



AQUIND Limited

AQUIND INTERCONNECTOR

Environmental Statement – Volume 3 – Appendix 29.3 Marine Intra-Project Effects

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(a)

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Appendix 29.3 Marine Intra-Project Effects

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WSP

WSP House

70 Chancery Lane

London

WC2A 1AF

+44 20 7314 5000

www.wsp.com

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APPENDIX 29.3 MARINE INTRA-PROJECT EFFECTS

1.1.1.1. This appendix presents the marine intra-project effects assessment tables by chapter.

Table 1 – Chapter 7 (Marine Water and Sediment Quality)

Potential interrelated impacts by chapter	Receptor/s	Interrelationship	Assessment of interrelationship in Chapter 7?	Description
Chapter 6 (Physical Processes) of the ES Volume 1 (document reference 6.1.6)				
Increased SSC/Resuspension of contaminated sediments	Marine water quality	Increased SSC/resuspension of contaminated sediments as a result of dredging and cable installation activities could lead to negative effects on water quality.	Yes.	See Section 7.6.3 of Chapter 7 (Marine Water and Sediment Quality) of the ES Volume 1 (document reference 6.1. 7). Effects are considered to be not significant through all stages of development of the Proposed Development. Consideration also included in the Marine Water Framework Directive (WFD) assessment in Appendix 7.1 of the ES Volume 3 (document reference 6.3.29.3)
The interrelationship of effects on marine water and sediment quality identified above have already been assessed in Chapter 7 (Marine Water and Sediment Quality).				

Table 2 – Chapter 8 (Intertidal and Benthic Habitats)

Potential interrelated impacts by chapter	Receptor/s	Interrelationship	Assessment of interrelationship in Chapter 8?	Description
Chapter 6 (Physical Processes)				
Increased SSC and sediment deposition (smothering)	Benthic habitats, flora and fauna.	Suspended sediments and sediment deposition may have direct impacts on benthic habitats and organisms (smothering) and indirect effects that may result from damage to feeding of benthic organisms.	Yes.	See Section 8.6.4 of Chapter 8 (Intertidal and Benthic Habitats) of the ES Volume 1 (document reference 6.1.8). Effects are considered to be not significant.
Changes in hydrodynamic regime	Benthic habitats, flora and fauna.	Changes in hydrodynamics may alter feeding success and distribution of benthic habitats and organisms	No	Changes to hydrodynamic conditions due to provision of cable protection and removal of seabed features (boulders/sand waves) were not deemed to be significant and as such no changes to benthic habitats or organisms are predicted.

Chapter 7 (Marine Water and Sediment Quality)				
Mobilisation of contaminated sediments	Benthic habitats, flora and fauna.	Mobilisation of contaminants may cause a direct toxic effect on benthic flora and fauna.	Yes.	See Section 8.6.4 of Chapter 8 Intertidal and Benthic Habitats. Effects are considered to be not significant.
Chapter 9 (Fish and Shellfish) of the ES Volume 1 (document reference 6.1.9)				
Displacement of fish resulting in increased predation on benthic flora/fauna in areas outside of the Proposed Development	Benthic habitats, flora and fauna.	Fish displaced during works could result in an increase in predation pressure on benthic organisms outside of the Proposed Development.	No.	Fish may be displaced by construction and decommissioning activities (and during unforeseen repair and maintenance) through noise and vibration, and increases in SSC. However, effects from these impacts are considered to be temporary, short in duration and the area into which fish have the potential to be displaced is considerably larger than the Proposed Development suggesting that any increase in predation of benthic receptors outside of the Proposed Development would be well diluted.

Chapter 10 (Marine Mammals and Basking Shark) of the ES Volume 1 (document reference 6.1.10)

<p>Displacement of marine mammals resulting in increased predation on benthic flora/fauna in areas outside of the Proposed Development</p>	<p>Benthic habitats, flora and fauna.</p>	<p>Marine mammals displaced during works could result in an increase in predation pressure on benthic organisms outside of the Proposed Development.</p>	<p>No.</p>	<p>Marine mammals may be displaced by construction and decommissioning activities (and during unforeseen repair and maintenance) through noise and vibration etc. However, densities of marine mammals found within the Channel are low and the effects from these impacts are considered to be temporary and short in duration. In addition, the area of displacement is smaller than the large foraging ranges of marine mammals suggesting that any increase in predation of benthic receptors outside of the Proposed development is unlikely to be measurable.</p>
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Chapter 11 (Marine Ornithology) of the ES Volume 1 (document reference 6.1.11)

<p>Displacement/disturbance of marine birds from noise and vessel movements resulting in increased predation on benthic flora/fauna in</p>	<p>Benthic habitats, flora and fauna.</p>	<p>Marine birds displaced during works could result in an increase in predation pressure on benthic organisms outside</p>	<p>No.</p>	<p>Marine birds may be displaced by construction and decommissioning activities (and during unforeseen repair and maintenance) through auditory and visual stimuli, and increases in SSC, associated with</p>
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<p>areas outside of the Proposed Development</p>		<p>of the Proposed Development.</p>		<p>construction and maintenance activities. However, the effects from these impacts are considered to be temporary and short in duration. In addition, the area of potential displacement is smaller than the large foraging ranges of marine birds suggesting that any increase in predation of benthic receptors outside of the Proposed development is unlikely to be measurable.</p>
<p>Chapter 12 (Commercial Fisheries) of the ES Volume 1 (document reference 6.1.12)</p>				
<p>Displacement of commercial fishing vessels resulting in increased damage to benthic flora/fauna from fishing activity in areas outside of the Proposed Development</p>	<p>Benthic habitats, flora and fauna.</p>	<p>Displaced fishing vessels during works could result in an increase in fishing pressure in other areas and result in damage to benthic communities outside of the Proposed Development.</p>	<p>No.</p>	<p>Temporary loss or restricted access to fishing grounds during construction and decommissioning activities (and during unforeseen repair and maintenance) may lead to the displacement of fishing activities into other areas. This could then lead to increased fishing effort in other areas, potentially resulting in increased damage to benthic habitats as a result of fishing activity in these areas. Section 12.6.2 assesses the impacts of</p>

				<p>temporary loss and restricted access to fishing grounds. The areas from where fishing effort will be displaced will be in place during seabed preparation and construction activities only represents a relatively small proportion of fishing ground available and will only be temporary. Therefore, impacts on benthic communities resulting from displacement of fishing vessels is considered to be well diluted.</p>
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When considered alongside the outcomes of the residual effects identified within Table 8.7 in Chapter 8 (Intertidal and Benthic Habitats), the interrelationship of effects on benthic habitats, flora and fauna identified above would not result in an additive or synergistic effect that would alter the conclusions made in Chapter 8 (Intertidal and Benthic Habitats).

Table 3 -- Chapter 9 (Fish and Shellfish)

Potential interrelated impacts by chapter	Receptor/s	Interrelationship	Assessment of interrelationship in Chapter 9?	Assessment description
Chapter 6 (Physical Processes)				
Changes in the hydrodynamic regime	Fish and Shellfish	Changes in the hydrodynamic regime (including scour) could change the composition of benthic communities there by reducing the availability of feeding opportunities for fish and shellfish.	No.	Chapter 6 (Physical Processes) describes that the permanent changes to the wave and tidal patterns will be negligible as a result of the Proposed Development. The changes to benthic communities as a result of physical disturbance or loss of habitat are described in Chapter 8 (Intertidal and Benthic Habitats) (see Section 8.6.4) and considered in Table 2. As any changes to wave and tidal patterns have been assessed to be negligible, and there are unlikely to be any significant effects on benthic communities from physical disturbance/habitat loss, minimal impacts to fish and shellfish as a result of this interrelationship are expected.

<p>Increased SSC and sediment deposition (smothering)</p>	<p>Fish and Shellfish</p>	<p>Suspended sediments and sediment deposition may have direct impacts on shellfish (smothering), and indirect effects could reduce the availability of food for fish and shellfish. Suspended sediments may act as a barrier to migration for spawning.</p>	<p>Yes.</p>	<p>See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Effects are considered to be not significant.</p>
<p>Chapter 7 (Marine Water and Sediment Quality)</p>				
<p>Mobilisation of contaminated sediments</p>	<p>Fish and Shellfish</p>	<p>Mobilisation of contaminants may cause a direct toxic effect on fish and shellfish.</p>	<p>No.</p>	<p>Samples of sediment tested demonstrated only two samples for Arsenic over Cefas Level 1. Assessment provided in Chapter 7 (Marine Water and Sediment Quality) and Appendix 7.3 (Contaminated Sediments Survey Report) suggest that any release of contaminants due to sediment disturbance would be</p>

				very low. Therefore, it is unlikely to result in impacts on fish or shellfish receptors.
Accidental spills	Fish and Shellfish	Pollution may cause direct impacts on individual fish and shellfish or reduce the amount of prey available through morbidity or mortality of individual prey animals.	No.	The potential for pollution events to occur is unlikely due to standard best practice pollution control measures.
Chapter 8 (Intertidal and Benthic Habitats)				
Temporary and permanent habitat loss.	Fish and Shellfish	Loss or disturbance of habitat may reduce availability of benthic organisms on which fish and shellfish feed.	Yes.	See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Effects are considered to be not significant.
Increased SSC and sediment deposition (smothering)	Fish and Shellfish	Suspended sediments could reduce the availability of	Yes.	See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Effects are considered to be not significant.

		benthic organisms through damage to feeding or smothering of shellfish. This, in turn, could reduce food availability for fish.		
Chapter 10 (Marine Mammals and Basking Sharks)				
Displacement of marine mammals resulting in increased predation on benthic flora/fauna in areas outside of the Proposed Development	Fish and Shellfish	Marine mammals displaced during works could result in an increase in predation pressure on fish and shellfish outside of the Proposed Development.	No.	Marine mammals may be displaced by construction and decommissioning activities (and during unforeseen repair and maintenance) through noise and vibration, increase in SSC etc. However, densities of marine mammals found within the Channel are low and the effects from these impacts are considered to be temporary and short in duration. In addition, the area of displacement is smaller than the large foraging ranges of marine mammals suggesting that any increase in predation of fish and shellfish outside of the Proposed development is unlikely to be measurable.

Chapter 11 (Marine Ornithology)				
Displacement/disturbance of marine birds from noise and vessel movements resulting in increased predation on benthic flora/fauna in areas outside of the Proposed Development	Fish and Shellfish	Marine birds displaced during works could result in an increase in predation pressure on fish and shellfish outside of the Proposed Development.	No.	Marine birds may be displaced by construction and decommissioning activities (and during unforeseen repair and maintenance) through auditory and visual stimuli, and increases in SSC, associated with construction and maintenance activities, However, the effects from these impacts are considered to be temporary and short in duration. In addition, the area of potential displacement is smaller than the large foraging ranges of marine birds suggesting that any increase in predation of fish and shellfish receptors outside of the Proposed development is unlikely to be measurable.
Chapter 12 (Commercial Fisheries)				
Displacement of commercial fishing vessels resulting in increased fish and	Fish and Shellfish	Displace fishing vessels during works could result in an increase in	No.	Temporary loss or restricted access to fishing grounds during construction and decommissioning activities (and

<p>shellfish takes from other fishing areas outside of the Proposed Development</p>		<p>fishing pressure in other areas.</p>		<p>during unforeseen repair and maintenance) may lead to the displacement of fishing activities into other areas. This could then lead to increased fishing effort in other areas, potentially resulting in increased fishing activity in these areas. Section 12.6.2 assesses the impacts of temporary loss and restricted access to fishing grounds. The areas from where fishing effort will be displaced during seabed preparation and construction activities only represents a relatively small proportion of fishing ground available and will only be temporary. Therefore, impacts on fish and shellfish resulting from displacement of fishing vessels is considered to be well diluted.</p>
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When considered alongside the outcomes of the residual effects identified within Table 9.13 in Chapter 9 (Fish and Shellfish), the interrelationship of effects on fish and shellfish identified above are not considered to result in an additive or synergistic effect that would alter the conclusions made in Chapter 9 (Fish and Shellfish).

Table 4 – Chapter 10 (Marine Mammals)

Potential interrelated impacts by chapter	Receptor/s	Interrelationship	Assessment of interrelationship in Chapter 10?	Assessment description
Chapter 6 (Physical Processes)				
Changes in the hydrodynamic regime	Marine mammals	Changes in the hydrodynamic regime (including scour) could change the composition of benthic communities which may reduce foraging habitat for fish and shellfish species. This may in turn reduce prey availability for marine mammals.	No.	Chapter 6 (Physical Processes) describes that the permanent changes to the wave and tidal patterns will be negligible as a result of the Proposed Development. The changes to benthic communities and fish and shellfish as a result of disturbance or loss of habitat are described in Chapter 8 (Intertidal and Benthic Habitats) (see Section 8.6.4) and Chapter 9 (Fish and Shellfish) and considered in Tables 2 and 3. As any changes to wave and tidal patterns have been assessed to be negligible, there are unlikely to be any significant effects on benthic communities or fish and shellfish, and therefore minimal impacts to marine mammals as a result of this interrelationship are expected. Furthermore, the foraging area for

				marine mammals is very large, and as such, any effects will only be present in a very small proportion of the foraging areas.
Increased SSC and sediment deposition (smothering)	Marine mammals	Suspended sediments and sediment deposition may have direct impacts on benthic organisms, sessile fish and shellfish species (smothering), and indirect effects could reduce the availability of food for marine mammals.	No.	Cetaceans use echolocation, rather than visual cues to hunt, and seals are sensitive to hydrodynamic stimuli through their whiskers rather than relying solely on sight and sound (Dehnhardt <i>et al.</i> , 1998; 2001). It is expected that marine mammals will continue to forage in areas of high sediment load, relying on sensory cues other than visual ones. It is also predicted that increases in SSC as a result of the Proposed Development will reduce down to background levels within a few days so any effects would only be short term and temporary. Furthermore, because marine mammals range widely and forage in a variety of habitats, any short-term local level changes in prey availability/quality are unlikely to result in a reduction in fitness or breeding success. Chapter 8 (Intertidal and Benthic Habitats)

				(see Section 8.6.4) and Chapter 9 (Fish and Shellfish) demonstrate that effects from increased SSC and sediment deposition on benthic communities or fish and shellfish are not significant. Therefore, there are unlikely to be any indirect impacts to marine mammals as a result of this interrelationship.
Chapter 7 (Marine Water and Sediment Quality)				
Mobilisation of contaminated sediments	Marine Mammals	Mobilisation of contaminants may cause a direct toxic effect on fish and shellfish that marine mammals predate upon. Contaminants can bioaccumulate in marine mammals through the food chain.	No.	Samples of sediment tested demonstrated only two samples for Arsenic over Cefas Level 1. Assessment provided in Chapter 7 (Marine Water and Sediment Quality) and Appendix 7.3 (Contaminated Sediments Survey Report) suggest that any release of contaminants due to sediment disturbance would be unlikely and very low. Therefore, impacts on marine species that could lead to an accumulation of contaminants within marine mammals are unlikely.
Accidental spills	Marine Mammals	Pollution may cause direct	No.	The potential for pollution events to occur is unlikely due to standard

		impacts on individual marine mammals or reduce the amount of prey available through morbidity or mortality of individual prey animals.		best practice pollution control measures.
Chapter 8 (Intertidal and Benthic Habitats)				
Temporary and permanent habitat loss.	Marine Mammals	Loss or disturbance of habitat may reduce availability of benthic organisms on which marine mammals or their prey may feed.	No.	Habitat disturbance will be short term and localised and although repeated disturbance is likely due to the sequential nature of works, recovery of communities is considered to be rapid in the majority of cases. Habitat loss will be confined to localised areas within the Proposed Development. Permanent loss of habitat is small in extent and will not lead to the loss of habitats within the local or regional setting. Chapter 8 (Intertidal and Benthic Habitats) (see Section 8.6.4) and Chapter 9 (Fish and Shellfish) demonstrate that effects from habitat disturbance or loss on benthic communities or fish and shellfish

				are not significant. Therefore, there are unlikely to be any indirect impacts to marine mammals as a result of this interrelationship.
Chapter 9 (Fish and Shellfish)				
Temporary and permanent habitat loss.	Marine Mammals	Loss or disturbance of habitat may reduce availability of fish and shellfish on which marine mammals feed.	No.	Habitat loss will be confined to localised areas within the Proposed Development. Any fish or shellfish receptors, within the area of the Proposed Development, which are susceptible to loss of habitat (substrate spawners, those that live on sediment), are mobile species which have large areas of alternative habitat widely available within proximity to the Proposed Development or within the Channel. Chapter 9 (Fish and Shellfish) demonstrates that effects from habitat disturbance or loss on fish and shellfish are not significant. Therefore, there are unlikely to be any indirect impacts to marine mammals as a result of this interrelationship.
Noise and vibration.	Marine Mammals	Fish could be displaced from the	No.	See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Noise will be

		Proposed Development due to noise and vibration. This could reduce the amount of prey available to marine mammals.		confined to localised areas within the Proposed Development. Any fish or shellfish receptors susceptible to noise are mobile species and noise will be continuous (not percussive) and will be of low intensity and short duration. Therefore, there are unlikely to be any indirect impacts to marine mammals as a result of this interrelationship.
Chapter 12 (Commercial Fisheries)				
Displacement of commercial fishing vessels resulting in increased fish and shellfish takes from other fishing areas outside of the Proposed Development.	Marine mammals	Displaced fishing vessels may enter areas that are not usually fished or increase fishing effort in other areas. This increased fishing effort may reduce the volume of prey available in these areas to marine mammals.	No.	Temporary loss or restricted access to fishing grounds during construction activities may lead to the displacement of fishing activities into other areas. This could then lead to increased fishing effort in other areas, potentially resulting in increased fishing activity in these areas which may lead to a reduction in prey availability for marine mammals or increased vessel traffic which may lead to avoidance of areas by marine mammal species. Section 12.6.2 assesses the impacts of temporary loss and restricted

				<p>access to fishing grounds. The areas from where fishing effort will be displaced during seabed preparation and construction activities only represents a relatively small proportion of fishing ground available and will only be temporary. Therefore, impacts on fish and shellfish and marine mammals resulting from displacement of fishing vessels is considered to be well diluted.</p>
<p>When considered alongside the outcomes of the residual effects identified within Table 10.10 in Chapter 10 (Marine Mammals and Basking Sharks), the interrelationship of effects on marine mammals and basking sharks identified above are not considered to result in an additive or synergistic effect that would alter the conclusions made in Chapter 10 (Marine Mammals and Basking Sharks).</p>				

Table 5 – Chapter 11 (Marine Ornithology)

Potential interrelated impacts by chapter	Receptor/s	Interrelationship	Assessment of interrelationship in Chapter 11?	Assessment description
Chapter 6 (Physical Processes)				
Changes in the hydrodynamic regime	Marine ornithology	Changes in the hydrodynamic regime (including scour) could change the composition of benthic communities which may reduce foraging habitat for fish and shellfish species. This may in turn reduce prey availability for birds.	No.	Chapter 6 (Physical Processes) describes that the permanent changes to the wave and tidal patterns will be negligible as a result of the Proposed Development. The changes to benthic communities as a result of disturbance or loss of habitat are considered in Chapter 8 (Intertidal and Benthic Habitats) (see Section 8.6.4) and Chapter 9 (Fish and Shellfish), in addition to Tables 2 and 3. As any changes to wave and tidal patterns have been assessed to be negligible, effects on benthic communities, fish and shellfish are also likely to be negligible, and therefore minimal impacts to marine birds are expected as a result of this interrelationship.

<p>Increased SSC and sediment deposition (smothering)</p>	<p>Marine ornithology</p>	<p>Suspended sediments and sediment deposition may have direct impacts on benthic organisms, sessile fish and shellfish species (smothering), and indirect effects could reduce the availability of food for marine birds.</p>	<p>Yes</p>	<p>See Section 11.6.2 of Chapter 11 (Marine Ornithology). The potential for effects of reduced prey availability and foraging success resulting from seabed disturbance and increased turbidity (and resulting sediment disposition) is considered to be short-term in duration and temporary, and therefore minimal impacts to marine birds are expected.</p>
<p>Chapter 7 (Marine Water and Sediment Quality)</p>				
<p>Mobilisation of contaminated sediments</p>	<p>Marine ornithology</p>	<p>Mobilisation of contaminants may cause a direct toxic effect on fish, shellfish and benthic species that marine birds predate upon. Contaminants can bioaccumulate in marine birds through the food chain.</p>	<p>No.</p>	<p>Samples of sediment tested demonstrated only two samples for Arsenic over Cefas Level 1. Assessment provided in Chapter 7 (Marine Water and Sediment Quality) and Appendix 7.3 (Contaminated Sediments Survey) Report suggest that any release of contaminants due to sediment disturbance would be unlikely and very low. As such, impacts on marine species that could lead to an accumulation of contaminants</p>

				within marine birds is considered unlikely.
Accidental spills	Marine ornithology	Pollution may cause direct impacts on individual marine birds or reduce the amount of prey available through morbidity or mortality of prey.	Yes.	See Section 11.6.2 of Chapter 11 (Marine Ornithology) for assessment of direct impacts. The potential for pollution events to occur is unlikely due to standard best practice pollution control measures.
Chapter 8 (Intertidal and Benthic Habitats)				
Temporary and permanent habitat loss.	Marine ornithology	Loss or disturbance of habitat may reduce availability of benthic organisms on which marine birds or their prey may feed.	Yes.	See Section 11.6.2 of Chapter 11 (Marine Ornithology) for assessment of indirect impacts on marine birds through loss and/or disturbance of benthic habitats. Chapter 8 (Intertidal and Benthic Habitats) (see Section 8.6.4) demonstrates that effects from habitat disturbance or loss on benthic communities are negligible. Therefore, there are unlikely to be any indirect impacts to marine birds as a result of this interrelationship.
Chapter 9 (Fish and Shellfish)				

<p>Temporary and permanent habitat loss</p>	<p>Marine Birds</p>	<p>Loss or disturbance of habitat may reduce availability of fish and shellfish on which marine birds predate upon.</p>	<p>Yes.</p>	<p>See Section 11.6.2 of Chapter 11 (Marine Ornithology) for assessment of indirect impacts on marine birds through loss and/or disturbance of habitats. Chapter 9 (Fish and Shellfish) demonstrates that effects from habitat disturbance or loss on fish and shellfish communities are negligible. Therefore, there are unlikely to be any indirect impacts to marine birds as a result of this interrelationship.</p>
<p>Noise and vibration</p>	<p>Marine Birds</p>	<p>Fish could be displaced from the Proposed Development due to noise and vibration. This could reduce the amount of prey available to marine birds.</p>	<p>No.</p>	<p>See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Noise will be confined to localised areas within the Proposed Development. Any fish or shellfish receptors susceptible to noise are mobile species. Noise will be continuous (not percussive) and will be of low intensity and short duration. Therefore, there are unlikely to be any indirect impacts to marine birds as a result of this interrelationship.</p>
<p>Chapter 12 (Commercial Fisheries)</p>				

<p>Displacement of commercial fishing vessels resulting in increased fish and shellfish takes from other fishing areas outside of the Proposed Development.</p>	<p>Marine ornithology</p>	<p>Displaced fishing vessels may enter areas that are not usually fished or increase fishing effort in other areas. This increased fishing effort may reduce the volume of prey available in these areas to marine birds as well as leading to increased levels of disturbance to marine birds from vessel movements.</p>	<p>No.</p>	<p>Temporary loss or restricted access to fishing grounds during construction activities may lead to the displacement of fishing activities into other areas. This could then lead to increased fishing effort in other areas, potentially resulting in increased fishing activity in these areas which may lead to a reduction in prey availability for marine birds, and increased levels of disturbance. Section 12.6.2 assesses the impacts of temporary loss and restricted access to fishing grounds. The areas from where fishing effort will be displaced during seabed preparation and construction activities only represents a relatively small proportion of fishing ground available and will only be temporary. Therefore, impacts on fish and shellfish and thus marine birds resulting from displacement of fishing vessels is considered to be well diluted.</p>
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When considered alongside the outcomes of the residual effects identified within Table 11.12 in Chapter 11 (Marine Ornithology), the interrelationship of effects on marine birds identified above are not considered to result in an additive or synergistic effect that would alter the conclusions made in Chapter 11 (Marine Ornithology).

Table 6 – Chapter 12 (Commercial Fisheries)

Potential interrelated impacts by chapter	Receptor/s	Interrelationship	Assessment of interrelationship in Chapter 12?	Assessment description
Chapter 6 (Physical Processes)				
Changes in the hydrodynamic regime	Commercial Fishermen	Changes in the hydrodynamic regime (including scour) could reduce the availability of feeding opportunities for fish and shellfish, which in turn could reduce catches.	No.	Chapter 6 (Physical Processes) describes that the permanent changes to the wave and tidal patterns will be negligible as a result of the Proposed Development. The changes to benthic communities as a result of physical disturbance or loss of habitat are described in Chapter 8 (Intertidal and Benthic Habitats) (see Section 8.6.4) and considered in Table 2. As any changes to wave and tidal patterns have been assessed to be negligible, and there are unlikely to be any significant effects on benthic communities from physical disturbance/habitat loss, minimal impacts to fish and shellfish and in turn, commercial fishermen as a result of this interrelationship are expected.

<p>Increased SSC and sediment deposition (smothering)</p>	<p>Commercial fishermen</p>	<p>Suspended sediments and sediment deposition may have direct impacts on shellfish (smothering), and indirect effects could reduce the availability of food for fish and shellfish, thereby affecting catch. Suspended sediments may act as a barrier to migration for spawning thereby affecting catches.</p>	<p>No.</p>	<p>See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Effects are considered to be not significant and therefore, impacts on commercial fishermen are expected to be minimal.</p>
<p>Chapter 7 (Marine Water and Sediment Quality)</p>				
<p>Mobilisation of contaminated sediments</p>	<p>Commercial fishermen</p>	<p>Mobilisation of contaminants may cause a direct toxic effect on fish and shellfish and result in reductions through morbidity or mortality,</p>	<p>No.</p>	<p>Samples of sediment tested demonstrated only two samples for Arsenic over Cefas Level 1. Assessment provided in Chapter 7 (Marine Water and Sediment and Quality) and Appendix 7.3 (Contaminated Sediments Survey Report) suggest that any release of</p>

		thereby reducing catches.		contaminants due to sediment disturbance would be very low. Therefore, it is unlikely to result in impacts on fish or shellfish receptors and in turn commercial fisheries.
Accidental spills	Commercial fishermen	Pollution may cause direct impacts on individual fish and shellfish through morbidity or mortality, thereby reducing catch.	No.	The potential for pollution events to occur is unlikely due to standard best practice pollution control measures.
Chapter 8 (Intertidal and Benthic Habitats)				
Temporary and permanent habitat loss.	Commercial fishermen	Loss or disturbance of habitat may reduce availability of benthic organisms on which fish feed which reduce the abundance of fish and shellfish in the area and subsequently reduced catch.	No.	Habitat disturbance will be short term and localised and although repeated disturbance is likely due to the sequential nature of works, recovery of communities is considered to be rapid in the majority of cases. Habitat loss will be confined to localised areas within the Proposed Development. Permanent loss of habitat is small in extent and will not lead to the loss of habitats within the local or regional setting. Chapter 8

				(Intertidal and Benthic Habitats) (see Section 8.6.4) and Chapter 9 (Fish and Shellfish) demonstrate that effects from habitat disturbance or loss on benthic communities or fish and shellfish are not significant. Therefore, there are unlikely to be any indirect impacts to commercial fisheries as a result of this interrelationship.
Chapter 9 (Fish and Shellfish)				
Temporary and permanent habitat loss.	Commercial fishermen	Loss or disturbance of habitat may reduce availability of fish, subsequently reducing catch.	No.	Habitat loss will be confined to localised areas within the Proposed Development. Any fish or shellfish receptors, within the area of the Proposed Development, which are susceptible to loss of habitat (substrate spawners, those that live on sediment), are mobile species which have large areas of alternative habitat widely available within proximity to the Proposed Development or within the Channel. Chapter 9 (Fish and Shellfish) demonstrates that effects from habitat disturbance or loss on fish and shellfish are not significant. Therefore, there are

				unlikely to be any indirect impacts to commercial fisheries as a result of this interrelationship
Noise.	Commercial fishermen	Fish could be displaced from the Proposed Development due to noise and vibration. This could reduce fish abundance in the area which may lead to reduced catch.	No.	See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Noise will be confined to localised areas within the Proposed Development. Any fish or shellfish receptors susceptible to noise are mobile species and noise will be continuous (not percussive) and will be of low intensity and short duration. Therefore, there are unlikely to be any indirect impacts to fish and shellfish and commercial fisheries as a result of this interrelationship.
Chapter 13 (Shipping, Navigation and Other Marine Users) of the ES Volume 1 (document reference 6.1.13)				
Navigation Risk	Commercial fishermen	Due to the presence of additional vessels undertaking works for the Proposed Development there may be increased risk of collision, navigational safety	No	Chapter 13 (Shipping, Navigation and Other Marine Users) assesses the potential effects of collision, disruption and navigational safety on fishing vessels. The assessment concluded that, with embedded and additional mitigation, the risk would be moderate and is considered tolerable.

	and disruption of fishing activities		
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When considered alongside the outcomes of the residual effects identified within Table 12.11 in Chapter 12 (Commercial Fisheries), the interrelationship of effects on commercial fisheries identified above are not considered to result in an additive or synergistic effect that would alter the conclusions made in Chapter 12 (Commercial Fisheries).

Table 7 – Chapter 13 (Shipping, Navigation and Other Marine Users)

Potential interrelated impacts by chapter	Receptor/s	Interrelationship	Assessment of interrelationship in Chapter 13?	Description
Chapter 6 (Physical Processes)				
Increased SSC and sediment deposition (smothering)	Recreational Anglers	Suspended sediments and sediment deposition may have direct impacts on shellfish (smothering), and indirect effects could reduce the availability of food for fish and shellfish. Suspended sediments may act as a barrier to migration for spawning.	No.	See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Effects from increased SSC and smothering are considered to be not significant and therefore, impacts on recreational anglers are expected to be minimal.
	Vessels	Sediment deposition may have direct impact on under keel clearance of vessels transiting in shallow waters.	No.	Section 13.6 in Chapter 13 (Shipping, Navigation and Other Marine Users) assesses the potential for vessel grounding as a result of reduced navigable depths. As part of the embedded mitigation and in line with requirements from Maritime and Coastguard Agency, all works will be planned so as not reduce existing water depths by more than 5 % along any section of the Marine Cable Corridor. This also applies to disposal of dredged material and

				any resulting sediment deposition resulting from this activity.
Chapter 9 (Fish and Shellfish)				
Temporary and permanent habitat loss.	Recreational Anglers	Loss or disturbance of habitat may reduce availability of fish, subsequently reducing catch.	No.	Habitat loss will be confined to localised areas within the Proposed Development. Any fish or shellfish receptors, within the area of the Proposed Development, which are susceptible to loss of habitat (substrate spawners, those that live on sediment), are mobile species which have large areas of alternative habitat widely available within proximity to the Proposed Development or within the Channel. Chapter 9 (Fish and Shellfish) demonstrates that effects from habitat disturbance or loss on fish and shellfish are not significant. Therefore, there are unlikely to be any indirect impacts to recreational anglers as a result of this interrelationship
Noise.	Recreational Anglers	Fish could be displaced from the Proposed Development due to noise and vibration. This could reduce fish abundance in the area which may lead to reduced catch.	No.	See Section 9.6.4 of Chapter 9 (Fish and Shellfish). Noise will be confined to localised areas within the Proposed Development. Any fish or shellfish receptors susceptible to noise are mobile species and noise will be continuous (not percussive) and will be of low intensity and short duration. Therefore, there are unlikely to be any indirect impacts to fish and shellfish and recreational angling as a result of this interrelationship.

When considered alongside the outcomes of the residual effects identified within Tables 13.8 and 13.9 in Chapter 13 (Shipping, Navigation and Other Marine Users), the interrelationship of effects on navigation and marine users identified above are not considered to result in an additive or synergistic effect that would alter the conclusions made in Chapter 13 (Shipping, Navigation and Other Marine Users).

Table 8 – Chapter 14 (Marine Archaeology)

Potential interrelated impacts by chapter	Receptor/s	Interrelationship	Assessment of interrelationship in Chapter 14?	Description
Chapter 6 (Physical Processes)				
Changes in the hydrodynamic regime	Marine archaeology features	Changes in the hydrodynamic regime (including scour) could increase exposure of archaeological assets and cause erosion and deterioration to assets.	Yes	See Section 14.6.4 of Chapter 14 (Marine Archaeology) of the ES Volume 1 (document reference 6.1.14). Effects are considered to be not significant.
Increased SSC leading to smothering	Marine archaeology features	Increased SSC as a result of dredging and cable installation activities may lead an increase in the release SSC which may lead to the risk of smothering potentially impacting archaeological features in the area of the Proposed Development.	Yes.	See Section 14.6.3 of Chapter 14 (Marine Archaeology). Effects are considered to be not significant.
The interrelationship of effects on marine archaeology identified above have already been assessed in Chapter 14 (Marine Archaeology).				

