: Construction phase** Construction activity associated with the onshore substation will temporarily occupy the substation construction area and means of access, leading to loss of landscape features and a change to landscape character and to views. Changes to views may affect visual receptors in settlements and at individual properties, along key routes (national trails and tourist routes), along other roads and public rights of way, and in accessible and recreational landscapes.	**Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent area of site for all infrastructure: 164,000 m2 of which 34,000 m2 will comprise landscaping and 4,000 m2 will comprise attenuation feature(s). • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 15 m (7 m road, 8 m soil storage) • Temporary Fencing: To be erected around entirety of OnSS/EBI permanent and temporary works area, inclusive of access track. • All vegetation within these areas will be removed, except the areas of areas of Works Number 7d and 7f along the northern boundary of the OnSS (Sheet 28, Volume D1, Annex 4.2).	These parameters present the maximum parameters for potential loss and/ or disturbance to landscape features, resulting in visual intrusion.	Primary Co2 Co26 Co27 Co49 Co79 Co145 Co151 Co165 Tertiary Co10 Co124 Secondary: Co30 Co69 Co168	**Likely significant effects without mitigation**	**Simple Assessment**	N/A as impact scoped in	Medium (landscape) and large (views)	Medium (landscape) and high/medium (views, residential receptors/ recreational receptors)	**LSE (Major Adverse)**	**Simple Assessment**	As a result of changes to OnSS and EBI since PEIR, this impact is assessed and presented in ES Volume A3, Chapter 4: Landscape and Visual.	Medium (landscape) and large (views)	Medium (landscape) and high/ medium (visual receptors)	**Large adverse**
LV-O-5	Onshore Substation	Operation	**Permanent effects on landscape and viewers of the onshore substation site: Operational phase** Operation of the onshore substation will permanently occupy land which is currently characterised by agricultural use, with hedgerows and woodlands beyond, leading to loss of landscape features, and a change to landscape character and to views.	**Onshore Substation and Energy Balancing Infrastructure:** • Onshore Operational Life: 35 years • Permanent area (inclusive of landscaping and attenuation feature(s)): 164,000 m2 of which 34,000 m2 will comprise landscaping and 4,000 m2 will comprise attenuation feature(s), with the remaining 126,000 m2 used for the OnSS and EBI. • Permanent access road: Number 1; Length: 1, 800 m; Width: 10 m (7 m road, 3 m soil stabilisation and below ground utilities). **OnSS:** • Main Buildings: Number: 2, Length: 240 m (if single building), Width: 80 m (if single building), Height: 25 m • Secondary Buildings: Number: 15, Total Combined Area: 7,000 m2, Height: 15 m • Height of fire walls: 25 m • Height of lightning protection for main building: 30 m **EBI:** • Main and Secondary Buildings: Total Area (within permanent infrastructure area): 17,300 m2 • Main buildings: Height: 15 m • Secondary buildings: Height: 20 m (type one) • Height of fire walls: 25 m • Lightning protection: Height: 25 m • Minimum landscape treatment as per Section 4.2.6, Volume A1, Chapter 4: Project Description. The infrastructure has been placed in the most sensitive parts of the landscape to provide the maximum design scenario.	These parameters present the maximum parameters stated stated for the OnSS and EBI structures, which area considered likely to have greater effects and potentially less susceptible to mitigation.	Primary Co2 Co27 Co79 Co145 Co151 Secondary Co30 Co168 Co193 Co195 Enhancement Co196	**Likely significant effects without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Small to large (landscape) and negligible to large (views)	Medium (landscape) and high/ medium (visual receptors)	**Negligible to Moderate Adverse**	**Detailed Assessment**	As a result of changes to OnSS and EBI since PEIR, this impact is assessed and presented in ES Volume A3, Chapter 4: Landscape and Visual.	Small to large (landscape) and negligible to large (views)	Medium (landscape) and high/ medium (visual receptors)	**Negligible to Moderate adverse**
LV-D-6	All- onshore	Decommissioning	**Temporary effects on landscape and viewers: Decommissioning phase** Decommissioning of all works could affect the landscape and views.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary: Co127	**No likely significant effects** **(Magnitude - Medium-Large (short duration), Sensitivity - Low-High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.16.4), not considered in detail in the PEIR. The Onshore Decommissioning Plan (Co127) will include accord with the latest available relevant guidance and will be agreed with stakeholders prior to decommissioning commencing. Decommissioning of the onshore infrastructure for Hornsea Four will comprise the following activities: • Buried export cables left in situ, with cable ends cut, sealed and securely buried. Partial removal of cables at landfall occur for aluminium/steel recycling; • Joint Bays and Link boxes will typically be left in situ, or removed only if feasible; and • The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. The site will be returned to its previous condition. The effects on landscape and views arising from the decommissioning phase will be minimal and can be scoped out because of the measures described below. **Landfall and onshore ECC:** The onshore export cables will be left in place in the ground, therefore there will be no disturbance across the onshore ECC or landfall area, other than removal of jointing pits if required. **OnSS:** The temporary impacts on landscape and viewers of the OnSS: during the decommissioning phase are likely to be similar but not greater than to those which will occur during construction., but the works will be of shorter duration, as detailed in Volume A1, Chapter 4: Project Description.	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	The approach was set out in the Hornsea Four Landscape and Visual Impact Assessment Position Paper (April 2019), which was agreed by Hull City Council, ERYC and Natural England in their email responses, as detailed in Table 4.4 of Volume A3, Chapter 4: Landscape and Visual (ON-HUM-1.14). Further justification was provided in the PEIR (see Column L), and no adverse comment on the approach was received during the 2019 Section 42 Consultation process.	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
HE-C-1	All-Onshore	Construction	**Direct (physical) impacts on designated heritage assets: Construction Phase** Construction activities which may lead to the disturbance of or removal of assets.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Primary Co2	**No likely significant effects** **(Magnitude - None, Sensitivity - Medium-High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.17.1) All designated heritage assets have been avoided through the route planning and site selection process for landfall, the onshore ECC and OnSS. As such, no direct (physical) significant effects to designated heritage assets will occur. (see Co2 within the Volume A4, Annex 5.2: Commitments Register) Email correspondence with Mr Keith Emerick at Historic England on 17.06.2019 has confirmed the following: *"we can agree that direct physical impacts on designated assets can be scoped out if you can demonstrate that the designated sites have been avoided. But I am concerned about the use of the word 'direct' as it is often used when discussing 'setting' and implies a lesser form of impact, when – in fact – the impact within setting can be 'direct' on the significance of the place."* The magnitude is None (negligible using updated definitions) as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 5: Historic Environment**).	N/A	N/A	**No Significant Effect**	**Simple Assessment**	Following the route refinement process, the Onshore ECC incorporates a Scheduled Monument at York Road (near AP_022). For this reason, directs impacts on designated heritage assets during construction have been scoped back in at ES stage for assessment. This assessment is detailed in **Volume A3, Chapter 5: Historic Environment**. All other designated heritage assets will be avoided by the permanent project footprint as detailed in Commitment Co2. Further details on Co2 are provided in **Volume A4, Annex 5.2: Commitments Register**.	Negligible	High	**No Significant Effect (Minor Adverse)**
HE-C-2	All-Onshore	Construction	**Indirect (non-physical) impacts on designated heritage assets: Construction Phase** Construction activities which may lead a change in the setting of assets.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • HDD: Number: 8 • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit • HDD noise level: 120 dB • Simultaneous HDDs: Number: 3 **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Noise levels: Cable Installation: 108 dB, Construction of Joint Bays: 115 dB **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Height of viewing platform: 30 m • Noise levels: 108 dB **400kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m **Traffic Movements:** • Peak two-way daily HGV movements in one month: 874 • Peak two-way daily LCV movements: 368	These parameters present the maximum durations and disturbances which have the potential to indirectly impact upon designated heritage assets through an alteration to their setting.	Primary Co2 Co7 Co25 Co26 Co28 Co150 Co151 Tertiary Co124 Secondary Co30 Co69	**Likely significant effect without mitigation**	**Simple Assessment**	N/A as impact scoped in	Minor	Medium to High	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in **Volume A3, Chapter 5: Historic Environment**, changes to the Order Limits since PEIR have not had a material impact on the assessment. At PEIR, the setting assessment was incomplete; this has been updated to reflect the design changes and is presented in **Volume A6, Annex 5.1: Historic Environment Desk Based Assessment**. This approach was agreed vial email correspondence with Mr Keith Emerick at Historic England on 14th November 2019 (ON-HIS-5.4). In addition to this, following the change in the basis for assessment in the ES (i.e. the change to the updated DMRB assessment methodology) this impact is considered 'slight' (not significant) and is therefore not considered in detail in the ES. A new access will be taken directly from the A1079, to route construction traffic away from Cottingham (designated as a Conservation Area and comprising a number of Listed Buildings, a Scheduled Monument and Registered Park and Garden) as detailed in Commitment Co150.	N/A	N/A	**No Significant Effect**
HE-C-3	All-Onshore	Construction	**Direct (physical) impacts on non-designated heritage assets: Construction Phase** Construction activities which may lead to disturbance of or removal of assets.	**Landfall:** • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Transition Joint Bays (located within Landfall compound area): Number: 8, Depth: 6 m Trenchless techniques(deeply buried archaeology MDS): • HDD cable ducts: Number: 8, Diameter: 1m, Length: 1.5 km • HDD Entry Pits: Area: 125 m2 per entry pit, Depth: 6 m • HDD burial depth: Maximum: 40 m, Minimum: 5 m • HDD Exit Pits: Number: 8, Area: 900 m2 per exit pit, Depth: 5 m • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • Distance between Joint Bay/ Link Box: Minimum: 750 m, Maximum: 3,000 m • Joint Bays: Number: 240, Depth 2.5m, Area: 225m2 per Joint Bay, Joint Bay compounds: 240 40x40m compounds • Link Boxes: Number: 240, Depth: 2m, Area: 9m2 per Link Box • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	These parameters present the maximum below ground disturbances which could occur on buried archaeological and geoarchaeological remains at the landfall, onshore ECC, OnSS, Energy Balancing Infrastructure and 400 kV export cable including temporary compounds and access routes.	Primary Co2 Co7 Tertiary Co124 Secondary Co160	**Likely significant effects without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Moderate to Major	Low to High	**No Significant Effect to LSE (Minor to Major Adverse)**	**Detailed Assessment**	Additional baseline data acquired and reassessed as Detailed Assessment in **Volume A3, Chapter 5: Historic Environment**.	Moderate to Major	Low to High	**No Significant Effect to LSE (Minor to Major Adverse)**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
HE-C-4	All-Onshore	Construction	**Indirect (non-physical) impacts on non-designated heritage assets: Construction Phase** Construction activities which may lead a change in the setting of assets.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • HDD: Number: 8 • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit • HDD noise level: 120 dB • Simultaneous HDDs: Number: 3 **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Noise levels: Cable Installation: 108 dB, Construction of Joint Bays: 115 dB **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Height of viewing platform: 30 m • Noise levels: 108 dB **400kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m **Traffic Movements:** • Peak two-way daily HGV movements in one month: 874 • Peak two-way daily LCV movements: 368	These parameters present the maximum durations and disturbances which have the potential to indirectly impact upon non-designated heritage assets through an alteration to their setting.	Primary Co2 Co7 Co25 Co26 Co28 Co150 Tertiary Co30 Co124 Secondary Co69	**Likely significant effects without mitigation**	**Simple Assessment**	N/A as impact scoped in	Minor	Low to High	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in **Volume A3, Chapter 5: Historic Environment**, changes to the Order Limits since PEIR have not had a material impact on the assessment. At PEIR, the setting assessment was incomplete; this has been updated to reflect the design changes and is presented in **Volume A6, Annex 5.1: Historic Environment Desk Based Assessment**. This approach was agreed vial email correspondence with Mr Keith Emerick at Historic England on 14th November 2019 (ON-HIS-5.4). In addition to this, following the change in the basis for assessment in the ES (i.e. the change to the updated DMRB assessment methodology) this impact is considered 'slight' (not significant) and is therefore not considered in detail in the ES. A new access will be taken directly from the A1079, to route construction traffic away from Cottingham (designated as a Conservation Area and comprising a number of Listed Buildings, a Scheduled Monument and Registered Park and Garden) as detailed in Commitment Co150.	N/A	N/A	**No Significant Effect**
HE-O-5	Onshore Substation	Operation	**Indirect (non-physical) impacts on designated heritage assets: Operation Phase** As a result of the presence of infrastructure in the landscape with the potential to result in a change in setting of assets.	**Onshore Substation and Energy Balancing Infrastructure:** • Onshore Operational life: 35 years **OnSS:** • Permanent area (inclusive of landscaping and attenuation): 164,000 m2 • Main Buildings: Number: 2, Length: 240 m (if single building), Width: 80m (if single building), Height: 25 m • Secondary Buildings: Number: 15, Total Combined Area: 7,000m2, Height: 15 m • Height of fire walls: 25 m • Height of lightning protection for main building: 30 m **EBI:** • Main and Secondary Buildings: Total Area (within permanent infrastructure area): 17,300 m2 • Main buildings: Height: 15 m • Secondary buildings: Height: 20 m (type one) • Height of fire walls: 25 m • Lightning protection: Height: 25 m	These parameters present the maximum durations and maximum design scenarios for the permanent above ground infrastructure which have the potential to indirectly impact upon designated heritage assets through an alteration to their setting.	Primary Co145 Co151 Secondary Co30 Co159 Co193 Co195	**Likely significant effects without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Minor	Medium to High	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in ES **Volume A3, Chapter 5: Historic Environment**, changes to the Order Limits since PEIR have not had a material impact on the assessment. At PEIR, the setting assessment was incomplete; this has been updated to reflect the design changes and is presented in **Volume A6, Annex 5.1: Historic Environment Desk Based Assessment**.This approach was agreed vial email correspondence with Mr Keith Emerick at Historic England on 14th November 2019 (ON-HIS-5.4). In addition to this, following the change in the basis for assessment in the ES (i.e. the change to the updated DMRB assessment methodology) this impact is considered 'slight' (not significant) and is therefore not considered in detail in the ES.	N/A	N/A	**No Significant Effect**
HE-O-6	Onshore Substation	Operation	**Indirect (non-physical) impacts on non-designated heritage assets: Operation Phase** As a result of the presence of infrastructure in the landscape with the potential to result in a change in setting of assets.	**Onshore Substation and Energy Balancing Infrastructure:** • Onshore Operational life: 35 years **OnSS:** • Permanent area (inclusive of landscaping and attenuation): 164,000 m2 • Main Buildings: Number: 2, Length: 240 m (if single building), Width: 80m (if single building), Height: 25 m • Secondary Buildings: Number: 15, Total Combined Area: 7,000m2, Height: 15 m • Height of fire walls: 25 m • Height of lightning protection for main building: 30 m **EBI:** • Main and Secondary Buildings: Total Area (within permanent infrastructure area): 17,300 m2 • Main buildings: Height: 15 m • Secondary buildings: Height: 20 m (type one) • Height of fire walls: 25 m • Lightning protection: Height: 25 m	These parameters present the maximum durations and maximum design scenarios for the permanent above ground infrastructure which have the potential to indirectly impact upon non-designated heritage assets through an alteration to their setting.	Secondary Co30 Co159 Co193 Co195	**Likely significant effects without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Minor	Low to High	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in **Volume A3, Chapter 5: Historic Environment**, changes to the Order Limits since PEIR have not had a material impact on the assessment. At PEIR, the setting assessment was incomplete; this has been updated to reflect the design changes and is presented in **Volume A6, Annex 5.1: Historic Environment Desk Based Assessment**. This approach was agreed vial email correspondence with Mr Keith Emerick at Historic England on 14th November 2019 (ON-HIS-5.4). In addition to this, following the change in the basis for assessment in the ES (i.e. the change to the updated DMRB assessment methodology) this impact is considered 'slight' (not significant) and is therefore not considered in detail in the ES.	N/A	N/A	**No Significant Effect**
HE-D-7	All-Onshore	Decommissioning	**Direct (physical) impacts on designated heritage assets: Decommissioning Phase** Decommissioning activities which may lead to the disturbance of or removal of assets.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Primary Co2 Tertiary Co127 Co181	**No likely significant effects** **(Magnitude - None, Sensitivity - Medium-High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS regarding the identified impact tp be scoped out (PINS Scoping Opinion, November 2018, ID:4.17.2). Consistent approach to desommissioning applied to all other impacts and scoped out at PEIR. Decommissioning of the onshore infrastructure for Hornsea Four will comprise the following activities: - Buried export cables left in situ, with cable ends cut, sealed and securely buried. Partial removal of cables at landfall occur for aluminium/steel recycling; - Joint Bays and Link boxes will typically be left in situ, or removed if feasible; and - The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. The site will be returned to its previous condition. Further details will be provided and secured within a Decommissioning Plan, agreed with stakeholders prior to decommissioning commencing. The decommissioning footprint is anticipated to be similar to the construction footprint and avoid all designated heritage assets. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four. For HE-D-7, the magnitude is None (negligible using updated definitions) as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 5: Historic Environment**). For HE-D-8,9 and 10 the magnitude is No Change to Large as presented at EIA Scoping.	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	All above ground infrastructure will be removed and the land reinstated (see **Volume A1, Chapter 4: Project Description** for further details). All project mitigation and commitments apply for decommissioning and a decommissioning plan will be developed in line with the latest relevant available guidance (Co127). Further details on Co127 are provided in **Volume A4, Annex 5.2: Commitments Register**. The exclusion of this impact from the ES chapter was agreed through consultation with ERYC, HAP and Historic England at the Technical Panel Meeting held on the 2nd April 2019, as detailed in **Volume A3, Chapter 5**, Section 5.4 (ON-HIS-5.1). The conclusion of No LSE as set out in the Scoping Report, and with further justification in the PEIR, remain non-significant in EIA terms.	N/A	N/A	**No Significant Effect**
HE-D-8	All-Onshore	Decommissioning	**Direct (physical) impacts on non-designated heritage assets: Decommissioning Phase** Decommissioning activities which may lead to the disturbance of or removal of assets.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary Co127 Co181	**Likely significant effect without mitigation**	**Not considered further in the EIA, further justification provided in column L**		N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**		N/A	N/A	**No Significant Effect**
HE-D-9	All-Onshore	Decommissioning	**Indirect (non-physical) impacts on designated heritage assets: Decommissioning Phase** Decommissioning activities which may lead a change in the setting of assets.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary Co127 Co181	**Likely significant effect without mitigation**	**Not considered further in the EIA, further justification provided in column L**		N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**		N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
HE-D-10	All-Onshore	Decommissioning	**Indirect (non-physical) impacts on non-designated heritage assets: Decommissioning Phase** Decommissioning activities which may lead to the disturbance of or removal of assets.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary Co127 Co181	**Likely significant effect without mitigation**	**Not considered further in the EIA, further justification provided in column L**		N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**		N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
LUA-C-1	All-Onshore	Construction	**Temporary disruption / reduction in agricultural land:** Impacts of construction on agricultural land and farm holdings resulting in temporary disruption or reduction in land available for farming activities.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months **Onshore Eport Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Permanent access road: Number: 1, Length: 1,800 m, Width: 15m (7m road, 8m soil storage) **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	These parameters represent maximum ground disturbance conditions both in terms of potential area affected and in duration for Hornsea Four project elements that have the potential to disrupt agricultural land and farm holdings. It is considered that details related to intertidal working, and specific details on project infrastructure within the working area is not relevant to this assessment. This is because the maximum extent of ground disturbance has been assessed.	Primary Co63 Secondary Co68 Tertiary Co8 Co10 Co19 Co61 Co124	**Likely significant effects without mitigation**	**Simple Assessment**	Amendment to the definition of 'detailed' and 'simple' assessment resulted in an amendment to a simple assessment at PEIR. The approach to assessment remained consistent with that proposed at EIA Scoping.	Minor	Very High	**No Significant Effect (Minor Adverse)**	**Simple Assessment**	No LSE was identified in the PEIR (Volume 3, Chapter 6, Section 6.11) due to the temporary nature of the construction phase, the linear nature of the onshore ECC and the amount of land available within the wider ERYC area for agriculture. However, a review of the assessment methodology was requested in a Section 42 response. A reassessment of the impact is therefore provided in the ES.	Minor	Very High	**No Significant Effect (Slight Adverse)**
LUA-C-2	Landfall / Onshore ECC	Construction	**Temporary disruption to coastal recreation:** Impacts of construction may affect recreational use of the coast through temporary disruption to beach access and coastal paths.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Beach closure: 0 months, unless an unforeseen and unplanned event occurs requiring emergency access. • HDD cable ducts: Number: 8, Diameter: 1m, Length: 1.5 km • HDD Entry Pits: Area: 125 m2 per entry pit, Depth: 6 m • HDD burial depth: Maximum: 40 m, Minimum: 5 m • HDD Exit Pits: Number: 8, Area: 900 m2 per exit pit, Depth: 5 m • Temporary onshore/intertidal exit pit working area: 1,600 m2 per exit pit • HDD noise level: 120 dB • Simultaneous HDDs: Number: 3	These parameters represent maximum amount of activity on the beach which could affect nearby recreational and other land use.	Primary Co79 Tertiary Co124 Secondary Co158 Co165 Co192	**No likely significant effects** **(Magnitude - Small, Sensitivity - Low)**	**Simple Assessment**	Scoped into assessment at PEIR based on PINS scoping opinion (PINS Scoping Opinion, November 2018, ID:4.18.1.1).	Minor	Medium	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	This impact was assessed as part of the EIA, as set out in the PEIR (Volume 3, Chapter 6, Section 6.11), and no likely significant effect was identified. Given the update in the MDS, whereby no beach closure will occur apart from in emergencies and a long-term diversion put in place for one coastal PRoW (see Outline PRoW Management Plan, which forms appendix C of Volume F2, Annex 2, Code of Construction Practice), no changes are considered to affect the no LSE status of this impact identified at PEIR. Given the change in the basis for assessment in the ES (i.e. the change to the updated DMRB assessment methodology) this impact is considered 'slight' (not significant) and is therefore not considered in detail in the ES, as agreed with ERYC (ON-HUM-3.6).	N/A	N/A	**No Significant Effect**
LUA-C-3	All- Onshore	Construction	**Impacts on recreation and amenity:** Impacts of construction may affect recreational resources and amenity (noise, dust, and traffic movements)	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Beach closure: 0 months, unless an unforeseen and unplanned event occurs requiring emergency access. • Noise levels during construction of Transition Joint Bays: 115 dB **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places) • Noise levels: Cable Installation: 108 dB, Construction of Joint Bays: 115 dB **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Noise levels: 108 dB **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m **Traffic Movements:** • Peak two-way daily HGV movements in one month: 874 • Peak two-way daily LCV movements: 368	The MDS represents the greatest extent of the proposed construction works which wold result in noise, dust and traffic impacts. Further details are provided within the respective tabs for each topic area.	Primary Co134 Tertiary Co114 Co123 Co124 Secondary Co192	**Likely significant effects without mitigation**	**Simple Assessment**	N/A as impact scoped in. Detailed Assessment provided within Air Quality, Noise and Vibration, and Traffic and Transport, where appropriate. Impact to be assessed within Land Use and Agriculture Chapter within the 'Inter-related' effects section.	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	This impact was assessed as part of the EIA, set out in the PEIR (Volume 3, Chapter 6, Section 6.11). No likely significant effects were identifiedand and as such the impact referred to other technical chapters (i.e. chapters for: noise and vibration; air quality; and traffic and transport) for further information as no chapter specific impacts were identified. As no changes have been identified since PEIR that affect this assessment this impact is not considered in detail in the ES, as agreed with ERYC (ON-HUM-3.6).	N/A	N/A	**No Significant Effect**
LUA-C-4	All- Onshore	Construction	**Severance, temporary diversion or closure:** Impacts of construction may affect National Cycle network Routes, other PRoW and promoted routes, resulting in severance, temporary diversion or closure.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,600 m, Width: 15m (7m road, 8m soil storage) **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	The MDS represents the greatest extent (spatial and temporal) of the proposed construction works which would result in the greatest disruption to users of PRoWs or cycle routes. It is considered that details related to intertidal working, and specific details on project infrastructure within the working area is not relevant to this assessment. This is because the maximum extent of ground disturbance has been assessed.	Primary: Co79 Tertiary: Co124 Secondary: Co158 Co165	**Likely significant effects without mitigation**	**Simple assessment**	Amendment to the definition of 'detailed' and 'simple' assessment resulted in an amendment to a simple assessment at PEIR. The approach to assessment remained consistent with that proposed at EIA Scoping.	Minor	High to Medium	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	This was assessed as part of the EIA, set out in the PEIR (Volume 3, Chapter 6, Section 6.11), and no likely significant effect was identified. Temporary diversions or closures and associated signage will be applied to the PRoW (Co79). Measures will be agreed with ERYC as set out in the Outline PRoW Management Plan, which forms appendix C of Volume F2, Annex 2, Code of Construction Practice. Such embedded mitigation and confirmation of the PRoW affected has not identified any change to the assessment set out in the PEIR. Given the change in the basis for assessment in the ES (i.e. the change to the updated DMRB assessment this impact is considered 'slight' (not significant) and is therefore not considered in detail in the ES. In addition, the removal of this impact from the ES Chapter was agreed with ERYC during the PRoW meeting in Beverley on the 29th October 2019 (ON-HUM-3.7).	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report				Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
LUA-O-5	Onshore substation	Operation	**Severance, temporary diversion or closure:** Impacts of construction may affect National Cycle network Routes, other PRoW and promoted routes, resulting in severance, temporary diversion or closure.	**Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 • Temporary access road: Number: 1, Length: 1,800 m, Width: 1.5m (7m road, 8m soil storage) **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	The MDS represents the greatest extent (spatial and temporal) of the proposed construction works which would result in the greatest disruption to users of PRoWs or cycle routes. It is considered that details related to intertidal working, and specific details on project infrastructure within the working area is not relevant to this assessment. This is because the maximum extent of ground disturbance has been assessed.	Primary: Co79	**Impact not identified at Scoping**	**Simple assessment**	Impact not identified at EIA Scoping but introduced at PEIR due to permanent disruption to PRoWs being identified at the OnSS after site selection.	Minor	Medium	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	This was assessed as part of the EIA, set out in the PEIR (Volume 3, Chapter 6, Section 6.1.1), and no likely significant effect was identified. Permanent diversions and associated signage will be applied to a small number of PRoW (Co79). Measures will be agreed with ERYC as set out in the Outline PRoW Management Plan, which forms appendix C of Volume F2, Annex 2, Code of Construction Practice. Such embedded mitigation and confirmation of the PRoWs affected has not identified any change to the assessment set out in the PEIR. Given the change in the basis for assessment in the ES (i.e. the change to the updated DMRB assessment this impact is considered 'slight' (not significant) and is therefore not considered in detail in the ES. In addition, the removal of this impact from the ES Chapter was agreed with ERYC during the PRoW meeting in Beverley on the 29th October 2019. (ON-HUM-3.7).	N/A	N/A	**No Significant Effect**
LUA-O-6	All-Onshore	Operation	**Permanent disruption / reduction of land:** Impacts of operation and maintenance of the cable route corridor and onshore substation may affect Agricultural Land and farm holdings, resulting in permanent disruption or reduction in land available for farming activities.	N/A as impact scoped out.	N/A as impact scoped out.	Tertiary: Co10	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - High)**	**Scoped out**	Not required as agreement achieved during EIA Scoping. *"The Inspectorate agrees that significant effects from disruption from reduction of land are not likely during the operational phase of Hornsea Four, subject to the implementation of the proposed reinstatement as described in Co.10 to be secured by inclusion in the draft Code of Construction Practice and DCO* *Therefore, it is agreed that this matter can be scoped out of the ES".* (PINS Scoping Opinion, November 2018, ID:4.18.2) The onshore ECC is on agricultural land and areas considered "Best and most versatile" agricultural land (ALC Grades 1, 2 and 3a) may be affected. Sections of the onshore ECC may also be affected temporarily if repair/investigation activities are required, although impacts would be minimal and likely short lived. The potential effects resulting from the Transition Joint Bays, Joint Bays s and Link Boxes would be fragmented and would not result in the direct loss or severance of fields used for agricultural use. The OnSS comprises the only permanent above ground infrastructure which would materially impact agricultural land. The site of the permanent infrastructure is under 20ha and would therefore not result in a significant effect.	N/A	N/A	**No Significant Effect**	**Scoped out**	Not required as agreement to scope out was achieved during EIA Scoping and no further impacts have been identified.	N/A	N/A	**No Significant Effect**
LUA-D-7	Onshore Substation	Decommissioning	**Temporary disruption / reduction in land:** Impacts of decommissioning above ground installations may temporarily affect Agricultural Land and farm holdings, resulting in temporary disruption or reduction in land available for farming activities.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary: Co127	**No likely significant effects (Magnitude - Negligible, Sensitivity - High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.18.3). Decommissioning of the onshore infrastructure for Hornsea Four will comprise: - Buried export cables left in situ, with cable ends cut, sealed and securely buried. Partial removal of cables at landfall occur for aluminium/steel recycling; - Joint Bays and Link boxes will typically be left in situ, or removed if feasible; and - The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. The site will be returned to its previous condition. Further details will be provided and secured within a Decommissioning Plan, agreed with stakeholders prior to decommissioning commencing. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (Volume A3, Chapter 6: Land Use and Agriculture).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	An assessment of the potential impacts of the decommissioning above ground installations on agricultural land and farm holdings within the OnSS are not considered in detail in the EIA, through commitment Co127. This commitment ensures that a decommissioning plan will be developed to remove all onshore above ground infrastructure and the decommissioning of below ground infrastructure. It is therefore considered the impacts associated with the decommissioning phase will be of equal or lower magnitude to those identified for the construction phase (noting that no significant effects have been identified in relation to the construction phase). Approach agreed with ERYC (ON-HUM-3.7).	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
TT-C-1	All- Onshore	Construction	**Impact from transport of offshore project components on the road network: Construction Phase** Pre-fabricated off-shore construction elements (wind turbines/foundations etc.) could affect traffic if transported by road.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	N/A	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Low)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID.4.19.1). Agreement with ERYC at the Technical Panel Meeting held on the 1st May 2019 that offshore impacts can be scoped out (ON-HUM-3.8). The Applicant is currently considering ports suitable for the construction base for the offshore elements of Hornsea Four but no decision has been made at this time. A wide area across the southern North Sea is being considered including ports such as Grimsby, Immingham, Hull, Felixstowe and Teesside. Other ports in the area may also be suitable for the construction port. Port selection will be dependent upon, and only take place following, grant of development consent for Hornsea Four, a Contract for Difference (CfD) and on the findings of further technical studies and commercial negotiations which are informed by the DCO and CfD. As such, the DCO application for Hornsea Four will not include development activities at potential construction ports. Where necessary, any such development activity would be subject to separate consent(s) such as a planning permission or a Harbour Revision Order. Some large electrical infrastructure for the Onshore Substation, such as transformers, would be delivered by sea to a construction port and transferred as an Abnormal Indivisible Load (AIL) via the local road network to the development site. For the purposes of assessment, the nearest such port (King Georges Dock Hull) is assessed for impacts upon abnormal loads TT-C-9. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 7: Traffic and Transport**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	This impact is not considered in detail in the ES chapter, as agreed with ERYC at the second Human Environment Technical Panel on the 1 May 2019 that the movement of offshore components can be scoped out (ON-HUM-3.8). The Applicant is currently considering ports suitable for the construction base for the offshore elements of Hornsea Four, but no decision has been made at this time. A wide area across the southern North Sea is being considered including ports such as Grimsby, Immingham, Hull, Felixstowe and Teesside. Other ports in the area may also be suitable for the construction port. Port selection will be dependent upon, and only take place following, grant of development consent for Hornsea Four, a Contract for Difference (CfD) and on the findings of further technical studies and commercial negotiations which are informed by the DCO and CfD. As such, the DCO application for Hornsea Four will not include development activities at potential construction ports. Where necessary, any such development activity would be subject to separate consent(s) such as a planning permission or a Harbour Revision Order.	N/A	N/A	**No Significant Effect**
TT-C-2	All- Onshore	Construction	**Impact on Driver Delay on regionally, nationally or internationally significant roads: Construction Phase** Additional construction traffic may influence driver delay on the strategic road network (SRN).	Earliest construction commencement year: 2024 **Landfall:** •Construction duration: 32 months •Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months •HDD: Number: 8 •Transition Joint Bays (located within Landfall compound area): Number: 6, Depth: 6m **Onshore Export Cable Corridor:** •Construction duration: 30 months •Primary logistics compounds: Number 1, size 1.40x1.40 m, duration 36 months •Secondary logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months •ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 •Cable circuits (High Voltage Alternating Current (HVAC) system): Number: 6 •Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m •Haul Road: Number: 1, Width: 6 m, Length: 37 km, Depth: 0.4 m •Temporary access roads: Length: 5.1 km, (approximate), Width: 6 m, Depth: average of 0.4 m •Joint Bays: Number: 240, Area: 40 m2 per Joint Bay •HDDs: Number: 112, HDD compounds (entry and exit): 45 50x50 m compounds **Onshore Substation and Energy Balancing Infrastructure:** •Construction duration: 43 months •Temporary access road: Number: 1, Length: 1,800 m, Width: 15 m (7 m road, 8 m soil storage) •Permanent infrastructure area: 1.55,000 m2 •Temporary works area: 1.30,000 m2 **400 kV ECC:** •Cable circuits: Number: 4 •Cable trench depth: 1.5 m •Length: 2,100 m, Width: 60 m **Associated Peak Movements and Routing:** •Peak HGV movements: 838 two-way HGV movements per day (inclusive of 10% increase accounting for incidental deliveries and theoretical MDS based on the peak month of construction activity, accounting for potential acceleration or slippage of activities) •Construction Routing: All HGV traffic is assumed to have an origin on either the M62/A63 west of Hull or from the ports located along the A63/A1033 within Hull •Peak light vehicle movements to the ECC (excluding the Onshore substation (OnSS) and Energy Balancing Infrastructure (EBI)) (inclusive of 10% increase accounting for movements between work areas and incidental deliveries throughout the day): Total movements capped at 404 two-way light vehicle movements per day. Due to the difficulty of forecasting a detailed construction programme, a MDS of 108 two-way light vehicle movements have been assigned to each access at one time. However, movements have been capped on individual road link to 404 per day to ensure impacts are realistic on main A roads. •Peak light vehicle movements to the OnSS and EBI: a MDS of 550 two-way light vehicle movements (inclusion of a 10% to account for movements between work areas and incidental deliveries throughout the day) has been assumed to the OnSS and EBI. •All employees are assumed to drive themselves to work, with no sharing, bus, walking or cycling. •All materials and plant are assumed to be delivered by road with no reduction of HGV traffic due to the use of rail.	The MDS would result in the highest numbers of vehicle movements across the highway network. The earliest construction year (2024) represent the worst case. Agreement with ERYC at the Technical Panel on the 1 May 2019 that for the PEIR, the driver delay assessment would present details of peak hour traffic flows through critical junctions. ERYC advised at the same Technical Panel meeting that the assessment should look at the following junctions: * A164/Jocks Lodge; * All roundabout junctions along the A164 to the south towards the Humber Bridge; * B1230 junction with Coppleflat Lane to the east of Walkington; * A1079/ A1174 junction; and * Fraisthorpe junction with the A165	Primary: Co1 Co36 Co150 Tertiary: Co124 Co144 Secondary: Co62 Co171	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Moderate	High	**No Significant Effect (Minor Adverse)**	**Impact not considered within the ES.**	During consultation with Highways England, ERYC and HCC it was agreed that rather than undertake a detailed assessment of sensitive junctions for the DCO application submission, it would be more appropriate to defer assessment until post determination (ON-HUM-2.8). The rationale for this approach is that there would be greater certainty regarding a number of traffic variables, including: •The final construction programme, including details of the monthly breakdown of HGV and employee demand throughout construction; •Details of the peak and average HGV movements; •Details of the peak and average employee movements; •The anticipated mode of travel to be used by employees, i.e. the proportion that would use public transport, car-share, etc; •Details of the origin and destination of employees and HGV traffic; •Proposed HGV hourly profiles; •Proposed employee shift patterns; and •Timing of planned network improvements. The oCTMP, submitted with this DCO application (as Appendix F of **Volume F2, Chapter 2: Outline Code of Construction Practice**), includes the commitment to submitting the further assessment of traffic flows through sensitive junctions in advance of construction to inform an agreement whether further mitigation may be required. The mitigation measures would be agreed with National Highways, HCC and ERYC to ensure that residual impacts are not significant. Mitigation measures would be applied on a hierarchical basis with soft travel planning measures (e.g. use of minibuses or staggering shift times) being preferred to harder engineering measures (e.g. junction improvements).	N/A	N/A	**No assessment presented within the ES**
TT-C-3	All- Onshore	Construction	**Impact on Driver Delay on locally significant roads: Construction Phase** Additional construction traffic may influence driver delay.		The MDS would result in the highest numbers of vehicle movements across the highway network. The earliest construction year (2024) represent the worst case.	Primary: Co1 Co36 Co150 Tertiary: Co124 Co144 Secondary: Co62 Co171	**Likely significant effects without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Moderate	High	**No Significant Effect (Minor Adverse)**	**Impact not considered within the ES.**		N/A	N/A	**No assessment presented within the ES**
TT-C-4	All- Onshore	Construction	**Impact on Driver Delay on local roads and past locally sensitive receptors: Construction Phase** Additional construction traffic may influence driver delay and affect sensitive receptors			Primary: Co1 Co36 Co150 Tertiary: Co124 Co144 Secondary: Co62 Co171	**Likely significant effects without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Moderate	High	**No Significant Effect (Minor Adverse)**	**Detailed Assessment**	No LSE was identified in the PEIR assessment, however following the submission of the PEIR, through revisions to the engineering assumptions there has been an overall reduction in HGV numbers but an increase in employee numbers. In addition, there have also been revisions to the locations of a number of the proposed onshore accesses. Consequently the assessment has been revisited to ensure that impacts are no greater than previously assessed. Furthermore, at a meeting with ERYC (on the 2 October 2019) and Hull City Council (on the 25 November 2019) amendments to the study area presented at PEIR were requested. These additional links (forming the amended study area) are also subject to detailed assessment (ON-HUM-2.8 and ON-HUM-1.13).	Slight	High	**No Significant Effect (Slight Adverse)**
TT-C-5	All- Onshore	Construction	**Impact on Driver Delay on very minor local roads, parts of roads or uni-directional impact: Construction Phase** Additional construction traffic may influence driver delay			Primary: Co1 Co36 Co150 Tertiary: Co124 Co144 Secondary: Co62 Co171	**No likely significant effects** **(Magnitude - Large, Sensitivity - Negligible)**	**Detailed Assessment**	Agreement with ERYC at the 7 January 2019 Technical Panel that in addition to considering driver delay impacts associated with an increase in traffic that consideration of driver delay resulting from the use of narrow road where two vehicles (especially HGVs) can not pass will be undertaken. Agreement with ERYC at the Technical Panel meeting on the 1 May 2019 that for PEIR this would include details of likely traffic flows along each link and a description of potential mitigation measures. (ON-HUM-1.9).	Negligible to Major	High	**No Significant Effect (Minor Adverse)**	**Detailed Assessment**	No LSE was identified in the PEIR assessment, however following the submission of the PEIR, through revisions to the engineering assumptions there has been an overall reduction in HGV numbers but an increase in employee numbers. In addition, there have also been revisions to the locations of a number of the proposed onshore accesses. Consequently the assessment has been revisited to ensure that impacts are no greater than previously assessed. Furthermore, at a meeting with ERYC (on the 2 October 2019) and Hull City Council (on the 25 November 2019) amendments to the study area presented at PEIR were requested. These additional links (forming the amended	Slight	High	**No Significant Effect (Slight Adverse)**

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TT-C-6	All- Onshore	Construction	**Severance: Construction Phase** The temporary impact of the construction work may affect severance of routes/cause severance.		The MDS would result in the highest numbers of vehicle movements across the highway network.	Primary: Co1 Co36 Co150 Tertiary: Co124 Co144 Secondary: Co62 Co171	**No likely significant effects** **(Magnitude - Small, Sensitivity - Low)**	**Detailed Assessment**	N/A as impact scoped in	Negligible to Major	Low to High	**No Significant Effect (Minor Adverse)**	**Detailed Assessment**	study area) are also subject to detailed assessment (ON-HUM-2.8 and ON-HUM-1.1.3).	Slight	Low to High	**No Significant Effect (Slight Adverse)**
TT-C-7	All- Onshore	Construction	**Pedestrian delay and amenity: Construction Phase** The temporary impact of the construction work may affect pedestrian delay and amenity		The MDS would result in the highest numbers of vehicle movements across the highway network.	Primary: Co1 Co36 Co150 Tertiary: Co124 Co144 Secondary: Co62 Co171	**Likely significant effects without mitigation.**	**Detailed Assessment** (pedestrian delay scoped out, and considered as part of wider amenity assessment).	N/A as impact scoped in	Negligible to Major	Low to High	**No Significant Effect (Minor Adverse)**	**Detailed Assessment**		Slight	Low to High	**No Significant Effect (Slight Adverse)**
TT-C-8	All- Onshore	Construction	**Accidents and Road Safety: Construction Phase** The temporary impact of the construction work may affect accidents and road safety.		The MDS would result in the highest numbers of vehicle movements across the highway network.	Primary: Co1 Co36 Co150 Tertiary: Co124 Co144 Secondary: Co62 Co171	**Likely significant effects without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Negligible to Major	High	**No Significant Effect (Minor Adverse)**	**Detailed Assessment**		Slight	High	**No Significant Effect (Slight Adverse)**
TT-C-9	All- Onshore	Construction	**Abnormal Loads: Construction Phase** The temporary impact of hazardous, dangerous and abnormal loads during construction works.	**Onshore Export Cable Corridor, Cable Drums:** • Weight: 32,700kg • To be transported on an articulated HGV with a low loader/ load bed trailer. The vehicle and trailer combination would have an overall length of approximately 24m. **Onshore Substation and Energy Balancing Infrastructure: Transformers:** • Number: 6, Weight: 387,000kg, Height: 5.0m, Length: 11.65m, Width: 4.2m. • To be transported by a specialist abnormal load vehicle of approximately 93m in length.	The largest load required to be transported to site would require the largest vehicle, therefore having the greatest potential impact upon structures, highway condition, and manoeuvrability	Primary: Co150 Tertiary Co144	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	N/A	N/A	**No assessment presented at PEIR**	**Detailed Assessment**	A detailed Abnormal Load Study (**Volume A6, Annex 7.2: Abnormal Load Study**) has been undertaken and accompanies the ES Traffic and Transport Chapter (**Volume A3, Chapter 7: Traffic and Transport**). The study has been undertaken by Mammoet (heavy transportation and lifting contractors) to inform the management measures required to deliver abnormal indivisible loads (AILs) to the Onshore substation for Hornsea Four. The study has identified that the load could come from the Hull Port, and two routes from the port to the Onshore substation have been assessed, these are: Route 1: Heading west from the King George Dock via the A63 to the A164 and then heading north on the A164 before travelling east to the OnSS access from the A1079; or Route 2: Heading north from King George Dock via the Markfleet Avenue, before continuing west along Ings Road, Cavendish Road and Sutton Road to the junction with the A1033. The AIL vehicle would then follow the A1033 before continuing on to the A1079 to reach the OnSS access from the A1079.	The AIL study highlights that both route 1 and 2 would require local accommodation works. Route 1 would also require an overall marginal reduction in the height of the load to be feasible. With the application of the management measures, the magnitude of effect is considered to be minor.	Consultation with Highways England has identified that during the construction of A63 Castle Street improvements it may not be possible for AILs to traverse via Route 1. Route 1 is therefore considered to be of high sensitivity. ERYC have confirmed that they would support the use of Route 2, this route is therefore considered to be of low sensitivity.	**No Significant Effect.**
TT-O-10	All- Onshore	Operation	**Impacts from traffic generation: Operation** Potential traffic impacts arising from the operation and maintenance of the onshore elements	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effect** **(Magnitude - Negligible, Sensitivity - Low)**	**Scoped out**	Agreement from PINS during EIA Scoping (November 2018, ID:4.19.4) and with ERYC at the first Human Environment Technical Panel meeting on 7 January 2019 that operational impacts can be scoped out (ON-HUM-1.1). The rationale for this agreement being the low levels of operational traffic demand. Onshore operation and maintenance will be largely preventative and corrective, with remote monitoring of the onshore cables and onshore substation. Further details of the operation of Hornsea Four are provided in **Volume A1, Chapter 4: Project Description**.	N/A	N/A	**No Significant Effect**	**Not considered in detail in the ES. No likely significant effect identified at Scoping**	Agreement from PINS during EIA Scoping (November 2018, ID:4.19.4) and with ERYC at the first Human Environment Technical Panel meeting on 7 January 2019 that operational impacts can be scoped out (ON-HUM-1.1). The rationale for this agreement being the low levels of operational traffic demand. Onshore operation and maintenance will be largely preventative and corrective, with remote monitoring of the onshore cables and onshore substation. Further details of the operation of Hornsea Four are provided in **Volume A1, Chapter 4: Project Description**.	N/A	N/A	**No Significant Effect**
TT-D-11	All- Onshore	Decommissioning	**Impacts from traffic generation: Decommissioning** The temporary impact of the decommissioning work may affect driver delay, safety and other elements of the network	N/A as impact scoped out.	N/A as impact scoped out.	Tertiary: Co127	**No likely significant effect** **(Magnitude - Varied, Sensitivity - Varied)**	**Scoped out**	Agreement from PINS during EIA Scoping (November 2018, ID:4.19.5) that decommissioning impacts can be scoped out.	N/A	N/A	**No Significant Effect**	**Not considered in detail in the ES. No likely significant effect identified at Scoping**	Agreement from PINS during EIA Scoping (November 2018, ID:4.19.5) and with ERYC at the first Human Environment Technical Panel meeting on 7 January 2019 that decommissioning impacts can be scoped out (ON-HUM-3.3).	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
TT-C-12	All- Onshore	Construction	**Impact of Hornsea Four on Planned Changes in the Network: Construction Phase**	The MDS would assume that the construction phase would overlap with other projects resulting in potentially significant cumulative impacts. Two schemes have been agreed with ERYC for cumulative assessment. The Jocks Lodge scheme is currently at the planning stage and an application is due to be submitted in early 2020 with permission expected in spring 2020. Assuming permission is granted works are expected to start in summer 2020 and take 24 months, as such works are scheduled to be complete by 2024. A DCO submission for the Castle Street scheme was submitted in September 2018 and a decision is expected in March 2020. Assuming permission is granted works are proposed to commence March 2020, with a completion date of spring 2025. The MDS would therefore assume that the Jocks Lodge and Castle Street schemes could overlap with the peak construction period for Hornsea Four.	Agreed with ERYC at the Technical Panel on the 1 May 2019 that for the PEIR the cumulative impact assessment should consider the potential for cumulative impacts with the Jocks Lodge and Castle Road highway improvement schemes. No other projects were identified.	Tertiary: Co144	**Likely significant effect without mitigation**	**Impact not considered at PEIR**	Agreed with ERYC at the Technical Panel on the 1 May 2019 that for the PEIR the cumulative impact assessment should consider the potential for cumulative impacts with the Jocks Lodge and Castle Road highway improvement schemes (ON-HUM-4.2). No other projects were identified. At the point of PEIR submission there was insufficient information in the public domain with regards to the potential construction traffic demand from these two projects to allow cumulative effects to be assessed.	N/A	N/A	**No assessment presented at PEIR**	**Impact not considered within the ES.**	Agreement with Highways England (at the Meeting held on the 5th September 2019) and ERYC (at the Technical Panel Meeting held on the 2nd October 2019) that the potential for cumulative impacts with Jocks Lodge and Castle Street Improvement schemes can be addressed post consent through the development of a Construction Traffic Management Plan (ON-HUM-4.2 and ON-HUM-4.3).	N/A	N/A	**No assessment presented within the ES**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	Project Element	Original Project Phase	Project Activity and Impact	Maximum Design Scenario (MDS)	Justification for MDS	Commitments	Likely Significance of Effect at Scoping Stage and Justification	Hornsea Four Position at PEIR	Justification for position at PEIR	Magnitude at PEIR	Sensitivity at PEIR	Likely Significant Effect at PEIR?	Hornsea Four Position at ES	Justification for position at ES	Magnitude at ES	Sensitivity at ES	Likely Significant Effect at ES?
NV-C-1	Onshore ECC	Construction	**Noise and vibration: Construction Phase** Indicative temporary works area - temporary noise and vibration from onshore cable installation (excluding HDD works).	N/A as impact scoped out.	N/A as impact scoped out.	Primary: Co36 Co41 Co49 Co134	**No likely significant effect** **(Magnitude - Small, Sensitivity - High)**	**Scoped Out**	Agreement from PINS during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.20.1).	N/A	N/A	**No Significant Effect**	**Scoped Out**	No likely significant effect. Agreed by PINS to be scoped out. (Scoping Opinion, November 2018, ID:4.20.1).	N/A	N/A	**No Significant Effect**
NV-C-2	Onshore ECC	Construction	**Noise and vibration: Construction Phase** Indicative temporary works area - temporary noise and vibration from HDD works and other trenchless technologies.	**Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) • HDD required at night, using largest equipment, required at all crossings, compound required at all crossings **Construction Equipment (Per HDD):** • Simultaneous drilling with up to 2 rigs • Tracked Excavator: Number: 1, Noise Level: 103 dB(A), 20% ontime; • HDD Drilling Rigs, 107dB(A) SWL each, 90% ontime; and • Water Pumps, 93dB(A) SWL each, 90% ontime. • Dumper: Number: 1, Noise Level: 106 dB(A), 20% ontime • Generator: Number: 1, Noise Level: 105 dB(A), 80% ontime. • Mud Recycling Unit, 1 Noise Level 101 dB(A) 90% ontime • Tractor and Trailer, 1, Noise Level 86 dBA, 40 % ontime	HDD involves the most equipment/complexity and has the limited potential for night-time working which will result in the largest impacts on residential receptors.	Primary Co36 Co41 Co49 Tertiary Co123 Co124	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Negligible (daytime, (Moderate (evening) and Major (night).	Medium	**No Significant Effect (Minor Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	This impact was assessed as part of the EIA, as set out in PEIR (Orsted, 2019) and confirmed in Volume A4, Annex 5.1: Impacts Register, and no likely significant effect was identified. It was agreed to not consider this impact in further detail in the ES through consultation with ERYC, on the 5th November 2019 (ON-HUM-3.5).	N/A	N/A	**No Significant Effect**
NV-C-3	Landfall	Construction	**Noise and vibration: Construction Phase** Landfall, nearshore and intertidal area - temporary noise and vibration from cable installation works.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • Beach closure: 0 months, unless an unforeseen and unplanned event occurs requiring emergency access. • Noise levels during construction of Transition Joint Bays: 115 dB • HDD Number: 8 • HDD required at night, using largest equipment, pit open two months, 8 vessels near (5km2 area) shore • HDD noise level: 120 dB • Simultaneous HDDs: Number: 3 **Construction Equipment (Per HDD):** • Simultaneous drilling with up to 2 rigs • Tracked Excavator: Number: 1, Noise Level: 103 dB(A), 20% ontime; • HDD Drilling Rigs, 107dB(A) SWL each, 90% ontime; and • Water Pumps, 93dB(A) SWL each, 90% ontime. • Dumper: Number: 1, Noise Level: 106 dB(A), 20% ontime • Generator: Number: 1, Noise Level: 105 dB(A), 80% ontime. • Mud Recycling Unit, 1 Noise Level 101 dB(A) 90% ontime • Tractor and Trailer, 1, Noise Level 86 dBA, 40 % ontime	HDD involves the most equipment/complexity and has the limited potential for night-time working which will result in the largest impacts on residential receptors.	Primary Co134 Tertiary Co123 Co124	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Negligible	N/A	**No Significant Effect (Not Significant)**	**Detailed Assessment**	Although No LSE was identified at PEIR, the cable installation MDS at the landfall has changed from that which was assessed in the PEIR. This impact is, therefore, assessed and presented in ES **Volume A3, Chapter 8: Noise and Vibration.**	Negligible	N/A	**No Significant Effect (Slight Adverse)**
NV-C-4	Onshore ECC	Construction	**Noise and vibration: Construction Phase** Temporary noise and vibration from constructing the jointing bays.	**Onshore Export Cable Corridor:** • Joint Bays: Number: 240, Depth 2.5 m, Area: 225 m2 per Joint Bay, Joint Bay compounds: 240 40x40 m compounds **Construction Equipment (Joint Bays):** • Bulldozer: Number: 1, Noise Level:108 dB(A) • Tracked Excavator: Number: 1, Noise Level: 107 dB(A), • Generator: Number: 1, Noise Level: 105 dB(A), 100% ontime • Water Pump: Number: 1, Noise Level: 93 dB(A), 75% ontime • Dump Truck: Number: 1, Noise Level: 115 dB(A) • Cement Mixer Truck (Discharging): Number: 1, Noise Level: 103 dB(A), 25% ontime • Truck Mounted Concrete Pump and Boom Arm: Number: 1, Noise Level: 108 dB(A), 25% ontime	The MDS uses the highest potential niumber of JBs which accounts for a worst case assessment.	Primary: Co36 Co41 Co49 Co134 Tertiary: Co124	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Negligible	N/A	**No Significant Effect (Not Significant)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	This impact was assessed as part of the EIA, as set out in PEIR (Orsted, 2019) and confirmed in Volume A4, Annex 5.1: Impacts Register, and no likely significant effect was identified. It was agreed to not consider this impact in further detail in the ES through consultation with ERYC, on the 5th November 2019 (ON-HUM-3.5).	N/A	N/A	**No Significant Effect**
NV-C-5	Onshore ECC	Construction	**Noise and vibration: Construction Phase** Temporary noise and vibration from constructing the haul road access points	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Primary: Co36 Co41 Co135	**No likely significant effect** **(Magnitude - Small, Sensitivity - High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.20.2). Construction access points from the highway network will be located at least 150 m from noise sensitive properties where possible (Co 135). Plant required for construction of the access points/roads will be no greater in number and nature to that assessed for HDD and Joint bay construction. At this distance and based on the calculations undertaken for the HDD/Jointing Bays, noise levels are predicted to be below the construction threshold and, therefore, no significant impacts are expected. The magnitude is Negligible based on the context above. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 8: Noise and Vibration**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As set out in PEIR, assessment of noise impacts due to the haul road access points along the Onshore ECC indicated that no likely significant effect is expected. There are 3 instances identified at ES where the haul road access points come closer than the 150 m set out in Co 135, however as the plant required for construction of the access points/roads will be no greater in number and nature to that assessed for HDD and Joint bay construction, noise levels are predicted to be below the construction threshold and, therefore, no significant impacts are expected. The removal of this impact from the ES chapter was agreed through consultation with ERYC, on the 7th January 2019 (ON-HUM-1.5).	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
NV-C-6	Onshore Substation	Construction	**Noise and vibration: Construction Phase** Temporary noise and vibration from construction of the onshore substation. (Includes the temporary impacts of tubular steel piling (percussive piling)	**Onshore Substation and Energy Balancing Infrastructure:** • Construction period: 43 months **Construction Equipment (OnSS and EBI):** • Tracked Excavator: Number: 2, Noise Level: 107dB(A), 75% ontime • Backhoe Loader: Number: 2, Noise Level: 96dB(A), 75% ontime • Bulldozer: Number: 2, Noise Level: 108dB(A,), 75% ontime • Dumper: Number: 2, Noise Level: 101dB(A), 75% ontime • Mobile Crane: Number: 2, Noise Level: 106dB(A), 75% ontime • Cement Mixer Truck (Discharging): Number: 1no, Noise Level: 103dB(A), 50% ontime • Truck Mounted Concrete Pump and Boom Arm: Number: 1, Noise Level: 108dB(A), 50% ontime • Piling Method - To be confirmed Percussive Piling Rig: Number 4, Noise Level (each) 117dB(A), 90% ontime Power (generator): Number 4, Noise Level (each) 70dB(A) @10m, 90% ontime	The MDS relates to the maximum activity at the OnSS and EBI, inclusive of piling activity.	Primary Co36 Tertiary Co124 Secondary Co169	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Negligible	N/A	**No Significant Effect (Not Significant)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	This impact was assessed as part of the EIA, as set out in PEIR (Orsted, 2019) and confirmed in Volume A4, Annex 5.1: Impacts Register, and no likely significant effect was identified. It was agreed to not consider this impact in further detail in the ES through consultation with ERYC, on the 5th November 2019 (ON-HUM-3.5).	N/A	N/A	**No Significant Effect**
NV-C-7	All onshore	Construction	**Noise and vibration: Construction Phase** Traffic noise	The derivation of the peak construction flows has been carried out by T&T in accordance with their MDS. Refer to Impact ID TT-C-2 to TT-C-8. Traffic flows are provided as both peak traffic AAWT and more detailed Average flow AAWT to present two cases (MDS and then average provided for context).	The MDS relates to the maximum number of movements on any one link to create the AAWT.	Primary Co135 Tertiary Co144	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Negligible to Major	Medium	**No Significant Effect (Not Significant to Moderate Adverse)**	**Detailed Assessment**	Additional transport study area within Hull City Council's area of jurisdiction includes consideration of a wider study area and additional road links in response to their consultation comments. Consideration of a wider study area is required within HCC's area of jurisdiction, following comments on the PEIR raised in a telephone meeting on 07 November 2019 and subsequent emails in December 2019. This impact is therefore assessed and presented in ES **Volume A3, Chapter 8: Noise and Vibration.**	Negligible to Major	Medium	**No Significant Effect (Slight Adverse)**
NV-O-8	Onshore Substation	Operation	**Noise and vibration: Operation Phase** Noise from the onshore substation	**Operational Noise Onshore Substation:** • Variable Shunt Reactor: Number: 12, Noise Level: 97dB(A) • Fixed Shunt Reactor: Number: 4, Noise Level: 93dB(A) • DRC: Number: 6, Noise Level: 93dB(A) • DRC Transformer: Number: 6, Noise Level: 91dB(A) • DRC Reactor: Number: 6, Noise Level: 84dB) • Super Grid Transformer: Number: 6, Noise Level: 95dB(A) • Harmonic Filter: Number:4, Noise Level: 91dB(A) **Operational Noise Energy Balancing Infrastructure:** • MV/LV Transformers: Number:100, Noise Level: 65dB(A) • Power Converters: Number: 100, Noise Level: 85dB(A) • Battery Area: Noise Level: 84dB(A) • Central AC Units: Number: 2, Noise Level: 80dB(A)	The HVAC is considered to be the MDS due to the amount of external equipment compared to HVDC.	Secondary Co159	**Likely significant effect without mitigation**	**Detailed Assessment**	N/A as impact scoped in	Negligible to Major	Medium	**No Significant Effect (Not Significant to Moderate Adverse)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	This impact was assessed as part of the EIA, as set out in PEIR (Orsted, 2019) and confirmed in Volume A4, Annex 5.1: Impacts Register, and no likely significant effect was identified (with the inclusion of Co159). OnSS noise modelling mitigation has been undertaken in compliance with Co159, and the outcome and subsequent mitigation detailed within **Volume F2, Chapter 13: Outline Design Plan.** It was agreed to not consider this impact further in the ES through consultation with ERYC, on the 5th November 2019 (ON-HUM-3.5).	N/A	N/A	**No Significant Effect**
NV-O-9	ECC	Operation	**Noise and vibration: Operation Phase** Noise from buried cables	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effect** **(Magnitude - No Change, Sensitivity - High)**	**Scoped Out**	Agreement from PINS during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.20.3).	N/A	N/A	**No Significant Effect**	**Scoped Out**	No likely significant effects. Agreed by PINS to be scoped out (Scoping Opinion, November 2018, ID:4.20.3, ID:4.20.4, ID:4.20.5 and ID:4.20.6).	N/A	N/A	**No Significant Effect**
NV-O-10	Onshore Substation	Operation	**Noise and vibration: Operation Phase** Operational Traffic Noise	N/A as impact scoped out.	N/A as impact scoped out.	Tertiary Co137	**No likely significant effect** **(Magnitude - Negligible, Sensitivity - High)**	**Scoped Out**	Agreement from PINS during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.20.4).	N/A	N/A	**No Significant Effect**	**Scoped Out**		N/A	N/A	**No Significant Effect**
NV-O-11	Onshore Substation	Operation	**Noise and vibration: Operation Phase** Noise and vibration from routine maintenance activities	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effect** **(Magnitude - Negligible, Sensitivity - High)**	**Scoped Out**	Agreement from PINS during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.20.5).	N/A	N/A	**No Significant Effect**	**Scoped Out**		N/A	N/A	**No Significant Effect**
NV-O-12	All onshore	Operation	**Noise and vibration: Operation Phase** Vibration	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effect** **(Magnitude - Negligible, Sensitivity - High)**	**Scoped Out**	Agreement from PINS during EIA Scoping(PINS Scoping Opinion, November 2018, ID:4.20.6).	N/A	N/A	**No Significant Effect**	**Scoped Out**		N/A	N/A	**No Significant Effect**
NV-O-13	Offshore HVAC Booster	Operation	**Noise and vibration: Operation Phase** Noise from operation of the offshore HVAC booster	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	N/A	**No likely significant effect** **(Magnitude - Negligible, Sensitivity - High)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.20.7). No likely significant effects due to the distance (>20km) offshore are predicted. Simple calculations based on the plant and equipment located at the OnSS shows that predicted noise levels from the booster are expected to be below 15 dB at onshore receptors. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 8: Noise and Vibration**).	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	As set out in PEIR, simple calculations of noise impacts associated with the Offshore HVAC Booster indicated that no likely significant effect is expected. The removal of this impact from the ES chapter was agreed through consultation with ERYC, on the 4th November 2019 (ON-HUM-1.5).	N/A	N/A	**No Significant Effect**
NV-D-14	Onshore ECC	Decommissioning	**Noise and vibration: Decommissioning Phase** Temporary noise and vibration from plant along the cable route	N/A as impact scoped out.	N/A as impact scoped out.	Tertiary Co127	**No likely significant effect** **(Magnitude - Small-Large, Sensitivity - High)**	**Scoped Out**	Agreement from PINS during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.20.8).	N/A	N/A	**No Significant Effect**	**Scoped Out**	No likely significant effects. Agreed by PINS to be scoped out (Scoping Opinion, November 2018, ID:4.20.8).	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
NV-D-15	Onshore Substation	Decommissioning	**Noise and vibration: Decommissioning Phase** Temporary noise and vibration from plant at the onshore substation	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary Co127	**No likely significant effect** Impacts are likely to be no higher than for construction.	**Not considered further in the EIA, further justification provided in column L**	Change in position since EIA Scoping. Decommissioning of the onshore infrastructure for Hornsea Four will comprise the following activities: - Buried export cables left in situ, with cable ends cut, sealed and securely buried. Partial removal of cables at landfall occur for aluminium/steel recycling; - Joint Bays and Link boxes will typically be left in situ, or removed if feasible; and - The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. The site will be returned to its previous condition. Further details will be provided and secured within a Decommissioning Plan, agreed with stakeholders prior to decommissioning commencing. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four.	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	Impact not considered in detail and agreed with ERYC at the Human Environment Technical Panel Meeting on 7th January 2019 (ON-HUM-3.3).	N/A	N/A	**No Significant Effect**

Impact Background							EIA Scoping	Preliminary Environmental Information Report					Environmental Statement				
ID	**Project Element**	**Original Project Phase**	**Project Activity and Impact**	**Maximum Design Scenario (MDS)**	**Justification for MDS**	**Commitments**	**Likely Significance of Effect at Scoping Stage and Justification**	**Hornsea Four Position at PEIR**	**Justification for position at PEIR**	**Magnitude at PEIR**	**Sensitivity at PEIR**	**Likely Significant Effect at PEIR?**	**Hornsea Four Position at ES**	**Justification for position at ES**	**Magnitude at ES**	**Sensitivity at ES**	**Likely Significant Effect at ES?**
AQ-C-1	All-onshore	Construction	**Dust generation** Dust raising activities (earthworks, traffic on unpaved areas, construction works) from onshore construction works. This may have an effect on human and ecological receptors sensitive to dust and PM10.	**Landfall:** • Construction duration: 32 months • Landfall compound: Number: 1, Total Area: 40,000 m2, Duration: 32 months • HDD: Number: 8 **Onshore Export Cable Corridor:** • Construction duration: 30 months • Primary logistics compounds: Number: 1, Size: 140x140 m, Duration: 36 months • Secondary Logistics compounds: Number: 7, Size: 90x90 m, Duration: 36 months • ECC: Length: 39 km (approximate), Width: 80 m, Area: 3,120,000 m2 • Number of cable circuits (HVAC system): 6 • Cable trench: Depth: 1.5 m, Width at base: 1.5 m, Width at surface: 5 m • Haul Road: Number: 1, Width: 6 m (with 7 m passing places), Length: 39 km, Maximum Depth: 1 m, Average Depth: 0.4 m • Temporary access roads: Number: 36, Width: 6 m (with 7 m passing places), Maximum Depth: 1m, Average Depth: 0.4 m • HDDs: Number: 112, HDD compounds (entry and exit):224 70x70 m compounds, HDD compounds hardstanding: 46 50x50 m (at approximately 20% of all HDD locations) **Onshore Substation and Energy Balancing Infrastructure:** • Construction duration: 43 months • Permanent infrastructure area: 164,000 m2 • Temporary works area: 130,000 m2 **400 kV ECC:** • Number of cable circuits: 4 • Cable trench depth: 1.5m • Approximate Length: 1 km • Width: 60 m	The MDS represents the maximum inpacts from dust.	Primary Co49 Co134 Co135 Tertiary Co64 Co114 Co124	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Medium)**	**Simple Assessment**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.21.1). Impact scoped in through simple assessment. Impact magnitude and significance not determined prior to implementation of mitigation. The commitment to implementing dust mitigation measures, as per IAQM guidance (IAQM, 2014), will ensure that impacts at receptors are not significant.	N/A	N/A	**No Significant Effect (Not Significant)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	The position on dust impacts with regard to designated sites was clarified in the Technical Panel meeting with NE on the 13 November 2019, where it was agreed that the project commitments would prevent significant impacts from occurring (ON-AQ-3.1). As no significant effect was identified at PEIR, and as no further impacts have been identified, this impact has not be assessed further in the ES. This approach has been agreed with ERYC (On-HUM-1.6).	N/A	N/A	**No Significant Effect**
AQ-A-2	All-onshore	All	**Dust generation and exhaust emissions from traffic** Construction, related traffic will be associated with emissions of dust and exhaust gases, which may affect human and ecological receptors.	The derivation of the peak construction flows has been carried out by T&T in accordance with their MDS. Refer to Impact ID TT-C-2 to TT-C-8. The Hornsea Four construction-generated traffic flows show that the assessment screening criteria (of 500 vehicles or 100 HGVs per day) is exceeded on 45 roads. The impact of this increase in traffic will therefore be assessed using dispersion modelling. Traffic flows during operation and decommissioning are scoped out of the assessment.	The MDS represents the maximum inpacts from traffic generated pollutants.	Primary Co134 Co135 Tertiary Co64 Co114 Co124	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Medium)**	**Detailed Assessment**	Scoped into assessment at PEIR based on PINS scoping opinion (PINS Scoping Opinion, November 2018, ID:4.21.2).	N/A	N/A	**No Significant Effect (Not Significant)**	**Detailed Assessment**	Impacts on human receptors within ERYC's area of jurisdiction showed no LSE at PEIR and have therefore not been considered in detail in the ES. Consideration of a wider study area is required within HCC's area of jurisdiction, following comments on the PEIR raised in a telephone meeting on 07 November 2019 and subsequent emails in December 2019. Consideration of the number of vehicles along the haul route, and additional in-combination sources of nutrient nitrogen at designated ecological sites was required to address comments raised by Natural England on the PEIR.	Negligible	N/A	**No Significant Effect**
AQ-O-3	All-onshore	Operation and Decommissioning	**Dust generation and exhaust emissions from traffic** Operation (and maintenance) and decommissioning related traffic will be associated with emissions of dust and exhaust gases, which may affect human and ecological receptors.	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	N/A	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Medium)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.21.2). Traffic associated with operational activities fall below the IAQM thresholds for the assessment of air quality. Operation and maintenance activities are largely preventative and corrective, with remote monitoring of the onshore cables and onshore substation. Further details of the operational impacts are included within Volume 1 Chapter 4 Project Description. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter**	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	Not required as impact scoped out no further impacts have been identified and approach agreed with ERYC (ON-AQ-3.1).	N/A	N/A	**No Significant Effect**
AQ-O-4	All-onshore	Operation	**Emissions from facilities** Operation and maintenance of the onshore export cable and onshore substation may affect human and ecological receptors.	N/A as impact scoped out.	N/A as impact scoped out	N/A	**No likely significant effects** **(Magnitude - No Change, Sensitivity - Negligible)**	**Scoped Out**	Not required as agreement achieved during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.21.3).	N/A	N/A	**No Significant Effect**	**Scoped Out**	Not required as agreement to scope out was achieved during EIA Scoping and no further impacts have been identified. (PINS Scoping Opinion, November 2018, ID:4.21.3).	N/A	N/A	**No Significant Effect**
AQ-D-5	Cable Route Corridor	Decommissioning	**Dust generation** Temporary impacts of decommissioning of the OnSS may affect receptors sensitive to dust (human and ecological).	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	Tertiary Co64 Co114 Co124 Co127	**No likely significant effects** **(Magnitude - Negligible, Sensitivity - Low)**	**Not considered further in the EIA, further justification provided in column L**	Disagreement from PINS (PINS Scoping Opinion, November 2018, ID:4.21.4). Decommissioning of the onshore infrastructure for Hornsea Four will comprise the following activities: - Buried export cables left in situ, with cable ends cut, sealed and securely buried. Partial removal of cables at landfall occur for aluminium/steel recycling; - Joint Bays and Link boxes will typically be left in situ, or removed if feasible; and - The OnSS above ground electrical equipment and infrastructure will be removed, along with building foundations and security fencing. The site will be returned to its previous condition. Further details will be provided and secured within a Decommissioning Plan, agreed with stakeholders prior to decommissioning commencing. The construction of Hornsea Four presents the highest potential for significant environmental effects. Impacts during decommissioning would result in an effect of equal significance, at worst. Primary, tertiary and secondary mitigation measures that are necessary to reduce significant effects during construction to acceptable levels would be secured for decommissioning activities, if relevant, and noted within technical chapters. In line with the proportionate approach to EIA, effects during decommissioning are therefore scoped out of the EIA for Hornsea Four. The magnitude is Negligible as presented at EIA Scoping. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter**	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	Not required as impact scoped out no further impacts have been identified and approach agreed with ERYC (ON-AQ-3.1).	N/A	N/A	**No Significant Effect**

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SE-C-1	All - onshore and offshore	Construction	Contributions to economic activity through construction activities	Maximum Design Scenario not appropriate for employment and GVA related impacts in this case	Effects in relation to employment and GVA generated as a result of construction activity are all beneficial, so a maximum design scenario is not appropriate here. Aside from the size of the workforce, detailed aspects of scheme design do not have a substantial bearing on the economic impact assessment. Due to the early stages of Hornsea Four, the assessment draws mainly on assumptions from industry evidence rather than specific design factors. Non-design factors (such as the selection of ports, procurement approach and the geography of the development's supply chain) are more important factors in determining the overall level of potential economic impact. Three construction scenarios have been assessed which test the sensitivity of impacts with regard to the assumptions around local and UK based benefits.	N/A	**Potential significant effects (beneficial)**	**Simple Assessment**	N/A as impact scoped in.	Humber LEP area	Humber Port: Minor, Non-Humber UK Port: Negligible, Non-UK Port: Negligible	Humber Port: High, Non-Humber UK Port: Not considered, Non-UK Port: Not considered	**No Significant Effect (Not Significant to Minor Beneficial)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in ES **Volume A3, Chapter 10**, Section 10.8, changes to the redline boundary since PEIR have not had a material impact on the assessment.	Former Humber LEP area	N/A	N/A	**No Significant Effect**
										UK	Humber Port: Negligible, Non-Humber UK Port: Negligible, Non-UK Port: Negligible	Humber Port: Not considered, Non-Humber UK Port: Not Considered, Non-UK Port: Not Considered				UK	N/A	N/A	**No Significant Effect**
SE-C-2	All - onshore and offshore	Construction	Contributions to Employment through construction activities			N/A	**Potential significant effects (beneficial)**	**Simple Assessment**	N/A as impact scoped in.	Humber LEP area	Humber Port: Minor, Non-Humber UK Port: Negligible, Non-UK Port: Negligible	Humber Port: High, Non-Humber UK Port: Not Considered, Non-UK Port: Not Considered	**No Significant Effect (Not Significant to Minor Beneficial)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in ES **Volume A3, Chapter 10**, Section 10.8, changes to the redline boundary since PEIR have not had a material impact on the assessment.	Former Humber LEP area	N/A	N/A	**No Significant Effect**
										UK	Humber Port: Negligible, Non-Humber UK Port: Negligible, Non-UK Port: Negligible	Humber Port: Not Considered, Non-Humber UK Port: Not Considered, Non-UK Port: Not Considered				UK	N/A	N/A	**No Significant Effect**
SE-C-3	All - onshore and offshore	Construction	Enabling local residents to access employment opportunities through construction activities			N/A	**Potential significant effects (beneficial)**	**Simple Assessment**	N/A as impact scoped in.	Humber LEP area	Humber Port: Moderate, Non-Humber UK Port: Minor, Non-UK Port: Negligible	Humber Port: Very High, Non-Humber UK Port: Very High, Non-UK Port: Not Considered	**No Significant Effect to LSE (Not Significant) to Major Beneficial**	**Simple Assessment**	Beneficial LSE identified at PEIR.	Former Humber LEP area	Humber Port: Minor, Non-Humber UK Port: Minor, Non-UK Port: Negligible	Humber Port: Very High, Non-Humber UK Port: Very High, Non-UK Port: Not Considered	**Neutral to Moderate Beneficial**
SE-O-4	All - onshore and offshore	Operation	Contributions to economic activity through operation and maintenance activities		Effects in relation to employment and GVA generated as a result of operation and maintenance activity are all beneficial, so a maximum design scenario is not appropriate here. Aside from the size of the workforce, detailed aspects of scheme design do not have a substantial bearing on the economic impact assessment. Due to the early stages of Hornsea Four, the assessment draws mainly on assumptions from industry evidence rather than specific design factors. Non-design factors (such as the selection of ports, procurement approach and the geography of the development's supply chain) are more important factors in determining the overall level of potential economic impact. Two O&M scenarios have been assessed which test the sensitivity of impacts with regard to the assumptions around local and UK based benefits.	N/A	**Potential significant effects (beneficial)**	**Simple Assessment**	N/A as impact scoped in.	Humber LEP area	Humber Port: Negligible, Non-Humber UK Port: Negligible	Humber Port: Not Considered, Non-Humber UK Port: Not Considered	**No Significant Effect (Not Significant)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in ES **Volume A3, Chapter 10**, Section 10.8, changes to the redline boundary since PEIR have not had a material impact on the assessment.	Former Humber LEP area	N/A	N/A	**No Significant Effect**
										UK	Humber Port: Negligible, Non-Humber UK Port: Negligible	Humber Port: Not Considered, Non-Humber UK Port: Not Considered				UK	N/A	N/A	**No Significant Effect**
SE-O-5	All - onshore and offshore	Operation	Contributions to Employment through operation and maintenance activities			N/A	**Potential significant effects (beneficial)**	**Simple Assessment**	N/A as impact scoped in.	Humber LEP area	Humber Port: Negligible, Non-Humber UK Port: Negligible	Humber Port: Not Considered, Non-Humber UK Port: Not Considered	**No Significant Effect (Not Significant)**	**Not considered further in the EIA process and not included in ES due to no Significant Effect.**	As set out in ES **Volume A3, Chapter 10**, Section 10.8, changes to the redline boundary since PEIR have not had a material impact on the assessment.	Former Humber LEP area	N/A	N/A	**No Significant Effect**
										UK	Humber Port: Negligible, Non-Humber UK Port: Negligible	Humber Port: Not Considered, Non-Humber UK Port: Not Considered				UK	N/A	N/A	**No Significant Effect**
SE-O-6	All - onshore and offshore	Operation	Enabling local residents to access employment opportunities through operation and maintenance activities			N/A	**Potential significant effects (beneficial)**	**Simple Assessment**	N/A as impact scoped in.	Humber LEP area	Humber Port: Minor, Non-Humber UK Port: Negligible	Humber Port: Very High, Non-Humber UK Port: Not Considered	**No Significant Effect to LSE (Not Significant to Moderate Beneficial)**	**Simple Assessment**	Beneficial LSE identified at PEIR.	Former Humber LEP area	Humber Port: Minor, Non-Humber UK Port: Minor, Non-UK Port: Negligible	Humber Port: Very High, Non-Humber UK Port: Very High, Non-UK Port: Not Considered	**No Significant Effects to LSE (Ranging from Neutral to Moderate Beneficial)**
SE-D-7	All - onshore and offshore	Decommissioning	Decommissioning Phase Impacts on employment and GVA	N/A as impact scoped out.	N/A as impact scoped out.	N/A	**No likely significant effects**	**Scoped out**	Agreement from PINS during EIA Scoping (PINS Scoping Opinion, November 2018, ID:4.22.1).	N/A	N/A	N/A	**No Significant Effect**	**Scoped Out**	Not required as impact scoped out no further impacts have been identified.	N/A	N/A	N/A	**No Significant Effect**
SE-A-8	All - onshore and offshore	All	Cumulative Impacts relevant to Socio-economics	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	N/A	**No likely significant effects**	**Not considered further in the EIA, further justification provided in column L**	Absence of specific response from PINS during EIA scoping. Hornsea Four will be set against a background of a variety of economic development activity and in a regional context will likely provide some economic and employment benefits. The socio-economic assessment will consider the contribution of Hornsea Four to the local, regional and national economy to the extent practicable. However, it is not proposed that positive cumulative effects with other plans and proposals are specifically assessed. This is because such benefits are a desired outcome of local, regional and national policies for economic development and Hornsea Four will simply be adding to the benefits provided from other planned development.	N/A	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	Not required as impact scoped out no further impacts have been identified.	N/A	N/A	N/A	**No Significant Effect**

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SE-A-9	All - onshore	All	Tourism Impacts	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	N/A	**No likely significant effects**	**Not considered further in the EIA, further justification provided in column L**	Absence of specific response from PINS during EIA scoping. The proposed offshore infrastructure is not close to concentrations of onshore or offshore tourism and leisure activity. Likewise, the onshore ECC and associated works are not located close to major tourism centres or tourism and leisure assets. In the absence of significant effects to the tourism economy identified in other chapters (e.g. Volume 3, Chapter 6: Land Use and Agriculture), it is not necessary to assess under Socio-economics. For the purpose of assessment it is considered that the magnitude would be no greater than Negligible. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 10: Socio-economics**).	N/A	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	Not required as impact scoped out no further impacts have been identified.	N/A	N/A	N/A	**No Significant Effect**
SE-A-10	All - onshore	All	Adequate Services and Infrastructure – Pressures on social services such as health care, education and justice	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	N/A	**No likely significant effects**	**Not considered further in the EIA, further justification provided in column L**	Absence of specific response from PINS during EIA scoping. While there will be a large construction workforce, much of it will be drawn from local and regional resources and no single community social service will be exposed to large-scale demand from workers. For the purpose of assessment it is considered that the magnitude would be no greater than Negligible. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 10: Socio-economics**).	N/A	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	Not required as impact scoped out no further impacts have been identified.	N/A	N/A	N/A	**No Significant Effect**
SE-A-11	All - onshore	All	Adequate Services and Infrastructure – Housing Pressures – eg. affordability, availability and appropriateness	N/A as impact not considered in detail in the EIA.	N/A as impact not considered in detail in the EIA.	N/A	**No likely significant effects**	**Not considered further in the EIA, further justification provided in column L**	Absence of specific response from PINS during EIA scoping. While there will be a large construction workforce, much of it will be drawn from local and regional resources and demand for temporary accommodation by those hired from outside the region will be distributed over a relatively wide area and unlikely to compete with others (e.g. domestic or tourism) for availability. For the purpose of assessment it is considered that the magnitude would be no greater than Negligible. Irrespective of the sensitivity of the receptor, the significance of the impact is not significant as defined in the assessment of significance matrix (**Volume A3, Chapter 10: Socio-economics**).	N/A	N/A	N/A	**No Significant Effect**	**Not considered further in the EIA, further justification provided in column R**	Not required as impact scoped out no further impacts have been identified.	N/A	N/A	N/A	**No Significant Effect**