LLŶR FLOATING OFFSHORE WIND PROJECT

Llŷr 1 Floating Offshore Windfarm

Environmental Statement

Volume 4: Chapter 31 – Inter-related Effects Assessment

August 2024

Prepared by: Llŷr Floating Wind Ltd

FLOVENTIS ENERGY

Document Status

Version	Authored by	Reviewed by	Approved by	Date
FINAL	AECOM	AECOM	AECOM	August 2024

Approval for Issue

Prepared by	AECOM
Prepared for	Llŷr Floating Wind Limited
Approved by	Jay Hilton-Miller

Acronyms and abbreviations

Acronym or abbreviation	Definition	Acronym or abbreviation	Definition
CEMP	Construction Environmental Management Plan	PCNP	Pembrokeshire Coast National Park
EIA	Environmental Impact Assessment	PEDW	Planning and Environmental Decisions Wales
EN-1	Overarching National Policy Statement for Energy	PINS	Planning Inspectorate
EN-3	National Policy Statement for Renewable Energy Infrastructure	PTS	Permanent Threshold Shift
ES	Environmental Statement	SAR	Search and Rescue
FLOW	Floating Offshore Wind	SLVIA	Seascape and Landscape Visual Impact Assessment
NPS	National Policy Statement	UXO	Unexploded Ordnance
NRW	Natural Resources Wales	WTG	Wind Turbine Generator

Glossary of project terms

Term	Definition
The Applicant	The developer of the Project, Llŷr Floating Wind Limited.
Array	All wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure within the Array Area, as defined, when considered collectively, excluding the offshore export cable(s).
Array Area	The area within which the wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure will be located.
Floventis Energy	A joint venture company between Cierco Ltd and SBM Offshore Ltd of which Llŷr Floating Wind Limited is a wholly owned subsidiary.
Landfall	The location where the offshore export cable(s) from the Array Area, as defined, are brought onshore and connected to the onshore export cables (as defined) via the transition joint bays (TJB).
Llŷr 1	The proposed Project, for which the Applicant is applying for Section 36 and Marine Licence consents. Including all offshore and onshore infrastructure and activities, and all project phases.
Marine Licence	A licence required under the Marine and Coastal Access Act 2009 for marine works which is administered by Natural Resources Wales (NRW) Marine Licensing Team (MLT) on behalf of the Welsh Ministers.
Offshore Development Area	The footprint of the offshore infrastructure and associated temporary works, comprised of the Array Area and the Offshore Export Cable

Term	Definition
	Corridor, as defined, that forms the offshore boundary for the S36 Consent and Marine Licence application.
Offshore Export Cable	The cable(s) that transmit electricity produced by the WTGs to landfall.
Offshore Export Cable Corridor (OfECC)	The area within which the offshore export cable circuit(s) will be located, from the Array Area to the Landfall.
Onshore Development Area	The footprint of the onshore infrastructure and associated temporary works, comprised of the Onshore Export Cable Corridor and the Onshore Substation, as defined, and including new access routes and visibility splays, that forms the onshore boundary for the planning application.
Onshore Export Cable(s)	The cable(s) that transmit electricity from the landfall to the onshore substation.
Onshore Export Cable Corridor (OnECC)	The area within which the onshore export cable circuit(s) will be located.
proposed Project	All aspects of the Llŷr development (i.e. the onshore and offshore components).
Onshore Substation	Located within the Onshore Development Area, converts high voltage generated electricity into low voltage electricity that can be used for the grid and domestic consumption.
Section 36 consent	Consent to construct and operate an offshore generating station, under Section 36 (S.36) of the Electricity Act 1989. This includes deemed planning permission for onshore works.

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31. INTER-RELATED EFFECTS ASSESSMENT

31.1. Introduction

1. Llŷr Floating Wind Limited (hereafter the Applicant) is proposing to develop the Llŷr 1 Floating Offshore Wind Farm (hereafter referred to as the proposed Project), located approximately 35 km off the coast of Pembrokeshire in the Celtic Sea.

2. The proposed Project is a test and demonstration wind farm development, comprising up to 10 wind turbine generators (WTGs). The proposed Project will make landfall at Freshwater West before connecting into Pembroke Dock power station and the national grid network.

3. This chapter of the Environmental Statement (ES) sets out the assessment of inter-related effects of the proposed Project during the construction, operation, and decommissioning phases. The general approach to the assessment is described in **Chapter 5: EIA Approaches and Methodologies, Section 5.8**, with further detail provided within this document, in **Section 31.4**.

4. As set out in PINS Advice Note 17 (PINS), 2019, *inter-related project effects*, or 'interrelationships between topics', derive from combinations of different project specific impacts which, when acting together on the same receptor, could result in a new or different effect, or an effect of greater significance than the project effects when considered in isolation.

5. The inter-related effects assessment for the proposed Project has been undertaken for each specialist topic and is described within the ES, **Chapters 7 to 28**. The approach to the inter-related effects assessment is presented in **Section 31.4** of this chapter with a summary of the results of the assessment undertaken presented in **Section 31.5.**

6. The assessment has been undertaken by AECOM. Further details of the proposed Project Team's competency are provided in **Appendix 1A: Statement of Competence**.

31.2. Legislation and Policy Context

31.2.1. Legislation

7. The proposed Project is seeking a Section 36 consent with deemed Planning Permission under the Electricity Act, 1989 from the Welsh Ministers, administered by Planning and Environment Decisions Wales (PEDW) who are authorised to undertake work in respect of these applications for the Welsh Ministers, and a Marine Licence under the Marine and Coastal Access Act, 2009 issued by Natural Resources Wales (NRW) Marine Licensing Team.

8. As discussed in **Chapter 2: Regulatory and Policy**, the proposed Project is required to undergo an Environmental Impact Assessment (EIA) in support of an application for Section 36 consent.

9. Regulation 39 of The Electricity Works (EIA) Regulations, 2017 permits the deferral of EIA considerations by one decision making authority to another where a separate consent (such as a marine licence) for which an EIA is required is also applied for. In accordance with Regulation 39(2) of the Electricity Works (EIA) (England and Wales) Regulations, 2017 the Welsh Ministers have considered and confirmed that; NRW will undertake an assessment of any significant effect of the environment under the Marine Works (EIA) Regulations, 2007; the marine works assessment will be sufficient to meet the requirements of the EIA Directive; and NRW will make the results of the marine works assessment available to the Welsh Ministers for the purposes of determining the applications under Section 36 of the Electricity Act 1989.

10. With regards to works where a marine licence is required, the EIA directive has been implemented in national legislation by the Marine Works (Environmental Impact

Assessment) Regulations, 2007 as amended by the Marine Works (Environmental Impact Assessment) (Amendment) Regulations, 2017. Schedule 3 of the Marine Works (EIA) Regulations 2009 sets out the information that must be included within the Environmental Statement (ES) which includes the requirement of Applicants to assess a project's potential for cumulative effects with other plans and projects. The 2017 amendment to the Regulations provides subsequent detail on the inclusion of interrelated effect assessment within an ES report.

31.2.2. Policy and Guidance

11. National Policy Statements (NPS) on Energy have been designated by the UK government to guide decision making on Nationally Significant Infrastructure Projects (NSIPs) consented under the Planning Act 2008. Given that the NPSs only applies to offshore wind projects that exceed 350 MW in capacity, they would not directly guide decision making on the proposed Project. However, because they were written to guide decision making on offshore wind projects, they are considered relevant as material considerations.

12. The Overarching National Policy Statement for Energy (EN-1), 2011, and the revised draft Overarching National Policy Statement for Energy (EN-1), 2023; set out the Governments objectives for the delivery of major infrastructure projects and are supported by technology specific National Policy Statements (NPSs) including NPS EN-3.

13. National Policy Statement for Renewable Energy Infrastructure (EN-3), 2011 and the revised draft National Policy Statement for Renewable Energy Infrastructure (EN-3), 2023 include general principles and policy on the assessment of impacts that should be applied in the assessment of development consent applications for all renewable energy projects. Paragraph 4.2.6 of NPS EN-1, 2011 (below) is relevant to this chapter and has been carried forward into Paragraph 4.2.19 of the revised draft NPS EN-1, 2023:

'The Infrastructure Planning Commission (IPC) [now the relevant Secretary of State (SoS)] should consider how the accumulation of, and interrelationship between, effects might affect the environment, economy and community as a whole, even though they may be acceptable when considered in an individual basis with mitigation measures in place.'

14. Section 2.6 of EN-3, 2011 refers to offshore wind projects and at Paragraph 2.6.19 details the role the Crown Estate has in issuing licences for development on the seabed, while Paragraph 2.6.35 states that,

'*there may be constraints imposed on the siting or design of offshore wind farms because of restrictions resulting from the presence of other offshore infrastructure or activities*.'

15. Revised draft NPS EN-3, 2023 includes reference to offshore wind at section 3.8, throughout which reference is made to the requirement of applicants to assess of cumulative or in-combination effects of impacts where there are other plans and projects permitted or in consideration. Paragraph 3.8.212 list of project specifies that:

'the scale and location of future offshore wind development around England and Wales means that development has occurred and will continue to occur, in or close to areas where there is other offshore infrastructure… the applicant should undertake an assessment of the potential effects of the proposed development on such existing or permitted infrastructure or activities.'

16. Additionally, PINS Advice Note 9 (Rochdale Envelope) (PINS, 2018) states:

'Ensure that the assessment of the worst-case scenario(s) address impacts which may not be significant on their own but could become significant when they inter-relate with other impacts alone or cumulatively with impacts from other development (including those identified in other aspect assessments).'

31.3. Consultation

17. Approach to inter-related effects been discussed by the Applicant, NRW and various statutory and non-statutory stakeholders during consultation for the EIA scoping report. Only two comments were received, regarding inter-related effects of shipping routes, during scoping (**Table** 31-1) and no further consultation was undertaken on this topic. The complete consultation process and associated responses are presented in **Chapter 6: Consultations and Stakeholder Engagement** and **Appendix 5C: Scoping Opinion Responses**.

Table 31-1. Consultation relating to inter-related effects

Consultee	Consultation type and date	Summary of comment raised	How issue has been addressed and location of response in chapter
Scoping			
Trinity House	Scoping Consultation (May 2022)	*A Navigation Risk Assessment forms part of the ES, and this includes comprehensive vessel traffic analysis in accordance with MGN 654, an assessment of **inter-related effects** on shipping routes and patterns and assessment of the potential 'corridor' between the array areas including future traffic patterns.*	Inter-related effects of shipping routes were assessed within ES **Chapter 24**: Shipping and Navigation.
Maritime and Coastguard Agency	Scoping Consultation (July 2022)	*Shipping to be included into the **in-combination effects** and shipping route proximity to the potential project site and other project sites.*	Inter-related effects of shipping routes were assessed within ES **Chapter 24**: Shipping and Navigation.

31.4. Assessment Methodology

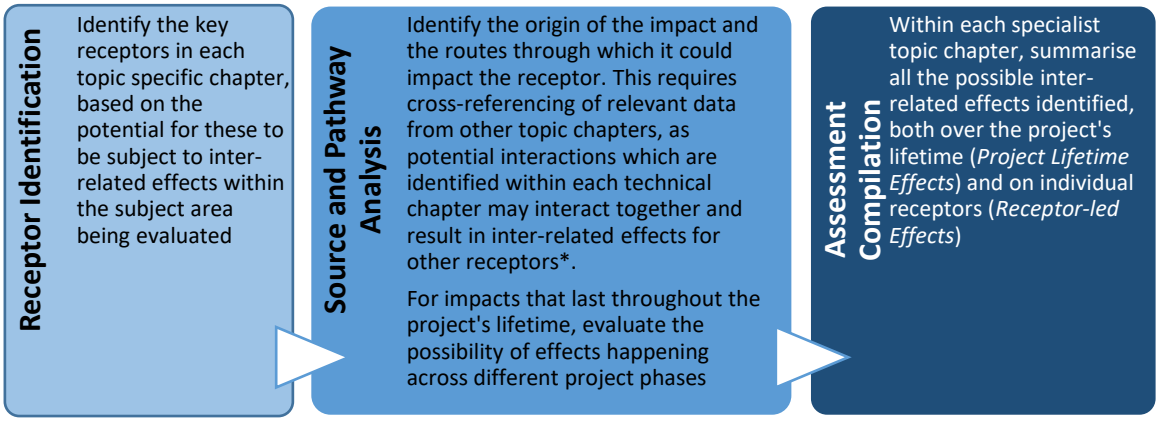
18. Inter-related project effects may occur wherever two or more impacts arising from the construction, operation and maintenance or decommissioning of a proposed development lead to effects which are inter-related via their impact pathways to a specific receptor or receptor group. The assessment of how individual impacts may combine to create inter-related effects on receptors (or receptor group) can be considered as either: 'project lifetime effects' (i.e. effects across multiple project phases); or 'receptor-led effects' (i.e. multiple effects on a single receptor).

19. For this assessment:

- Project Lifetime Effects are defined as effects that occur throughout more than one phase of the project and that interact to potentially create a more significant effect on a receptor or receptor group, than if only assessed in isolation in these three key project stages- i.e. construction phase, operation and maintenance phase, and decommissioning phase. For example: deterioration of water quality due to resuspension of sediments associated with project construction and operation activities, which may combine to create an additive effect of greater significance to the marine life; and
- Receptor-led Effects are defined as effects which spatially and temporally interact, to create inter-related effects on a receptor or receptor group. Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects. For example: the potential for spatial and temporal interactions between the effects arising from habitat loss / disturbance and from increase of suspended sediment concentration and / or sediment deposition during the project lifetime.

20. The assessment of inter-related project effects has been undertaken within each topic chapter using a combination of professional judgement and the significance criteria outlined in **Chapter 5: EIA Approaches and Methodologies, Table 5-6**.

21. The key stages in the approach to inter-related effects assessment are outlined below:



** For example, worsening of air quality and increased noise levels at a community facility could have negative implications for human health and socio-economics receptors*

22. The study area for inter-related effects is considered to be the maximum extent to which two (or more) impacts may give rise to an effect on a single receptor. In this case, the spatial extent of all impacts assessed within each topic chapter (described in **Chapters 7 to 28**) defines the study area, relevant to the respective receptor group. The spatial extent of these study areas is not consistent and varies in accordance with the topic and receptor assessed.

23. To identify where inter-related effects might occur, a comparison of the conclusions of each topic chapter was undertaken and is presented in **Section 31.5** below. It is highlighted that receptors assessed within each technical chapter are not the subject of identified interrelationships. For example, effects to human health inherently considers relationships between topics such as noise and vibration and air quality against established health standards. Hence, these threes topic areas are already assessed within the topic-specific chapters and have been scoped out. It is the inter-related impacts associated with other receptors during the construction, operation (including repair and maintenance) and decommissioning that have been considered.

31.5. Assessment of Inter-related Effects

24. The following includes a summary of the receptor-led and project lifetime inter-related effects assessments for each technical topic included within the ES.

31.5.1. Assessment Screening

25. Where a receptor has been identified as only experiencing one effect or where only one topic has identified effects on that receptor, there is no potential for inter-related effects. Therefore, these effects have been scoped out of the assessment. The list of technical topics excluded from the inter-related effects assessment is provided below in **Table 31-2**.

Table 31-2. Topics scoped out of the of inter-related effects assessment

Topic scoped out	Justification
Chapter 8: Terrestrial Ecology	The impacts and effects assessed inherently take into consideration potential inter-relationships between impacts and effects on terrestrial ecology and other topics assessed for this ES. These include **Chapter 7: Seascape, Landscape and Visual, Chapter 10: Water Environment, Chapter 12: Agriculture and Soils, Chapter 14: Air Quality** and **Chapter 15: Noise and Vibration.** As such Terrestrial Ecology has been scoped out of the inter-related effects assessment.
Chapter 9: Historic Environment and Cultural Heritage	Historic Environment and Cultural Heritage assessment considers the inter-relationship between cultural setting and visual impacts as assessed in **Chapter 7: Seascape, Landscape and Visual**. This forms an inherent part of the assessment, and therefore a further inter-related effects assessment is not required.
Chapter 11: Geology and Hydrogeology	The impacts set out and assessed in **Chapter 11: Geology and Hydrogeology** already consider potential inter-relationships between impacts on geology and hydrogeology and impacts on other topics as inherently connected. These topics include **Chapter 7: Seascape, Landscape and Visual, Chapter 8: Terrestrial Ecology, Chapter 10: Water Environment, Chapter 12: Agriculture and Soils, Chapter 14: Air Quality** and **Chapter 15: Noise and Vibration.**
Chapter 12: Agriculture and Soils	Both Agriculture and Soils as well as Geology and Hydrogeology (**Chapter 11: Geology and Hydrogeology**) consider effects arising from contamination. Despite this, no existing contaminated land sites have been identified within the Study Area for the onshore elements of the proposed Project. The assessment does not identify the potential for any contamination of land / soils arising from the construction, operation or decommissioning of the onshore elements of the proposed Project. Therefore, there is not considered to be any potential for inter-related effects for this receptor group.
Chapter 13: Traffic and Transport	Air quality (**Chapter 14: Air Quality**) along with noise and vibration (**Chapter 15: Noise and Vibration**) have potential inter-related

Topic scoped out	Justification
	effects with traffic and transport. However, both these topic chapters include consideration of the likelihood of air quality and noise effects associated with traffic and transport. Consequently, both noise and vibration as well as air quality are inherent to the traffic and transport effects assessment and these inter-related effects are already assessed and accounted for in the topic chapters.
Chapter 14: Air Quality	Dust emissions during the construction phase would only affect receptors at the time of release, which would not result in project lifetime effects or receptor led effects. Air Quality has been scoped out of the inter-related effects assessment.
Chapter 16: Socio-economics, Recreation and Tourism	Inter-relationships between these receptors have already been considered throughout the chapter, as the effects on socio-economic, recreation and tourism receptors are inherently related to the effects of other chapters assessed for this ES. This includes the assessments for **Chapter 13: Traffic and Transport, Chapter 15: Air Quality** and **Chapter 16: Noise and Vibration.** As such socio-economics, recreation and tourism have been scoped out of the inter-related effects assessment
Chapter 17: Physical Environment	The Physical Environment has been scoped out of the inter-related effects assessment. The reason for this is because the different marine and coastal processes studied are themselves inter-related and the information on changes to marine and coastal processes has been used to inform other EIA topics including **Chapter 18: Marine Seabed and Water Quality, Chapter 19: Benthic Ecology, Chapter 20: Fish & Shellfish Ecology, Chapter 21: Marine Mammals** and **Chapter 22: Ornithology.**
Chapter 26: Commercial Fisheries	In relation to proposed Project lifetime effects, the potential effects on commercial fisheries detailed in **Chapter 25: Commercial Fisheries, section 26.8** onwards, are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual project phase. In terms of receptor-led effects, inter-related effects on commercial fisheries are considered with respect to Fish and Shellfish Ecology (**Chapter 20: Fish and Shellfish**) and Shipping and Navigation (**Chapter 25: Shipping and Navigation**). The commercial fisheries assessment inherently considers impacts on fish resource through assessment of displacement or disruption to commercially important fish and shellfish receptors. The commercial fisheries assessment inherently considers impacts of proposed Project vessels interacting with fishing activity through assessment of

Topic scoped out	Justification
	increased vessel traffic leading to interference with fishing activity, drawing on the assessment in **Chapter 25: Shipping and Navigation**. Receptor-led effects on commercial fisheries are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented above. Consequently, inter-related effects for the Commercial Fisheries receptor group has been scoped out for this assessment.
Chapter 28: Other Sea Users	Other sea users have been scoped out of the inter-related effects assessment as no shared receptors have been identified within the other chapters within this ES. All impacts to other sea users (excluding shipping and navigation and commercial fisheries) are contained within **Chapter 28: Other Sea Users, section 28.8**. Therefore, inter-related effects related to other sea users and activities are scoped out of the inter-related effects assessment.

26. The assessment of inter-related effects therefore considers the following receptors:

- Landscape Visual Impact Assessment (**Chapter 7: Landscape and Visual Impact Assessment**)
- Marine Water and Sediment Quality (**Chapter 18: Marine Water and Sediment Quality**)
- Marine Mammals (**Chapter 21: Marine Mammals**)
- Seascape and Landscape Visual Impact Assessment (**Chapter 23: Seascape and Landscape Visual Impact Assessment**)
- Marine Archaeology (**Chapter 24: Marine Archaeology and Cultural Heritage**)
- Shipping and Navigation (**Chapter 25: Shipping and Navigation**)
- Aviation and Radar (**Chapter 27: Aviation and Radar**)

31.5.2. Inter-related Effects

27. **Table 31-3** and **Table 31-4** below identify instances when there is potential for inter-related effects to occur and considers whether any potential effects are already assessed within the individual topic chapters.

Table 31-3. Potential for receptor led effects

Specialist topic	Receptor led effect assessment
Seascape and Landscape Visual Impact Assessment	Potential receptor-led inter-related effects will be limited to a small number of landscape and visual receptors due to no or very limited and / or distant visibility of either the offshore or onshore elements of the proposed Project. During construction inter-related effects will be temporary in nature and of a short duration are only likely to occur at receptors where there will be direct or indirect change resulting from installation of the Offshore Export Cable and the Onshore Export Cable and Onshore Substation. During operation, locations with potential visibility of both the Onshore Substation and the proposed WTGs

Specialist topic	Receptor led effect assessment
	will largely be limited to localised parts of the top of the ridgelines between Carters Green and Corston Beacon / Corston Lodge and near Castlemartin. The limited nature of combined visibility reduces the potential for receptor-led inter-related effects.
Marine Mammals	Potential for spatial and temporal interactions between the benthic effects arising from habitat loss / disturbance and increases in suspended sediment concentration and sediment deposition and marine mammals during the project lifetime. Although to note this inter-related effect is not significant.
Marine Archaeology	Increased levels of scour or changing sediment dynamics resulting in the uncovering or burial of identified heritage assets during the construction and operational phases of the proposed Project. However, these effects are not significant.
Aviation and Radar	There is potential for spatial and temporal interactions between effects of the WTGs as physical obstructions to civil aircraft, military low flying aircraft, and SAR helicopter operations. The greatest potential for inter-related effects is predicted to occur through the interaction of civil aircraft, military low flying aircraft, and SAR helicopter operations in the area due to the addition of obstructions to be evaded and reduction in available airspace. With respect to this interaction, these individual impacts were assigned a significance of minor adverse as standalone impacts and although potential combined impacts may arise (i.e. spatial and temporal use of airspace around the Array Area), it is predicted that this will not be any more significant than the individual impacts in isolation.
Benthic Ecology	It is considered possible for spatial and temporal interactions to occur between the impacts identified for benthic ecology. The impacts were considered not significant as standalone, and although potential combined impacts may arise (i.e. spatial and temporal overlap of direct habitat disturbance from installation methods, sediment deposition and the presence of infrastructure), it is predicted that this will not be any more significant than the individual impacts in isolation. The combined area of habitat potentially affected would be very limited, and the scale and recoverability of the receptors (i.e. the biotopes affected are widespread) and where disturbance occurs, recovery of the benthos is predicted to occur in the short to medium term.
Fish and Shellfish	It is considered possible for spatial and temporal interactions to occur between the impacts identified for fish and shellfish. However, although these potential combined effects may arise

Specialist topic	Receptor led effect assessment
	(e.g. contaminants released in the same location as a pollution event occurring, or disturbance of seabed habitats where cables from two projects cross), it is predicted that this will not be more significant than the assessment of individual impacts when considered in isolation. This is due to the localised nature of the impacts, the combined area of habitat potentially affected would be very limited, and the scale and recoverability of the receptors (i.e. recovery of potential herring and sandeel spawning habitat following disturbance).

Table 31-4. Potential for Project lifetime effects

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
Landscape and Visual Impact Assessment	Construction, operation and decommissioning	Change to landscape character and views	Potential effects on landscape character across all phases of the proposed Project will be minor adverse or less. Construction and decommissioning stage effects will relate to installation of the Onshore Export Cable and construction (or decommissioning) of the Onshore Substation, with localised moderate adverse effects on a small number of visual receptors, with most receptors experiencing minor adverse effects. During operation potential effects on many receptors will be reduced, although moderate adverse effects will occur at two locations at year 1. The inclusion of mitigation measures will result in all effects reducing to minor adverse or less by year 15 of operation.	**Chapter 7: LVIA, section 7.12**
Marine Mammals	Construction, operation, and decommissioning	Disturbance arising from underwater noise	Most underwater noise associated with the proposed Project will occur from impact piling and UXO clearance activities in the pre-construction and construction phases only. Underwater noise from these activities	**Chapter 21: Marine Mammals Sections, 21.7,**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
			will be intermittent and temporary, and it is not anticipated that any disturbance or displacement effect will persist in the long-term because of these activities. Vessel disturbance (all project phases) has been assessed as not significant, localised, and temporary. Disturbance from operational noise has been assessed as highly localised and not significant. It is therefore considered that there is limited potential for an interaction during the construction, operation and decommissioning stages that would result in a greater effect than each stage assessment in isolation.	**21.8.1, 21.8.2 and 21.8.3**
		Impacts to prey species	Should prey availability or distribution be affected, during pre-construction, construction and decommissioning phases, marine mammals may have to forage different prey. However, marine mammals are highly mobile and wide-ranging and therefore, it is anticipated individuals would be able to forage in alternative areas, if required. All marine mammal species in this assessment are also considered to be generalist feeders, and thus are not dependent on a single prey species.	**Chapter 21: Marine Mammals Sections 21.8.2 and 21.8.3**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
			Therefore, it is likely that marine mammals can supplement their diet with other available species if required, making them resilient to changes in prey availability. It is unlikely that operation and maintenance activities will result in a negative impact on marine mammal prey species. The presence of FLOW structures could function as artificial reefs which may result in increased foraging opportunities. Therefore, no inter-related effect is anticipated.	
		Permanent Threshold Shift (PTS)	The risk of PTS-onset from pre-construction geophysical surveys, UXO clearance, impact piling, other construction activities (e.g. cable laying), vessel activity and operational noise have all been assessed as not significant independently. The commitment to apply appropriate mitigation further reduces this risk such that it is not anticipated these multiple activities over the various phases relating to the proposed Project will combine to an inter-related effect.	**Chapter 21: Marine Mammals Sections, 21.7, 21.8.1, 21.8.2 and 21.8.3**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
Marine Water and Sediment Quality	Construction, operation, and decommissioning	Deterioration of water quality due to changes in turbidity	The assessment concludes that these impacts across all phases of the proposed Project would be of minor to minor / negligible adverse significance, which is not significant in EIA terms. The majority of these impacts are predicted to occur as a result of interactions to marine physical processes (considered in **Chapter 17: Physical Environment**). As outlined in **Chapter 18: Marine Water and Sediment Quality**, **Section 18.7** standard control measures will be adhered to. In addition, the Project's CEMP and Water Quality and Pollution Management Plan will be adhered to. As a result, it is not expected that these impacts will result in inter-related effects of greater significance, through combined project phases, than those assessed in isolation.	**Chapter 17: Physical Environment** **Chapter 18: Marine Water and Sediment Quality, section 18.7**
		Deterioration of water quality due to release of contaminants		**Chapter 18: Marine Water and Sediment Quality, section 18.7**
		Deterioration of water quality due to drilling fluid release		**Chapter 18: Marine Water and Sediment Quality, section 18.7**
		Deterioration of water quality due to pollution events		**Chapter 18: Marine Water and Sediment Quality, section 18.7**
		Deterioration of water quality due to release of bacteria		**Chapter 18: Marine Water**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
				and Sediment Quality, section 18.7
Seascape and Landscape Visual Impact	Construction, operation and decommissioning	Change to seascape and landscape character and views	Potential effects on seascape and landscape character across all phases of the proposed Project will be minor adverse or less. Construction and decommissioning stage effects will largely relate to installation (or removal) of the offshore export cables and proposed WTGs, with limited influence on perceptual aspects of the PCNP and Heritage Coasts, SCAs and LCAs and on views resulting from increased movement of vessels at sea. During operation potential effects will relate to changes to perceptual characteristics of the PCNP and Heritage Coasts, SCAs and LCAs and to views resulting from visibility of the proposed WTGs. Effects will be limited by the considerable distance and intervening seascape between the proposed WTGs and receptors, and limited extent of views affected.	**Chapter 23: SLVIA, section 23.12**
Marine Archaeology	Construction and decommissioning	Direct, permanent loss of marine archaeological receptors.	Any direct impacts to marine archaeology and cultural heritage during the construction	**Chapter 24: Marine**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
			and installation phase of the project have the potential to be permanent and irreversible. Any direct impact upon a cultural heritage asset is therefore likely to have occurred during the construction phase. Indirect effects, primarily changes to the sediment regime resulting in enhanced exposure or burial of archaeological assets, are related to the activities which cause direct effects (i.e. they are caused, over the lifetime of the project, by installation of seabed infrastructure). Impacts from decommissioning are considered analogous to construction. Overall, no inter-related impacts have been identified that will result in a more significant, or additional effect on a receptor, than the impacts already discussed throughout these three key stages. Therefore, no further assessment of Project lifetime effects is considered necessary.	**archaeology and cultural heritage**
Shipping and Navigation	Construction, operation and decommissioning	Change to seascape and landscape character and views	Potential effects on seascape and landscape character across all phases of the proposed Project are present although will be not significant.	**Chapter 23: Seascape, Landscape and Visual Impact**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
			Construction and decommissioning stage effects will largely relate to installation (or removal) of the offshore export cables and proposed WTGs, with limited influence on perceptual aspects of the PCNP and Heritage Coasts, SCAs and LCAs and on views resulting from increased movement of vessels at sea. During operation potential effects will relate to changes to perceptual characteristics of the PCNP and Heritage Coasts, SCAs and LCAs and to views resulting from visibility of the proposed WTGs. Effects will be limited by the considerable distance and intervening seascape between the proposed WTGs and receptors, and limited extent of views affected.	**Assessment, section 23.8**
Benthic Ecology	Construction, Operation and Maintenance, and Decommissioning	Temporary physical disturbance to benthic habitats and species Direct permanent habitat loss	The assessment concludes that these impacts across all phases of the proposed Project would be of minor adverse significance, which is not significant in EIA terms. When habitat disturbance is considered additively across all three phases of development, the total area of habitat affected is larger than when considered in each phase individually. However, the	**Marine Water and Sediment Quality; ES Chapter 19: Benthic Ecology**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
			disturbance is taking place within the same site and therefore this spatial area represents repeated, rather than, additional disturbance. As a result, it is not expected that these impacts will result in inter-related effects of greater significance, through combined project phases, than those assessed in isolation.	
	Construction and Operation and Maintenance	Introduction or spread of marine Invasive and Non-Native Species (INNS)	The assessment concludes that these impacts across all phases were of negligible adverse significance, which is not significant in EIA terms. There is limited potential for inter-related effects to occur because of the presence of infrastructure and project vessels across the construction and operation phases, both due to the negligible significance associated with these impacts and the embedded mitigation and best practice measures in place (see **Appendix 04B - Invasive Non-Native Species Management Plan**). It is therefore not anticipated that there will be any inter-related effects of greater significance than those occurring in isolation.	**Marine Water and Sediment Quality;** **ES Chapter 19: Benthic Ecology**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
	Construction and Decommissioning	Increased SSC in subtidal habitats	The assessment concludes that these impacts across all phases of the proposed Project would be of minor adverse significance, which is not significant in EIA terms. Due to the very localised nature of the works which would occur predominantly in sand and gravel habitats, any physical disturbance to benthic habitats and species and local increases in SSC and sediment deposition will be short-term. Changes in water quality could occur during any development phase due to pollution events, but these would be unplanned and standard control measures will be adhered to, to minimise risk.	**Marine Water and Sediment Quality;** **ES Chapter 19: Benthic Ecology**
Fish and Shellfish	Construction, operation, and decommissioning	Indirect effects on prey resources	The impact assessment on benthic ecology has concluded that the proposed Project would not have a significant effect on this receptor, including permanent or temporary disturbance effects. Therefore, there is not considered to be indirect impacts such as a loss of prey items on fish and shellfish. Overall, the extent of the impact is local and minor in comparison	**Chapter 19: Benthic Ecology** **Chapter 21: Marine Mammals** **Chapter 22: Ornithology**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
			to the wide distribution and availability of suitable foraging grounds for fish. Similarly, the impact assessment for fish and shellfish, also concluded that there would not be a significant effect. Any effects would not have indirect effects to ornithology and marine mammals which rely on fish and shellfish as a prey item. There would not be population level effects to fish and shellfish and any changes would be highly localised and temporary. As a result, it is not expected that these impacts will result in inter-related effects of greater significance, through combined project phases, than those assessed in isolation.	
		Changes in water quality	Due to the very localised nature of the works which would occur predominantly in sand and gravel habitats, any physical disturbance to fish and shellfish habitats and species and local increases in SSC and sediment deposition will be short-term. Changes in water quality could occur during any development phase due to pollution events, but these would be unplanned and	**Chapter 18: Marine Water and Sediment Quality**

Specialist topic	Project Phase where effect expected	Nature of Inter-related Effect	Effects assessment	ES reference
			standard control measures will be adhered to, to minimise risk. As a result, it is not expected that these impacts will result in inter-related effects of greater significance to water quality as a whole, through combined project phases, than those assessed in isolation.	

31.6. Conclusion

28. This chapter has outlined the possible inter-related effects which may be caused by the proposed Project. This has allowed for an evaluation of how these impacts might affect different receptors. The evaluation was conducted using information detailed in the technical chapters of the ES in **Volume 2: Terrestrial Environment** and **Volume 3: Physical Environment**, with the identification of potential connected impacts relying on a qualitative assessment and professional judgement.

29. The assessment of inter-related impacts for the proposed Project has not revealed any significant effects beyond those already mentioned in the corresponding technical assessment chapters. Although some inter-related effects have been identified in this chapter, none are expected to result in effects of greater significance compared to those identified individually.

31.7. References

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