Hampshire Water Transfer and Water Recycling Project

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9 Marine biodiversity

9.1 Introduction

9.1.1 This document has been updated at Deadline 1 to correct the numbered references within the reference list. References to other Application documents have not been updated form the original submission. Please refer to the latest version of the Guide to Application (Document reference 1.3, DCO Volume 1) for the list of the current versions of documents.

9.1.2 This chapter provides the assessment of the likely significant effects on marine biodiversity from the construction, operation and decommissioning of the Hampshire Water Transfer and Water Recycling Project (hereafter referred to as the 'Proposed Development'), which is being progressed by Southern Water Services Limited ('the Applicant'). Marine biodiversity includes marine ecology (habitats and species) and fisheries (recreationally and commercially targeted species). Hereafter 'marine biodiversity' is used to refer to both marine ecology and fisheries together.

9.1.3 This chapter details the legislation, policy and guidance that is relevant to marine biodiversity, summarises the engagement and consultation undertaken to date, sets out the scope and methodology of assessment, and describes the baseline environment. Following this, the likely significant effects of the Proposed Development on marine biodiversity are assessed taking account of embedded primary and tertiary mitigation within the design. The need for any secondary mitigation is then considered along with any proposals for monitoring. The chapter concludes with a summary of residual effects.

9.1.4 Whilst this Environmental Statement (ES) presents as assessment of the effects that may occur from decommissioning activities of the Proposed Development, the Applicant is not seeking consent for decommissioning.

9.1.5 Marine biodiversity receptors considered within this chapter for the Proposed Development are:

1. Designated sites: including their associated designated interest features. Designated sites within the Zone of Influence (ZoI) (as defined in paragraph 9.5.13) are considered
2. Marine ecology comprising:
    a. Marine mammals: species that may occur within the ZoI for the Proposed Development are considered
    b. Fish: including fish spawning and nursery grounds within the ZoI for the Proposed Development
    c. Marine habitats: both intertidal and subtidal habitats within the ZoI for the Proposed Development are considered
    d. Benthic marine species: species within the ZoI for the Proposed Development are considered
3. Fisheries: recreationally and commercially targeted fish and shellfish species within the ZoI for the Proposed Development.

9.1.6 This chapter should be read in conjunction with ES Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6) which describes the development parameters against which the effects considered in this chapter have been assessed.

9.1.7 In addition, this chapter should be read alongside relevant parts of other chapters in Volume I, namely:

1. ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6) – assessment of the potential effects on birds that use the marine environment, which may be affected by construction works near the harbour, have been used to provide a estimation of the impacts to marine biodiversity (e.g. pollution spills, underwater noise and vibration) and this chapter cross references to Chapter 8, where necessary.
2. ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6) – predictions of sea level rise have been used to inform the future baseline for coastal habitats and marine environments, and this chapter cross references to Chapter 10, where necessary.
3. ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6) – assessment of the potential effects of landfill leachate on surface water and ecological habitats has been used to provide a complete assessment of the impacts to marine biodiversity and this chapter cross references to Chapter 11, where necessary.
4. ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6) – predictions of changes in the water environment in have been used to inform the assessment of the effects of water quality on the protected and designated species set out in this chapter, and this chapter cross references to Chapter 19, where necessary.
5. ES Chapter 20, Cumulative and in-combination effects, Volume I (Document reference 6.1, DCO Volume 6) – an assessment of the cumulative effects i.e. effects from the interrelationship between the Proposed Development and other developments, and an assessment of the in-combination effects i.e. effects from the interaction between the individual effects of the Proposed Development.

9.1.8 This chapter is informed by the following appendices, all contained in ES, Volume II (Document reference 6.1, DCO Volume 6):

1. ES Appendix 9.1 Designated sites identified within marine biodiversity study areas 1 and 2 (Document reference 6.2, DCO Volume 6)
2. ES Appendix 9.2 Migratory fish surveys (Document reference 6.2, DCO Volume 6)
3. ES Appendix 9.3 Intertidal seagrass survey (Document reference 6.2, DCO Volume 6)
4. ES Appendix 9.4 Intertidal survey results (Document reference 6.2, DCO Volume 6)
5. ES Appendix 9.5 Subtidal geophysical survey (Document reference 6.2, DCO Volume 6)
6. ES Appendix 9.6 Subtidal grab sampling report (Document reference 6.2, DCO Volume 6)

7. ES Appendix 9.7 Spatial distribution of fisheries effort (Document reference 6.2, DCO Volume 6)
8. ES Appendix 9.8 Ecology of fishery target species (Document reference 6.2, DCO Volume 6)
9. ES Appendix 9.9 Bivalve mollusc production area (Document reference 6.2, DCO Volume 6)
10. ES Appendix 9.10 Eastney Long Sea Outfall benthic ecology survey (Document reference 6.2, DCO Volume 6)
11. ES Appendix 9.11 Eastney Long Sea Outfall environmental DNA sampling and analysis (Document reference 6.2, DCO Volume 6)

9.2 Legislation, policy and guidance

9.2.1 This section identifies the legislation, policy, guidance and other documentation that has informed the assessment of likely significant effects on marine biodiversity.

Legislation

9.2.2 Table 9-1 lists the legislation relevant to the assessment of the likely significant effects on marine biodiversity.

Table 9-1 List of relevant legislation

Legislation	Relevance to assessment
Wildlife and Countryside Act 1981 [1]	This Act sets out legal protections for listed wild birds, animals and plant species and provides for the designation of Sites of Special Scientific Interest (SSSIs). The Proposed Development could impact protected species. This requires an assessment to understand the effects of the Proposed Development on protected species, so appropriate mitigation can be identified if necessary.
Natural Environment and Rural Communities (NERC) Act 2006 [2]	The NERC Act makes provision in relation to the conservation and enhancement of biodiversity and SSSIs. The NERC Act places a duty to conserve and enhance biodiversity on public authorities in England, and therefore this duty is applicable to the Applicant.
Marine and Coastal Access Act 2009 [3]	The Marine and Coastal Access Act makes provision in relation to marine functions and activities, marine planning and licensing, designation of Marine Conservation Zones (MCZs), fisheries, and migratory and freshwater fish. The Proposed Development could impact migratory fish and/or fish within fisheries.
The Marine Strategy Regulations 2010 [4]	The Marine Strategy Regulations implement the Marine Strategy Framework Directive (Directive 2008/56/EC) [5] and require action to be taken to achieve or maintain Good Environmental Status in the United Kingdom's seas by 2020. The Regulations

Legislation	Relevance to assessment
	require the production of a marine strategy for all UK waters, which has been developed as the UK Marine Strategy, as detailed in Table 9-2.
The Water Environment (Water Framework Directive (WFD)) (England and Wales) Regulations (WER) 2017 [6]	The WER sets out environmental objectives that all waterbodies must meet. The Proposed Development has the potential to impact on WFD waterbodies and shellfish water protected areas designated under the WER, such as Langstone Harbour. An assessment must be undertaken to establish whether a Proposed Development is likely to result in a failure to achieve these objectives in relation to a water body.
The Conservation of Offshore Marine Habitats and Species Regulations 2017 [7]	The Conservation of Offshore Marine Habitats and Species Regulations implement the species protection requirements of the Habitats Directive (Council Directive 92/43/EEC) [8] and the Wild Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds) [9] in the offshore area (over 12 nautical miles from the coastline, extending to the country's (i.e. England's) Exclusive Economic Zone (EEZ)). The Proposed Development could impact offshore marine habitats and species. This requires assessment to understand the potential effects of the Proposed Development on marine habitats and species of conservation importance and to mitigate any likely significant effect.
The Conservation of Habitats and Species Regulations 2017 [10]	The Conservation of Habitats and Species Regulations 2017 implement the requirements of the Habitats Directive in relation to the inshore marine area (up to 12 nautical miles from the coast). The overall objective of the Regulations is to ensure that species and habitat types protected under the legislation are maintained, or restored, to a favourable conservation status. The Proposed Development could impact habitats and species in the inshore marine area. This requires assessment to understand the potential effects of the Proposed Development on habitats and species of conservation importance covered by this legislation and to mitigate any likely significant effects.
Environment Act 2021 [11]	The Environment Act 2021 makes provision for targets, plans and policies aimed at improving the natural environment, including on water quality and biodiversity. The Proposed Development could impact water quality and biodiversity. This requires assessment to understand the potential effects of the Proposed Development.
The Environmental Targets (Marine Protected Areas) Regulations 2023 [12]	The Environmental Targets Regulations were made to set a long-term target in relation to MPAs, as required by the Environment Act 2021. They set out a long-term target of restoring 70% of protected features in all MPAs (i.e. marine Special Areas of Conservation (SACs), Special Protection Areas (SPAs), MCZs and Highly Protected Marine Areas (HPMAs)), to favourable condition by the end of 31 December 2042, with the rest of the protected features being in recovering condition.

Legislation	Relevance to assessment
	The Proposed Development could impact MPA (section 9.4 and section 9.8). This requires assessment to understand the potential effects of the Proposed Development.

National policy

9.2.3 The primary policy for determining the application for the Development Consent Order (DCO) for the Proposed Development is the National Policy Statement for water resources infrastructure (NPSWRI) [13]. This sets out policies to guide how DCO applications for water resources infrastructure should be decided and how the effects of such infrastructure are considered.

9.2.4 Table 9-2 lists the paragraphs from the NPSWRI and other national policy that are relevant to the marine biodiversity assessment. It also sets out where these policy requirements are addressed within the chapter.

Table 9-2 List of relevant national policy

Relevant paragraph reference	Summary of policy requirement	Where addressed in chapter
National Policy Statement for water resources infrastructure 2025 [13]		
Environmental Net Gain (ENG): Paragraphs 3.4.1 – 3.4.4	These paragraphs set out the requirement that projects should consider and seek to incorporate improvements in natural capital, ecosystem services and the benefits they deliver when planning how to deliver biodiversity net gain. They provide that developments may also deliver wider ENG relevant to the local area and to national policy priorities. Applications for development consent should be accompanied by a statement demonstrating how opportunities for delivering ENG have been considered and, where appropriate, incorporated into the design of the project. An example of ENG is an improvement to water quality.	Opportunities considered for delivering ENG as part of the Proposed Development are reported in the Environmental Net Gain (ENG) Statement which is submitted with the DCO application (Document reference 7.12, DCO Volume 7).
Biodiversity and nature conservation: Paragraphs 4.3.5 – 4.3.7, 4.3.13 – 4.3.17 and 4.3.19 - 4.3.23	These paragraphs set out the need to consider the full range of potential impacts of the Proposed Development, include appropriate mitigation measures that will seek to reduce works areas, reduce disturbance, and to clearly set out any likely significant effects on designated sites, protected species and habitats, regional and local sites, irreplaceable habitats and other habitats and species within	Section 9.4 Primary and tertiary mitigation – sets out primary and tertiary mitigation measures that have been embedded in the Proposed Development design. Section 9.8 Assessment of likely significant effects – all those parts of the Proposed Development below the Mean High Water Springs (MHWS)

Relevant paragraph reference	Summary of policy requirement	Where addressed in chapter
	the assessment, including consideration of MCZs. Development should contribute to and enhance the natural environment by providing net gains for biodiversity.	have been considered for any likely significant effects on marine designated sites, protected species and other marine habitats and species. Section 9.9 Mitigation and monitoring – monitoring of water quality is considered.
Coastal change: Paragraphs 4.5.1 – 4.5.14	These paragraphs set out the need to consider direct and indirect effects on coastline, seabed, marine ecology and biodiversity, and the historic environment from the construction of water resources infrastructure on the coast. This includes effects from construction of discharge outfalls and abstraction points, dredging, flood and coastal protection measures, effluent discharge from desalination process, and hydrodynamic response to direct changes that could lead to coastal erosion and changes to offshore features. These paragraphs set out the need to consider potential impacts from climate change using the latest set of UK Climate Projections.	All those parts of the Proposed Development below the MHWS have been considered for any effects on the coastline, seabed and marine biodiversity. However, the Proposed Development does not involve any physical changes to the coastline [14] or seabed or dredging or disposal into the sea. The construction of the Sustainable Drainage System (SuDS) outfall may require a temporary sheet pile, however the assessment (section 9.8) does not consider there to be potential effects on coastal processes or the seabed. Section 9.3 - Consultation, scoping and engagement - Effects on coastal processes were agreed to be scoped out of assessment in the Environmental Impact Assessment (EIA) Scoping Opinion (ES Appendix 5.1, Volume II (Document reference 6.2, DCO Volume 6)) and this ES only considered effects on marine biodiversity.
National Planning Policy Framework [2024] [15]		
Chapter 15: Conserving and enhancing the natural environment Paragraphs 187 – 195	The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how they are expected to be applied. Paragraphs 187 to 195 are under Chapter 15 Conserving and enhancing the natural environment. This Chapter sets out the requirement for planning decisions to contribute to and enhance the natural and local	Section 9.8 Assessment of likely significant effects – all those parts of the Proposed Development below the MHWS have been considered for any adverse effects on marine environment.

Relevant paragraph reference	Summary of policy requirement	Where addressed in chapter
	environment. This is achieved by preventing new and existing development from either contributing to, being put at unacceptable risk from, or being adversely affected by significant harm to biodiversity, or that harm can be adequately mitigated or compensated. This includes minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures, as well as promoting the conservation, restoration, and enhancement of priority habitats ecological networks and the protection and recovery of priority species, and identifying and pursuing opportunities for securing measurable net gains for biodiversity.	
UK Marine Policy Statement [2011] [16]		
Chapter 2: Paragraph 2.1	This section of the Chapter outlines the vision for the marine environment. This is described as 'clean, healthy, safe, productive and biologically diverse oceans and seas'.	Section 9.4 Primary and tertiary mitigation – sets out the primary and tertiary mitigation measures embedded in the Proposed Development design such as pollution control measures, noise dampening technology, good construction site management practices, etc. for minimising construction effects on marine habitats and species. Section 9.7 Baseline conditions – baseline data has been gathered through benthic surveys around the Eastney Long Sea Outfall (LSO) to understand the marine habitats and species potentially affected. Section 9.8 Assessment of likely significant effects - all those parts of the Proposed Development below the MHWS have been considered for any effects on marine habitats and species. Potential impacts include
Chapter 2: Box 1	This section of the Chapter identifies the high level marine objectives to be: achieving a sustainable marine economy; ensuring a strong, healthy and just society; living within environmental limits; promoting good governance; and using sound science responsibly.	
Chapter 2: Paragraph 2.3.2	This section of the Chapter outlines high level principles for decision making on planning activities in the UK marine area.	
Chapter 2: Paragraph 2.4	This section of the Chapter outlines that the marine plan authority will need to consider benefits and adverse effects in marine planning that will depend on factors including the specific characteristics of the marine area affected, compatibility	

Relevant paragraph reference	Summary of policy requirement	Where addressed in chapter
	with other existing or planned activities, and the potential cumulative impact of activities.	pollution events, underwater noise and vibration impacts and changes in release of treated wastewater via Eastney LSO. Section 9.9 Mitigation, monitoring and enhancement - monitoring of water quality has been considered. The scale and extent of water quality changes in release of treated wastewater via Eastney LSO are assessed in ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6).
Chapter 2: Ecological and Chemical Water quality and resources Paragraphs 2.6.4.1 – 2.6.4.4	This section of the Chapter identifies potential adverse effects of developments and other activities on transitional waters, coastal waters and marine waters, and states that during construction, operation and decommissioning phases of developments, there can be increased demand for water, discharges to water and adverse ecological effects resulting from physical modifications to the water environment.	
UK Marine Strategy [2019] [17]		
Marine Strategy Part One: UK updated assessment and Good Environmental Status (October 2019) Part 1 Section 2.6 - Predominant pressures affecting the marine environment Section 3 - Current environmental status, new objectives for GES and new targets	• Section 2.6 of this part of the policy requires identification of predominant pressures and associated activities affecting the UK marine environment. Potential pressure of input of other substances on marine mammals, pressure of input of anthropogenic sound (impulsive, continuous) and changes to hydrological conditions (migration barriers freshwater-seawater) on fish are identified in the EIA Scoping Report as being applicable to the Proposed Development though not predominant. • Section 3 of this part of the policy sets out the consideration of current environmental status, new objectives for Good Environmental Status (GES) and new targets for a list of descriptors/ecosystem components: some of the descriptors/ecosystem components mentioned in this section are identified in the EIA Scoping Report as being relevant to the Proposed Development, including cetaceans, seals, fish, benthic	Section 9.4 Primary and tertiary mitigation – sets out primary and tertiary mitigation measures that have been embedded in the Proposed Development design such as pollution control measures, noise dampening technology, good construction site management practices, etc. Section 9.7 Baseline conditions - baseline data has been gathered through desk study and surveys around the Hermitage Stream, Langstone Harbour and Eastney LSO to understand the marine habitat and species potentially affected. Section 9.8 Assessment of likely significant effects - the Proposed Development has been considered for any likely significant effects on the marine environment. Potential impacts include pollution events, underwater noise and vibration impacts during construction and changes in release of treated wastewater via Eastney LSO during operation.

Relevant paragraph reference	Summary of policy requirement	Where addressed in chapter
	habitats, non-indigenous species and commercial fish.	Section 9.9 Mitigation, monitoring and enhancement - monitoring of water quality has been considered. The scale and extent of water quality changes in release of treated wastewater via Eastney LSO are assessed in ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6).
Marine strategy Part Two: UK updated monitoring programmes (October 2022) Section 2: Monitoring programmes used to assess Good Environmental Status (GES) Section 3: Monitoring programmes for prevailing conditions used to support the assessment of GES	This part of the policy requires collection of data to assess progress towards GES and sets out the monitoring programmes required to assess the status for descriptor and ecosystem components. Descriptors and ecosystem components that are relevant to the Proposed Development include: • Section 2 - Descriptors 1 and 4 Cetaceans • Section 2 - Descriptors 1 and 4 Seals • Section 2 - Descriptors 1 and 4 Birds • Section 2 - Descriptors 1 and 4 Fish • Section 2 - Descriptors 1 and 6 Benthic habitats • Section 2 - Descriptor 2 Non-indigenous species • Section 2 - Descriptor 3 commercial fish and shellfish • Section 2 - Descriptor 5 Eutrophication • Section 2 - Descriptor 8 contaminants • Section 2 - Descriptor 9 contaminants in seafood • Section 2 - Descriptor 11 Underwater noise • Section 3 – Descriptor 7 Hydrographical conditions	Section 9.7 Baseline conditions - baseline data has been gathered through benthic surveys around the Eastney LSO to understand the marine habitat and species potentially affected. Birds are assessed in ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6).

Relevant paragraph reference	Summary of policy requirement	Where addressed in chapter
	• Section 3 - Salinity baseline around the UK • Section 3, Turbidity baseline around the UK	
Marine strategy part three: 2025 UK programme of measures Section 2: Programme of measures used to achieve or maintain GES	This part of the policy sets out the measures required to achieve or maintain GES for UK seas and considers the measures that are required for each descriptor. Descriptors and ecosystem components that are relevant to the Proposed Development include: • Section 2 - 2.1 – Cetaceans • Section 2 - 2.2 – Seals • Section 2 - 2.4 – Fish • Section 2 - 2.5 – Pelagic habitats • Section 2 - 2.6 – Benthic habitats • Section 2 - 2.7 – Non-indigenous species • Section 2 - 2.8 – commercial fish and shellfish • Section 2 - 2.12 – contaminants • Section 2 - 2.13 – contaminants in seafood	Section 9.4 Primary and tertiary mitigation – sets out primary and tertiary mitigation measures that have been embedded in the Proposed Development design such as pollution control measures, noise dampening technology, good construction site management practices etc. Section 9.8 Assessment of likely significant effects - the Proposed Development has been considered for any likely significant effects on the marine environment. Potential impacts include pollution events, underwater noise and vibration impacts during construction and changes in release of treated wastewater via Eastney LSO during operation. Section 9.9 Mitigation, monitoring and enhancement - monitoring of water quality has been considered.
South Inshore and South Offshore Marine Plan (2018) [18]		
S-CO-1	This enables proposals to be spatially planned and make appropriate use of available space by minimising footprints. Those activities that can co-exist, should do so.	The Proposed Development falls within the south inshore marine plan area which includes area from the MHWS to 12nm. Section 9.4 Primary and tertiary mitigation – these policies have been accounted for through the primary mitigation for the Proposed Development to avoid impacts on marine footprints (such as the use of existing infrastructure and the design of the hard infrastructure comprised
S-MPA-1	This makes sure proposals take account of adverse impacts on individual MPA sites and the overall network, protecting important habitats, species and geological features, enabling the successful and continued management of these sites.	

Relevant paragraph reference	Summary of policy requirement	Where addressed in chapter
S-MPA-4	This makes sure proposals do not prevent the future inclusion of features which may be required to enhance network coherence. The focus of S-MPA-4 is on Features of Conservation Importance, priority habitats and species, and Annex 1 habitat.	in the SuDS outfall) and also through the tertiary mitigation by managing impacts through good construction practices.
S-UWN-2	This supports management of underwater noise requiring proposals to take appropriate noise reduction actions. S-UWN-2 enables clear and proportionate regulation to make sure marine activity respects environmental limits and protects biodiversity.	
S-WQ-1	This seeks to manage impacts on water quality, and the habitats and species which benefit water quality through the ecosystem service they provide.	
S-WQ-2	This supports activities that can deliver an improvement to water environment or enhance habitats and species which can be of benefit to water quality.	
S-BIO-1	This requires proposals to demonstrate that they will, in order of preference, avoid, reduce, and mitigate significant adverse impacts on natural habitat and species adaption, migration and connectivity.	
S-BIO-4	This requires proposals to demonstrate that they will avoid reducing the distribution and net extent of priority habitats.	

Local policy

9.2.5 The local policies listed in Table 9-3 are considered relevant to the assessment of the effects of the Proposed Development. While the Secretary of State (SoS) is required to determine an application for development consent in accordance with the NPSWRI, it may be that the SoS considers aspects of local policy to be matters that are important and relevant to the determination. In the event that there is any conflict between the local policy and the NPSWRI, the NPSWRI would prevail for the purposes of decision making given the national significance of the infrastructure.

9.2.6 Adopted and emerging development plan policies have been considered. Adopted and emerging planning policy that are relevant is included in Table 9-3.

Table 9-3 List of relevant local policy

Local planning authority	Relevant local policy	Relevance to assessment
New Forest District Council (Shoreline Management Plan (SMP) Lead Authority)	North Solent SMP – Policy Unit 5A19 Southmoor Lane to Farlington Marshes (East) [14] • The SMP for North Solent is mainly 'hold the line', especially around Langstone Harbour for the next 100 years. This means maintaining or upgrading protection from flooding or erosion by holding the shoreline in broadly the same position. • Where protection is currently provided by coastal defence structures or managed beaches, the intention is to retain a defence along approximately the current alignment. • Strategic objective 1.4: Between now and 2030 risk management authorities will use nature based solutions and improve the environment through their investments in flood and coastal resilience. • Strategic objective 2.2: Between now and 2030 risk management authorities will encourage environmental net gain in all new development to support resilience to flooding and coastal change. • Measure 2.2.2: From 2021 risk management authorities will work with developers and planners to maximise the opportunities for flood and coastal resilience as part of contributing to environmental net gain for development proposals.	These policies have been considered in the Future Baseline section of section 9.7 which sets out any expected changes of the harbour shoreline in the future without the impacts of the Proposed Development.
Chichester Harbour Conservancy (CHC)	Chichester Harbour Policies (in Chichester Harbour Management Plan 2024-2025 adopted on 29 January 2024) [19] • Policy 1 Conserving and Enhancing the Landscape	These plans set out the actions to be undertaken by CHC and stakeholders to ensure the conservation and enhancement of Chichester Harbour National Landscape (previously termed Area of

Local planning authority	Relevant local policy	Relevance to assessment
	• Policy 3 Diversity of Habitats • Policy 6 Water Quality • Policy 7 Catchment Sensitive Farming – this specific policy supports the reduction of nitrate vulnerable zones and aims to reduce the nutrient input into the Chichester Harbour. • Policy 8 Thriving Wildlife • Policy 12 Connecting People to Nature • Policy 13 Prosperous Economy – this policy aims to support commercial fisheries in the Chichester Harbour • Policy 14 Marine Litter Pollution Chichester Harbour National Landscape Management Plan (2025-2030) (Consultation Draft) [20] • Policy 1.4 Water Pollution • Policy 1.5 Compliance with UK Law • Policy 5.6 Major Developments	Outstanding Natural Beauty (AONB)) and these include requirements to: • Manage sources of water pollution • To sustainably manage and protect the nationally important landscape designation and promote biodiversity • Prevent disturbance to wildlife • Safeguard the natural environment for a positive relationship with people • Ensure working day practices do not degrade the area • Prevent marine litter from increasing These actions relevant to potential indirect effects have informed the tertiary mitigation set out in the Outline Construction Environmental Management Plan (CEMP) (Document reference 7.1, DCO Volume 7) and Operational Environmental Management Plan (OEMP) (Document reference 7.7, DCO Volume 7) for the Proposed Development.
East Hampshire District Council (EHDC)	East Hampshire District Local Plan: Joint Core Strategy (Adopted May 2014) [21]. Relevant Core Policies (CP) include: • CP21 Biodiversity • CP22 Internationally designated sites The Joint Core Strategy sets out requirements for development proposals to maintain, enhance and protect the district's biodiversity and its surrounding environment.	These policies have informed primary mitigation and have fed into the Design Principles Document (Document reference 5.11, DCO Volume 5) for the Proposed Development. This has also informed the BNG strategy and any relevant habitat mitigation.

Local planning authority	Relevant local policy	Relevance to assessment
	Draft East Hampshire District Council: Our Local Plan 2021-2040 (Emerging local plan January 2024) [22] • NBE2 Biodiversity, Geodiversity and Nature Conservation sets out requirements for development proposals to maintain, enhance and protect the district's biodiversity and its surrounding environment • NBE3 Biodiversity Net Gain requires developments to make a measurable BNG of at least 10% which is demonstrated and secured in perpetuity (for at least 30 years)	These policies have informed primary mitigation and have fed into the Proposed Development's Design Principles Document (Document reference 5.11, DCO Volume 5).
Eastleigh Borough Council (EBC)	Eastleigh Borough Local Plan 2016-2036 (Adopted April 2022) [23] • Strategic Policy S7 The Coast sets out protection of the coast and its inshore areas from development detrimental to their character. The Council seeks to protect and enhance the biodiversity interest of the coast including views from coastal waters, and to achieve coastal protection and flood management measures. • Policy DM10 Water and Wastewater sets out that where new water supply or wastewater infrastructure is required or proposed in support of new development, the development will be phased alongside the provision of the infrastructure to ensure compliance with the Habitats Regulations that there is no deterioration of the status of water bodies which might impact adversely on WFD requirements for example the Solent Maritime SAC and the avoidance or mitigation of any other adverse impacts. • Policy DM11 Nature conservation sets out that the Council will determine planning applications to protect, conserve and enhance all designated sites and networks of	The policies set out requirements for new water infrastructure to avoid adverse environmental impacts. They also define requirements for development proposals to consider designated sites, networks of natural habitats and features and provide a net gain in biodiversity. These policies have informed habitat mitigation and enhancement, presented in the ES, and have fed into the Design Principles Document (Document reference 5.11, DCO Volume 5).

Local planning authority	Relevant local policy	Relevance to assessment
	natural habitats and features, to assist in achieving biodiversity targets as set out in Biodiversity Action Plans, and to seek a net gain of biodiversity on all development sites.	
Fareham Borough Council (FBC)	Fareham Local Plan 2037 (Adopted April 2023) [24] • NE1 – Protection of Nature Conservation, Biodiversity and the Local Ecological Network details requirements for developments proposals with the borough to protect biodiversity. • NE2 – Biodiversity Net Gain requires development of one or more dwelling or a new commercial/leisure building to provide at least 10% net gains for biodiversity from the existing baseline value of the site and should be maintained for a minimum of 30 years.	These policies have fed into the mitigation and enhancement for habitats and European Protected Species (EPS), outlined in the ES, and have informed the Design Principles Document (Document reference 5.11, DCO Volume 5) and the Biodiversity Gain Plan (Document reference 7.11, DCO Volume 7).
Havant Borough Council (HBC)	Havant Borough Core Strategy (Adopted March 2011) [25] • DM8 – Conservation, Protection and Enhancement of Existing Natural Features sets out relevant criteria for developments to protect and enhance local habitats and landscape distinctiveness. • DM9 - Development in the coastal zone sets out the requirement to have no harmful effects on SSSIs and Local Nature Reserves (LNRs). • CS11 – Protecting and Enhancing the Special Environment and Heritage of Havant Borough sets out criteria for protecting and enhancing the Special Environment and Heritage of Havant Borough.	These policies have informed the Design Principles Document (Document reference 5.11, DCO Volume 5) and fed into the mitigation and enhancement presented in the ES, and the Biodiversity Gain Plan (Document reference 7.11, DCO Volume 7) for no harmful effects on nature conservation within the Chichester and Langstone Harbours SPA and Ramsar site, Solent Maritime SAC, Langstone Harbour SSSI, or any Sites of Importance for Nature Conservation or LNRs.
Portsmouth City Council (PCC)	Pre-Submission Portsmouth Local Plan (July 2024) [26] • Strategic Policy PLP39 – Biodiversity sets out requirements for development proposals to conserve and enhance the marine	This has fed into the Design Principles Document (Document reference 5.11, DCO Volume 5) and into the mitigation and enhancement presented in the ES.

Local planning authority	Relevant local policy	Relevance to assessment
	natural environment and safeguard the components of Portsmouth's ecological networks.	
	Development Management Policy PLP36: Coastal Zone • PH1 Portsmouth Harbour Coastal Zone • LH2 Langstone Harbour Coastal Zone These set out requirements for developments to prevent adverse effects on the harbours' coastal landscape, public access to waterfront, navigation within or nature conservation interests.	These have fed into the Design Principles Document (Document reference 5.11, DCO Volume 5) and into the mitigation and enhancement presented in the ES.

Guidance, standards and advice

9.2.7 In addition, the marine biodiversity assessment has been undertaken in accordance with relevant guidance and has been compiled in accordance with professional standards. The guidance and standards which relate to this assessment are detailed in Table 9-4.

Table 9-4 List of relevant guidance and standards

Guidance	Description	Relevance to assessment
JNCC (2004) The Marine Habitat Classification for Britain and Ireland [27]	The classification provides a tool to aid the management and conservation of marine habitats.	This guidance is relevant to the marine biodiversity assessment as benthic marine habitats are included within the assessment scope and this classification has been used to categorise or classify habitats.
JNCC (2019) Guidance on Assigning Benthic Biotopes using EUNIS or the Marine Habitat Classification of Britain and Ireland [28]	This document on biotopes provides a simplified description of the variation in biological community across a region, to make it easier to visualise patterns and see which areas are similar in character.	This guidance is relevant to the assignment of biotopes to survey data gathered.
Diver's Guide to Marine Life of Britain and Ireland [29]	This guideline introduces divers to the most common and identifiable animals and plants they will encounter underwater.	This guidance is relevant to the marine biodiversity assessment as it was used to identify general benthic species that may be found within the study areas.

Guidance	Description	Relevance to assessment
Marine Evidence-based Sensitivity Assessment (MarESA) – Guidance Manual [30]	This guideline details the approach of the MarESA methodology, its assumptions, and its application to sensitivity assessment.	This guideline is relevant to the marine biodiversity assessment as it was used to assess sensitivity of recorded species that may be affected by indirect water quality impacts of the Proposed Development.
Offshore Wind Farms: Guidance Note for Environmental Impact Assessment in Respect of Food and Environmental Protection Act (FEPA) and Coast Protection Act (CPA) Requirements: Section 6 – Commercial Fisheries [31]	This document provides scientific guidance for the gathering, interpretation and presentation of data within an EIA as part of the consents application process in England and Wales.	This guidance is relevant to the marine biodiversity assessment as data gathering and interpretation has been utilised to assess impacts.
Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine – Version 1.3 updated September 2024 [32]	These guidelines promote good practice in undertaking environmental reports.	The guidelines explain the key elements of the process and provides the criteria to be considered when undertaking an ecological assessment.

9.3 Consultation, scoping and engagement

Consultation

9.3.1 Feedback received from stakeholders for each consultation relevant to marine biodiversity is summarised within the Consultation Report (Document reference 5.1, DCO Volume 5) including how the Proposed Development has had regard to the feedback. These cover the consultation responses received for the following consultations:

1. Summer 2022 Consultation
2. Summer 2024 Consultation
3. Spring 2025 Consultation
4. Autumn 2025 Consultation
5. Spring 2026 Consultation

Environmental Impact Assessment scoping

9.3.2 An EIA Scoping Opinion was adopted by the Planning Inspectorate on behalf of the SoS on 31 August 2023. A full list of the EIA Scoping Opinion comments made by the Planning Inspectorate and a response to those comments are provided in

ES Appendix 5.3 Response to EIA Scoping Opinion, Volume II (Document reference 6.2, DCO Volume 6).

9.3.3 Comments received in relation to marine biodiversity are set out in Table 9-5, describing how and where these are addressed in the ES.

Table 9-5 Environmental Impact Assessment Scoping Opinion - Planning Inspectorate comments

Scoping Opinion ID	Summary of Scoping Opinion comment	How the ES addresses the Scoping Opinion comment	Where addressed in the ES
ID 3.4.1	The EIA Scoping Opinion does not consider that the Applicant has provided sufficient justification as to why sand eel surveys are not required. Surveys should be undertaken to inform the baseline description unless agreement is reached with relevant consultation bodies that these are not required. Evidence of this agreement should be provided in the ES.	Benthic visual surveys and eDNA sampling have been undertaken to inform baseline description using non-intrusive methods so that these data would support investigation of any presence of sand eel and suitable habitat for sand eel. The specifications of these surveys were discussed with the MMO, NE and the EA as part of the Technical Working Group (TWG) meetings in May, June, July, August, and September 2023 with specifications issued for their review in May 2023. Feedback on these survey specifications was received in March 2024 post survey completion, and this was acknowledged by the Applicant. The survey reports were reviewed by NE in October 2025 without comment. Additional desk study on sand eel habitat suitability was conducted and presented to NE, MMO and the EA as part of the TWG meeting on 22 January 2026 in which agreement was reached that sand eel surveys are not required. Nevertheless, a precautionary assessment approach is taken in the ES to assume the presence of sand eel and to assess potential effects on sand eel.	Section 9.7 Baseline conditions Section 9.8 Assessment of likely significant effects
ID 3.4.2	The EIA Scoping Opinion agreed that effects arising from the Pipeline between the Water Recycling Plant site and Otterbourne Water Supply Works) during construction and operation can be scoped out.	No additional information provided in the ES.	No additional information provided in the ES.

Scoping Opinion ID	Summary of Scoping Opinion comment	How the ES addresses the Scoping Opinion comment	Where addressed in the ES
ID 3.4.3	The EIA Scoping Opinion agreed that potential effects on marine ecology from the introduction of Invasive Non-Native Species (INNS) during construction and operation can be scoped out.	Works within the marine environment have been revisited due to the inclusion of a SuDS outfall in the design of the WRP site as part of the Proposed Development after the Scoping Opinion was issued. The SuDS outfall would be constructed in the tidal section of Hermitage Stream and would release surface water flow from the WRP site. There is now a potential pathway for INNS to enter the water column during construction and operation, therefore potential effects of introduction of INNS are now scoped in. Primary measures are considered in this chapter for the proposed SuDS outfall and tertiary measures on avoiding introduction of INNS are set out in the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7) and cross-referenced in this chapter.	Section 9.4 Primary and tertiary mitigation, section 9.5 Assessment methodology, section 9.8 Assessment of likely significant effects
ID 3.4.4	The EIA Scoping Opinion agreed that potential effects on marine mammals and fish from visual disturbance (human presence, vehicle movement and light pollution) during construction and operation can be scoped out. The EIA Scoping Opinion requested that information about external lighting to be included in the ES.	The addition of the SuDS has not required any change in the scope of assessment in relation to the potential effects on marine mammals and fish from visual disturbance. Measures on avoiding light pollution during construction are set out in the Outline CEMP (Document reference 7.1, DCO Volume 7) and cross-referenced in this chapter. Information about lighting design principles avoiding light impact during operation is included in the Design Principles Document (Document reference 5.11, DCO Volume 5) and cross-referenced in this chapter.	Section 9.4 Primary and tertiary mitigation
ID 3.4.5	The EIA Scoping Opinion requested that the ES should include an assessment of likely significant effects from temporary habitat loss arising	Pollution derived habitat loss is considered in the assessment as part of pollution events during construction for all marine biodiversity receptors.	Section 9.5 Assessment methodology, section 9.8 Assessment of

Scoping Opinion ID	Summary of Scoping Opinion comment	How the ES addresses the Scoping Opinion comment	Where addressed in the ES
	from pollution events during construction.	Measures on reducing pollution events during construction are set out in the Outline CEMP (Document reference 7.1, DCO Volume 7) and cross-referenced in this chapter. Works within the marine environment have been revisited in view of the WRP site SuDS outfall being incorporated into the Proposed Development after the EIA Scoping Opinion was issued. Given this change temporary habitat loss in the tidal section of Hermitage Stream is considered in the assessment in a worst case scenario as described in section 3.5 of ES Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6).	likely significant effects
ID 3.4.6	The EIA Scoping Opinion agreed that direct habitat loss during operation can be scoped out.	Works within the marine environment have been revisited in view of the WRP site SuDS outfall being incorporated into the Proposed Development after the EIA Scoping Opinion was issued. Potential direct habitat loss is therefore considered in the assessment. However, the walkover survey shows that habitat in the Hermitage Stream bank at the assumed location of SuDS outfall is a revetment (artificial hard structure). This is not a priority habitat but an artificial marine habitat which will be replaced by the SuDS outfall structure. The hard substrate communities currently on the existing structures will eventually colonise the new structures, creating a similar habitat. Therefore, no permanent marine habitat loss is anticipated.	Section 9.5 Assessment methodology, section 9.8 Assessment of likely significant effects
ID 3.4.7	The EIA Scoping Opinion agreed that underwater noise and vibration associated with construction of the Pipelines	No additional information provided in the ES.	No additional information provided in the ES.

Scoping Opinion ID	Summary of Scoping Opinion comment	How the ES addresses the Scoping Opinion comment	Where addressed in the ES
	between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site on marine habitats can be scoped out.		
ID 3.4.8	The EIA Scoping Opinion agreed that underwater noise and vibration from the Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site during operation can be scoped out.	No additional information provided in the ES.	No additional information provided in the ES.
ID 3.4.9	The EIA Scoping Opinion agreed that pollution events (from use of plant and machinery) during operation can be scoped out. The EIA Scoping Opinion requested description of management and control measures that would be in place to avoid potential pollution events within the ES.	Management and control measures during operation that would be in place to avoid potential pollution events are described in the OEMP (Document reference 7.7, DCO Volume 7).	Section 9.4 Primary and tertiary mitigation
ID 3.4.10	The EIA Scoping Opinion agreed that changes in effluent discharge from Eastney LSO during construction can be scoped out.	No additional information provided in the ES.	No additional information provided in the ES.
ID 3.4.11	The EIA Scoping Opinion requested consideration of potential effects on birds in the marine area which may be affected by construction works near the harbour.	For potential effects on marine birds, cross-references are provided to the appropriate sections in ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6) to avoid repetition.	ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6)
ID 3.4.12	The EIA Scoping Opinion requested confirmation of any designated sites with grey seal as a qualifying feature beyond the 30km Zone of Influence (ZoI) that could be affected by the Proposed Development.	The nearest SAC where grey seal is a qualifying feature, but not a primary reason for site selection, is the Isles of Scilly Complex SAC which is over 380km away. Typically, grey seal is reported to conduct mean round trips of 39.8km related to journeys returning back to the same haul-out locations [33], so their daily transit is likely to be less than 20km.	No additional information provided in the ES in relation to this matter.

Scoping Opinion ID	Summary of Scoping Opinion comment	How the ES addresses the Scoping Opinion comment	Where addressed in the ES
		Therefore, it is confirmed that no designated sites with grey seal as a qualifying feature beyond the 30km ZoI could be affected.	
ID 3.4.13	The EIA Scoping Opinion expressed that no description has been provided of the methods that will be used to assess impacts and whether these will be quantitative or qualitative. The Scoping Opinion requested that methodologies used for the assessments must be described and their use justified with reference to appropriate guidance and/or agreement with the relevant consultation bodies.	The ES sets out the methodology that has been used to assess the magnitude of impact on the marine environment and that the methodology used is justified by reference to appropriate guidance/ publications and water quality modelling undertaken for the Proposed Development that has been agreed with the relevant consultation bodies.	Section 9.5 Assessment methodology, ES Appendix 19.5 Eastney Long Sea Outfall Solent dispersion modelling, Volume II (Document reference 6.2, DCO Volume 6) ES Appendix 19.6 Havant Thicket Reservoir Compensatory Flows water quality modelling, Volume II (Document reference 6.2, DCO Volume 6) ES Appendix 19.8 Hampshire Water Transfer and Water Recycling Project Eastney Long Sea Outfall – CORMIX Modelling for Chemicals Screened in via the Surface Water Risk Assessment Process, Volume II (Document reference 6.2, DCO Volume 6)

Scoping Opinion ID	Summary of Scoping Opinion comment	How the ES addresses the Scoping Opinion comment	Where addressed in the ES
ID 3.4.14	The EIA Scoping Opinion requested determination of the need for underwater noise modelling.	The ES considers the potential for underwater noise propagation and provides an assessment of effects on marine biodiversity with a focus on fish. The assessment findings have been shared with the relevant consultation bodies (MMO, EA and NE) in the Technical Working Group meeting in February 2025 where it was agreed that underwater noise modelling is not needed.	Section 9.8 Assessment of likely significant effects
ID 3.4.15	The EIA Scoping Opinion requested including other Marine Conservation Zones (MCZs) within the vicinity in the assessment where there is potential for likely significant effects to occur.	The ES demonstrates the absence of likely significant effects on the MCZs with agreement from the relevant consultation bodies (MMO, EA and NE). As identified in the Habitats Regulations Assessment and Marine Conservation Zone Assessment (Document reference 5.2, DCO Volume 5), only Bembridge MCZ is considered to be hydrologically connected to the Eastney LSO as it is situated within two tidal excursions (refer to Table 9-8). Utopia MCZ and Selsey Bill and the Hounds MCZ are further than two tidal ellipses from the Eastney LSO and thus have not been assessed.	Section 9.5 Assessment methodology, and section 9.7 Baseline conditions
ID 3.4.16	The EIA Scoping Opinion requested the ES to explain how Study Area 3 relates to the assessment of effects.	The ES concludes that it should include study areas 1 and 2 only. Study area 3 was erroneously included. The ES discusses the justification for defining the study area and relationship to the assessment of effects.	ES Figure 9.1 Marine ecology study areas 1 and 2, Volume III (Document reference 6.3, DCO Volume 6) and ES Figure 9.5 Habitat mosaic surveyed by sidescan sonar across Langstone Harbour, south of Hayling Island and south of

Scoping Opinion ID	Summary of Scoping Opinion comment	How the ES addresses the Scoping Opinion comment	Where addressed in the ES
			Eastney, Volume III (Document reference 6.3, DCO Volume 6).

Engagement

9.3.4 This section provides details of the ongoing technical engagement that has been undertaken with stakeholders in relation to marine biodiversity.

EIA Working Groups

9.3.5 Five EIA Working Groups were established as forums for ongoing engagement with statutory bodies regarding the Proposed Development. These Working Groups when combined cover all of the assessment topics considered by the EIA. A full description of each of the EIA Working Groups, the key stakeholders, and an overview of the topics presented can be found in ES Chapter 5 EIA approach and methodology, Volume I, (Document reference 6.1, DCO Volume 6). This section presents a summary of the topics covered in the EIA Working Groups which are of relevance for the marine biodiversity assessment.

9.3.6 The Biodiversity and Water Environment EIA Working Group, which includes Contaminated land, Marine biodiversity, Water environment, Land quality and ground conditions, and Terrestrial and freshwater biodiversity, has been the main forum for engagement for marine biodiversity. There have been 12 Biodiversity and Water Environment EIA Working Group meetings between Summer 2022 and DCO application. Technical officers from Hampshire County Council (HCC), EBC, FBC, HBC, PCC, EHDC, EA, NE and MMO attended the EIA Working Group meetings.

9.3.7 The following overarching themes were covered across the EIA Working Group meetings:

1. Introduction and background to the Proposed Development.
2. Overview of the baseline environment.
3. EIA scoping which included setting out the proposed approach to EIA scoping, key risks and receptor types, providing an overview of the EIA Scoping Report (Document reference 6.2, DCO Volume 6) and seeking feedback on the EIA Scoping Opinion (Document reference 6.2, DCO Volume 6).
4. An overview of the Preliminary Environmental Information Report (PEI Report), including setting out the baseline and approach to mitigation, as well as providing an overview of the PEI Report findings.
5. Updates on the approach to development of the design of the Proposed Development.
6. Briefings on the materials to be consulted on, including design and environmental assessment related matters, ahead of Summer 2022, Summer 2024 and Spring 2025 Consultation.

7. Approach to mitigation, Commitments Register (Document reference 6.2, DCO Volume 6) and associated management plans are provided with the DCO application.
8. Consultation feedback and updated on scheme development, and design principles following the Summer 2024 Consultation and PEI Report.
9. Updates on EIA progress and development of mitigation, including management plans and the Commitments Register.
10. An overview of the ES, including setting out the baseline and any updates from the PEI Report, as well as providing an overview of the findings of the EIA.

9.3.8 Comments received as part of the EIA Working Groups and matters resolved in relation to marine biodiversity included:

1. EIA scoping was discussed and the phasing of the operational capacity of the Proposed Development has been taken into consideration.
2. Results of surveys completed to date were summarised, and the approach to accessing additional baseline data around the existing Eastney LSO were discussed. The additional surveys around the existing Eastney LSO were completed in 2024.
3. The approach to sand eel surveys using eDNA to record the existing fish and other species communities that are likely to be within the water column around the Eastney LSO was discussed to complement desk study and other surveys. The eDNA sampling and analysis were completed in 2024.
4. No comments were raised following a presentation of the marine biodiversity PEI Report chapter, looking at the preliminary assessment scope, primary and tertiary mitigation, preliminary assessment findings and monitoring and enhancements.
5. The additional construction of the SuDS outfall at the intertidal section of Hermitage Stream and additional scoping of its potential effects including introduction of INNS and direct loss of artificial habitat were discussed, and in response to a comment, increased sedimentation has been added to the assessment of potential significant effects.
6. Updates on the marine ecology baseline information was advised. The latest national seagrass layer (England) dated August 2025 was incorporated into the ES Figure 9.3 Seagrass beds in study areas, Volume III (Document reference 6.3, DCO Volume 6).

Technical Working Group

9.3.9 The EA, NE and the MMO have been engaged on a monthly basis through the Technical Working Group. These meetings allowed for regular communication of progress on key elements such as updates on the marine ecology baseline, marine assessments and reviewing the survey protocol and results for the Proposed Development to inform the assessment of likely significant effects.

9.3.10 Comments received as part of the Technical Working Group and matters resolved in relation to marine biodiversity included the following:

1. The assessment findings of potential effects of underwater noise and vibration associated with construction of the Pipelines (between Budds Farm

Wastewater Treatment Works and the Water Recycling Plant site) on fish and fish eggs were discussed, and it was agreed that underwater noise modelling was not needed.

2. MMO comments on the EIA Scoping Report were received on 29 January 2024 and therefore not incorporated into the EIA Scoping Opinion that was adopted by the Planning Inspectorate in August 2023. Comments in relation to marine biodiversity are set out in an issue log and these were discussed with MMO and taken into consideration in the assessment.
3. Natural England comments with respect to sand eel were received on 5 November 2025. An additional desk study on habitat suitability for sand eel was conducted following NE's advice, and the findings were presented in the meeting on 22 January 2026, in which NE agreed that sand eel surveys are not required.
4. Potential impact of the SuDS outfall at the intertidal section of Hermitage Stream during operation was discussed and the concern regarding European eel associated with this outfall has been taken into consideration (as discussed in paragraph 9.8.71).

Technical engagement

9.3.11 One-to-one technical engagement on the Proposed Development and matters related to marine biodiversity has also been undertaken with EA, FBC, HCC, HBC, MMO, NE and Rowlands Castle Parish Council. These meetings allowed for the regular communication of progress on key elements such as the LSO discharge impacts.

Bilateral meetings

9.3.12 Statutory consultees including the Southern Inshore Fisheries and Conservation Authority (IFCA), Sussex IFCA and the Langstone Harbour Board have been consulted on a regular basis through bilateral meetings and, in the case of Langstone Harbour Board, through membership of the Water and Wildlife Interest Group. These meetings allowed for the regular communication and placing of data requests to inform the baseline.

Wildlife and Water Interest Group

9.3.13 Engagement with non-statutory stakeholders that have an interest in marine biodiversity has taken place through the Water and Wildlife Interest Group. A full description of the Wildlife and Water Interest Group, the non-statutory stakeholders, and an overview of the topics presented can be found in ES Chapter 5 EIA approach and methodology, Volume I, (Document reference 6.1, DCO Volume 6). This section presents a summary of the main themes and matters covered in the Wildlife and Water Interest Group which are of relevance to the marine biodiversity assessment.

9.3.14 The following overarching themes were covered across the Wildlife and Water Interest Group meetings:

1. Introduction and background to the Proposed Development, including the assessment timescales, key issues and risks.

2. Overview of the baseline environment and surveys undertaken.
3. An overview of the development of the ES, including Proposed Development design and responses to the EIA Scoping Report.
4. Overview of surveys and their programmes, potential impacts of the Proposed Development and preliminary mitigation options.

9.3.15 Comments received as part of the Wildlife and Water Interest Group meetings and matters resolved in relation to marine biodiversity included:

1. The first meeting (18 July 2022) of the Wildlife and Water Interest Group noted that all data (unless confidential) will be presented within the ES.
2. The first meeting requested consideration of recreational fisheries interest within Langstone and Chichester Harbour as part of the assessment. This was confirmed post-meeting that this has been considered.
3. The fourth meeting (23 May 2024) raised queries on the way forward for washouts regarding whether tanks could store water from washouts that could be emptied, and what the volume of water and frequency of release would be. The OEMP (Document reference 7.7, DCO Volume 7) includes details of washout management measures for isolation valves, air valves and washout valves. Washout valves would be used during the commissioning process and subsequently tested every six months during operation. All water would be collected directly in a tanker for disposal at an appropriately licenced facility, with no source water discharged to the environment (land or watercourse). This approach ensures that no water would be released into the marine environment, details are provided in section 3.6 of ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6).

9.4 Primary and tertiary mitigation

Primary measures

9.4.1 As described in ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6), a range of measures have been embedded into the Proposed Development design to avoid or reduce environmental effects. These primary mitigation measures relevant to marine biodiversity, which form part of the design that has been assessed are:

1. Avoiding all statutory and non-statutory designated sites.
2. Minimising interaction with marine priority habitats, avoiding those with no or little capacity to recover.
3. Avoiding sites supporting protected species.
4. Lighting design to avoid permanent lighting on dark landscapes and nature conservation locations, and to avoid illuminating the lagoons and the coastal habitat, in accordance with the Design Principles Document (Document reference 5.11, DCO Volume 5).

9.4.2 For the proposed SuDS outfall, there is a specific design principle included in the Design Principles Document (Document reference 5.11, DCO Volume 5) which states that *"The design of the hard infrastructure comprised in the SuDS outfall will seek to reduce disturbance of the existing scour protection on the banks of Hermitage Stream and not protrude into Hermitage Stream more than existing*

outfalls. The design will retain existing transitional habitats (including gravel bars and mudflats that are exposed during low tide) at the foot of the banks and avoid operational disturbance to these habitats. To deter the passage of eels inside the SuDS outfall pipe, a step will be placed within the SuDS outfall pipe. The step will be a minimum of 0.3m in height and have an overhang/lip."

Tertiary measures

9.4.3 Good construction practices are set out in the Outline CEMP (Document reference 7.1, DCO Volume 7) which is secured by a requirement in the DCO and would manage the effects of construction. The measures of particular relevance to marine biodiversity are:

1. In the event that unexpected contamination is encountered through spillage of fuels, oil or other chemicals which could have a negative impact on a sensitive marine habitat (through smothering or damage), work in the area would cease on instruction by the Contractor and be contained and made safe pending assessment by a suitably qualified environmental specialist.
2. A Construction Drainage Plan will be prepared by the Contractor. This will incorporate measures to reduce/remove risk of site sediments being dispersed to sensitive areas such as site drainage systems that will incorporate interceptor drains for the settlement of sediment (including sediment traps - locally wider/deeper areas of drains that encourage passive deposition). Where water enters construction areas, water will be pumped via settling tanks/filtration ponds before being released to local ditches or drains via interceptor drains to remove sediment. The production of this plan is secured through the Outline CEMP (Document reference 7.1, DCO Volume 7).
3. The Contractor will undertake a detailed Foundation Works Risk Assessment (FWRA) in line with the Environment Agency's Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention [34]. The detailed FWRAs will include detailed Piling Risk Assessments and an assessment of other foundation types. The detailed FWRAs will be undertaken in consultation with the EA, relevant local planning authority and other relevant bodies (if applicable). The Outline FWRAs (Document reference 7.15, DCO Volume 7) include outline versions of the Piling Risk Assessment and an assessment of other foundation types.
4. The Outline CEMP (Document reference 7.1, DCO Volume 7) includes measures pertinent for marine biodiversity focussing on works near the tidal section of Hermitage Stream and other measures pertinent for water environment when working in Flood Zone 2 or 3 to manage site safety and reduce pollution risk during periods of extreme weather (i.e. flooding).
5. Good practices in controlling the amount of light generated on site and task lighting are secured through the Outline CEMP (Document reference 7.1, DCO Volume 7) that would reduce potential light disturbance to migratory fish where working after dark near Hermitage Stream is needed.
6. The Outline CEMP (Document reference 7.1, DCO Volume 7) includes measures when working in the intertidal section of Hermitage Stream to manage pollution risk and reduce sediment dispersion and underwater noise and vibration.

7. A Drilling Fluid Management Plan (DFMP) will be developed by the Contractor and agreed with the EA and NE prior to commencement of construction activities, and the production of this DFMP is secured through the Outline CEMP (Document reference 7.1, DCO Volume 7)

9.4.4 An OEMP (Document reference 7.7, DCO Volume 7) has also been developed for the Proposed Development. The OEMP provides commitments for the operational stage of the Proposed Development. This includes general operational practices which reduce the potential to have an environmental impact, management and control measures that would be in place to avoid potential pollution events during operation.

9.4.5 The management of marine INNS during construction and operation is set out within the Invasive Non-Native Species (INNS) Biosecurity Plan (Document reference 7.10, DCO Volume 7) and cross-referenced within the Outline CEMP and OEMP in view of the inclusion of the SuDS outfall in the design of the WRP site as part of the Proposed Development. The SuDS outfall would be constructed at the tidal section of Hermitage Stream for releasing surface water flow from the SuDS of the WRP site, so there is a potential pathway for INNS to enter water column during construction and operation. This INNS Biosecurity Plan provides recognised standard practices (such as 'Check-Clean-Dry' protocols, materials to be certified clear of INNS, etc.) to reduce introduction and spread of marine INNS.

9.4.6 Decommissioning will be subject to the appropriate permits, consents and regulatory environment at the relevant time. Decommissioning activities are expected to follow good industry practice in place at the time, anticipated to be similar in nature to measures contained in the Outline CEMP (Document reference 7.1, DCO Volume 7).

9.5 Assessment methodology

Scope of assessment

9.5.1 Likely significant effects requiring assessment may be temporary or permanent, direct, indirect, secondary, cumulative, in-combination, beneficial or adverse and may occur during construction, operation or decommissioning. Potential likely significant effects on marine biodiversity receptors within the scope of the assessment are summarised in Table 9-6. The scope of the assessment has responded to feedback received as described in section 9.3 and is elaborated as follows.

9.5.2 Effects from decommissioning of the Proposed Development are considered to be no greater than those identified during the construction phase and are therefore assessed to be of the same significance as those assessed for construction, refer to ES Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6) section 3.7 for additional information on decommissioning.

9.5.3 Cumulative effects are those from the interrelationship between the Proposed Development with other developments (inter-project). These are reported within ES Chapter 20 Cumulative and in-combination effects, Volume I (Document reference 6.1, DCO Volume 6).

9.5.4 In-combination effects are those that result from the interaction of individual effects combined together on a single receptor or resource at a single point in time. Where the in-combination effects for marine biodiversity are inherently assessed, these are reported within section 9.8 of this chapter, for example, effects associated with pollution events or changes to water quality, and underwater noise and vibration. However, where a receptor is affected by multiple topics and there is the potential for significant in-combination effects to occur, these aggregated effects are reported within ES Chapter 20 Cumulative and in-combination effects, Volume I (Document reference 6.1, DCO Volume 6).

9.5.5 Table 9-6 sets out the summary of the scope for the assessment in this chapter. All scoped out elements as agreed in the EIA Scoping Opinion are confirmed in ES Appendix 5.3 Response to EIA Scoping Opinion, Volume II (Document reference 6.2, DCO Volume 6).

Table 9-6 Summary of the scope for marine biodiversity assessment

Effect	Construction	Operation	Decommissioning
Pollution events associated with the WRP site and its SuDS outfall, including indirect effects resulting in temporary habitat loss from pollution	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).	Scoped out (all marine biodiversity).	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).
Habitat loss associated with the SuDS outfall	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).	Scoped out (all marine biodiversity).	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).
Introduction of INNS associated with the SuDS outfall	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1)
Light disturbance associated with the WRP site and task lighting	Scoped in (for designated sites; marine habitats; benthic marine species; fisheries within Langstone Harbour/study area 1). Scoped out (marine mammals and fish).	Scoped in (for designated sites; marine habitats; benthic marine species; fisheries within Langstone Harbour/study area 1). Scoped out (marine mammals and fish).	Scoped in (for designated sites; marine habitats; benthic marine species; fisheries within Langstone Harbour/study area 1). Scoped out (marine mammals and fish)
Underwater noise and vibration associated with the Pipelines between Budds Farm Wastewater Treatment Works and	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1, except marine	Scoped out for all marine biodiversity (underwater noise and vibration would only be generated	Scoped out for all marine biodiversity (as underwater noise and vibration would only be generated during the

Effect	Construction	Operation	Decommissioning
the Water Recycling Plant site	habitats in view of no impact pathway).	during the construction phase).	construction phase, not during the decommissioning phase as the pipelines are intended to be left in situ).
Construction effect of increased sedimentation associated with the SuDS outfall	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).	Scoped out (all marine biodiversity).	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).
Operational effect of freshwater influence from SuDS outfall into the Hermitage Stream	Scoped out (all marine biodiversity).	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).	Scoped out (all marine biodiversity).
Operational effect of changes in water quality of Hermitage Stream from releases of compensatory flows from Havant Thicket Reservoir (HTR)	Scoped out (all marine biodiversity).	Scoped in (for all marine biodiversity receptors within Langstone Harbour/study area 1).	Scoped out (all marine biodiversity).
Changes in water release from Eastney LSO during operation	Scoped out (all marine biodiversity).	Scoped in (all marine biodiversity)	Scoped out (all marine biodiversity).

9.5.6 The main components of the Proposed Development that are considered to interact with the marine environment and potentially result in effects on marine ecological receptors are the following:

1. WRP site
2. SuDS outfall at the bank of Hermitage Stream
3. Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site
4. Release of compensatory flows from HTR into Hermitage Stream and Langstone Harbour during operation
5. Release of WRP reject water from the existing Eastney LSO during operation

9.5.7 These components occupy different geographical areas within the ZoI. As a result, it is necessary to define multiple study areas to cover these geographical extents.

9.5.8 The HTR would be operated by Portsmouth Water and would release water as ‘compensatory flows’ to Riders Lane Stream which flows south from the reservoir to the Hermitage Stream and into Langstone Harbour (refer to ES Appendix 19.6 Havant Thicket Reservoir Compensatory Flows water quality modelling, Volume II, (Document reference 6.2, DCO Volume 6)). When the WRP is in operation, the recycled water from the WRP site would be combined with water contained within HTR.

9.5.9 A few elements of the Proposed Development are not considered to interact with the marine environment and are therefore scoped out from the study area or consideration of their effects on marine biodiversity:

1. The use of pipelines, that have been consented and will be constructed separately by Portsmouth Water[1,2], between Bedhampton Springs and HTR to transfer recycled water from the WRP site to HTR are not considered to interact with the marine environment.
2. The AGP components of the Proposed Development – These components involve Intermediate Pumping Stations (IPSs) and Break Pressure Tanks (BPTs) which are all located outside Flood Zone 2 or Zone 3 and at a significant distance from both the Hermitage Stream and Langstone Harbour. As such, there is no hydrological connection of any BPT/IPS sites to the marine environment under flood conditions. During operation BPT washout would be required at the BPT/IPS sites (ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6)). However, as set out in the OEMP (Document reference 7.7, DCO Volume 7) no operational washout flows are to be discharged into the environment, thus washout from BPT/IPS sites would not cause any effect on the marine environment. Therefore, all the AGP components are not considered to interact with the marine environment and are scoped out from consideration for their effects on marine biodiversity and not considered in the definition of the study area.
3. Water from washout valves – There would be water used for testing of washout valves during commissioning of the pipelines and operation of the Proposed Development. Washout releases from pipelines during commissioning and operational phases would be collected directly by a tanker with no source water to be discharged to the land, watercourse or marine environment (refer to section 3.6 in ES Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6) and also presented in the OEMP (Document reference 7.7, DCO Volume 7). Therefore, washout releases from pipelines are not considered to interact with the marine environment and are not considered again in the chapter.
4. The Pipelines between the Water Recycling Plant site and Bedhampton Springs and the Pipeline between the Water Recycling Plant site and Otterbourne Water Supply Works are scoped out from consideration for their effects on marine biodiversity as agreed in the EIA Scoping Opinion (refer to Table 9-5 in section 9.3 and also EIA Scoping Opinion ID 3.4.2 in ES Appendix 5.3 Response to EIA Scoping Opinion, Volume II (Document reference 6.2, DCO Volume 6)).

Study area

9.5.10 This section describes the spatial scope (the area which may be impacted) for the assessment as it applies to marine biodiversity.

[1] Planning application for the Havant Thicket reservoir (reference APP/20/00990) was considered and granted permission by Havant Borough Council and East Hampshire District Council in 2021.

[2] Planning application for the Portsmouth Water pipeline (reference APP/24/00405) was considered and granted permission with conditions and legal agreement by Havant Borough Council in 2025.

9.5.11 Two study areas have been considered for marine biodiversity which are the same for both marine ecology and fisheries, as shown in ES Figure 9.1 Marine ecology study areas 1 and 2, Volume III (Document reference 6.3, DCO Volume 6). The study areas are based on the ZoI of the Proposed Development. The ZoI is defined as the area in which ecological features (including habitats and species) could be affected by biophysical changes as a result of the Proposed Development. The ZoI extends beyond the Order Limits, for example where there is hydrological or habitat connectivity. The ZoI varies for different ecological features depending on their sensitivity to an environmental change, or the extent of their range.

Study area – marine ecology

9.5.12 Study areas 1 and 2 (ES Figure 9.1 Marine ecology study areas 1 and 2, Volume III (Document reference 6.3, DCO Volume 6)) have been established using the most recent CIEEM guidelines on ecological impact assessment [32]. This guidance recommends that all ecological features that occur within the ZoI for the Proposed Development are considered for potential effects. Under the CIEEM guidelines [32], the ZoI includes:

1. Areas directly within the land take for the Proposed Development and access
2. Areas that would be temporarily affected during construction
3. Areas likely to be impacted via hydrological connection as existing impact pathways are extended by existing currents, flows during rainfall and tidal effects or any changes to these connections brought about by the Proposed Development, and also constitutes areas that may functionally relate to effects or changes brought about by the Proposed Development
4. Areas where there is a high risk of pollution and noise disturbance during construction and/or operation

9.5.13 The ZoI is generally defined as presented in Table 9-7. The ZoI is variable depending on the nature of the construction activities and the ecological receptors present. For marine ecology each study area is considered to be the ZoI defined using hydrological connectivity. This is due to hydrological connectivity of the Proposed Development with the marine environment leading to the greatest potential for impacts to influence marine ecology receptors.

Table 9-7 Marine ecology ZoI

Type of site	Distance from Proposed Development	Justification
All designated marine sites	2km	Considering the construction methodology and operational description of the Proposed Development (ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6)), it is considered that this 2km buffer reflects a precautionary distance within which designated features may be affected. This is in line with guidance on considering protected areas when undertaking WFD assessments in estuarine and coastal waters [35].
Hydrologically connected statutory designated sites	10km	This distance is considered to cover the maximum dispersion potential of any deleterious substances that may enter the water and is based upon the tidal excursion anticipated for the region. [36]

Type of site	Distance from Proposed Development	Justification
Sites designated for marine mammals	30km	This distance is based upon the typical daily travelling distance for marine mammal species which are known to exhibit spatial dependency. Typically, grey seal is reported to conduct mean round trips of 39.8km related to journeys returning back to the same haul-out locations [33] so their daily transit is likely to be less than 20km, whilst harbour porpoise has been reported to travel on average 26.0km per day [37]. As such this distance is the point at which designated travelling marine mammals would frequently transit into the study area and could be affected by the Proposed Development components.

9.5.14 For marine ecology the study area is considered to be the entirety of the marine ecology ZoI defined using hydrological connectivity outlined in Table 9-8. Note that due to the proximity and the hydrological connection between Eastney LSO and Langstone Harbour the two study areas overlap spatially.

Table 9-8 Study area for marine ecology defined by the ZoI

Study area	ZoI (study area is based on the ZoI)	Features present	Justification
Study area 1: The entirety of Langstone Harbour, including the tidal extent of Hermitage Stream (refer to ES Figure 9.1 Marine ecology study areas 1 and 2, Volume III (Document reference 6.3, DCO Volume 6)	Designated marine sites in the entire Langstone Harbour – this area is immediately adjacent to the Budds Farm WTW and is the anticipated extent of any potential pollution events that may affect the marine environment based upon approximate tidal excursions for the region. The extent has been defined as the area below the MHWS that extends from the Portcreek Viaduct crossing in the west, to the obstruction in the east from the remains of the old Hayling railway bridge and to the south until the Langstone Harbour limits as shown on Admiralty charts.	Marine designated sites and marine species	The area of Langstone Harbour (and its tidal extent within the Hermitage Stream) has been assigned as a study area due to the following components of the Proposed Development: • WRP site • SuDS outfall at the bank of Hermitage Stream • Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site All of these components involve undertaking construction activities either below the MHWS, adjacent to the marine environment, within Flood Zones 2 and 3 which connect to the marine environment under flood conditions, or underneath a watercourse which connects to the marine environment [38]. As such, there is a risk to the marine environment of pollution spills and a potential for blow-out during pipeline construction (the pipelines cross watercourses connected to the marine environment in Langstone Harbour). Underwater noise and vibration may be generated during the construction of the Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site as this pipeline would pass under Hermitage Stream which could impact migratory marine fish species. Noise and visual disturbance to wading birds using the marine area is possible due to their proximity to the Proposed Development. All impacts on birds (including those using the marine area) are considered separately within ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6). During operation, the compensatory flows (release of water) from HTR to downstream waterbodies is connected to the tidal section of Hermitage Stream as well as Langstone Harbour (refer to ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6). Accordingly, any

Study area	ZoI (study area is based on the ZoI)	Features present	Justification
			water quality changes (including any potential positive or negative changes) in the compensatory flows associated with the Proposed Development's use of HTR to store recycled water, in addition to the consented spring water storage, may affect the marine ecology within or migrating through this area. Chichester Harbour has been excluded from study area 1 as there is only limited sediment transport and exchange between Langstone Harbour and Chichester Harbour given the narrow harbour entrances and very low wave energy conditions [39]. The net water volume input from Chichester Harbour into Langstone Harbour, as described in the referenced information [39] indicates that Chichester Harbour predominantly flows into Langstone Harbour. Therefore, any potential influence on Chichester Harbour would be unlikely.
Study area 2: 10km from the Eastney LSO within the Solent (refer to ES Figure 9.1 Marine ecology study areas 1 and 2, Volume III (Document reference 6.3, DCO Volume 6))	Hydrologically connected statutory designated sites – 10km from the discharge point of the Eastney LSO located within the Solent (anticipated extent of hydrological connection based upon tidal excursion and search range for transitory species).	Marine designated sites and marine species	This study area of 10km surrounding the existing Eastney LSO is based on the following element of the Proposed Development: • Release of WRP reject water combined with the existing Budds Farm WTW treated wastewater flows from the Eastney LSO during operation The Eastney LSO is situated within the Solent; a 10km buffer reflects a precautionary distance within which designated features may be affected (anticipated as the point at which designated marine mammals and fish species may transit into the study area and could be affected by the WRP operation). Additionally, this precautionary 10km distance is greater than the range of two tidal excursions at this location [36]. Therefore, it is considered that any changes to released water would have fully dispersed through the water column after this distance.

Study area - fisheries

9.5.15 Currently, there are no specific guidelines to define the spatial extent of fisheries studies. An appropriate study area for fisheries is determined based on the parameters of the potential effects. Consequently, the study area has been defined in line with the marine ecology study areas described in Table 9-8. These comprise the entirety of Langstone Harbour including the tidal extent of Hermitage Stream (study area 1) and the 10km ZoI established around the Eastney LSO (study area 2) established in line with CIEEM guidelines [32] (refer to Table 9-8).

9.5.16 Commercial fisheries landings data is spatially defined by the International Council for the Exploration of the Sea (ICES) Statistical Rectangles. Due to the size of each ICES rectangle, and the nature of fisheries derived data recording methods for landing statistics, this often extends beyond the ZoI. Accordingly, their use provides a broader analysis of commercial fisheries operating within the wider regional area. The Proposed Development is located within ICES Division VIId (Eastern Channel). Fisheries data within each ICES Division is collected and analysed by ICES statistical rectangle. Assessment of commercial fisheries landing activity has been undertaken using information across the ICES rectangles which intersect with the ZoI that defines the study areas. This includes the following:

1. ICES statistical rectangle 30E8 (contains Eastney LSO)
2. ICES statistical rectangle 30E9

9.5.17 The spatial and temporal distribution, catch and value and fishing effort for recreational fisheries are not captured or reported in the same way as commercial fisheries data. In the absence of defined spatial reporting areas for recreational fisheries, the study area for commercial fisheries has been adopted for potential effects relevant to charter fishing boats and shore-based recreational fishing activity. In addition, recreational fisheries interest within Langstone and Chichester Harbours have been considered as part of the assessment.

9.5.18 Study areas 1 and 2 have been used to identify fisheries activities in areas which could be affected by the Proposed Development and the levels of fishing that these areas sustain. These ICES rectangles include Portsmouth Harbour, Langstone Harbour, Chichester Harbour and the Solent within their boundary. The ZoI for fisheries is displayed visually in ES Figure 9.2 Fisheries study areas and ICES statistical rectangles, Volume III (Document reference 6.3, DCO Volume 6) against the ICES rectangles.

Assessment scenarios

9.5.19 Environmental Statement Chapter 5 EIA approach and methodology, Volume I, (Document reference 6.1, DCO Volume 6) provides an overview of the Proposed Development's approach to the temporal scope (the timescales over which impacts may occur) of the EIA. This section describes the temporal scope for the assessment as it applies to marine biodiversity.

9.5.20 Marine biodiversity desk studies and baseline surveys to inform the impact assessment for the Proposed Development started in 2022 and were completed in 2024. The results of these studies and surveys have determined the pre-construction requirements and post construction monitoring.

9.5.21 The temporal characteristics of potential impacts are considered on a receptor-by-receptor basis in the assessment, as the response of marine biodiversity receptors to potential impacts can vary temporally. For example, short-term impacts on receptors with comparatively short life cycles can result in greater impacts than on receptors with longer life cycles.

9.5.22 For the assessment, construction effects are taken to be those for which the source begins and ends during the construction and commissioning stages prior to the Proposed Development becoming fully operational. Therefore, this assessment considers effects over the entire construction period.

9.5.23 For the assessment, operational effects include those that start once the Proposed Development is commissioned and fully operational and include the effects of the infrastructure in terms of its operation, use and maintenance, repairs and upgrades, including the permanent change in land use for the operational period.

9.5.24 For the assessment, decommissioning effects have been assessed qualitatively. The assessment considers effects of the potential decommissioning activities (such as decommissioning of the WRP and pipelines) that may have impact pathway on marine biodiversity receptors.

9.5.25 Timescales associated with these effects considered from the guidance of ecological impact assessment [32], regardless of whether they are in the construction or operational phase are as follows:

1. Short-term - endures for up to a period of 12 months
2. Medium-term - endures for between one and five years
3. Long-term - endures for between five and 15 years
4. Permanent effects - endures for more than 15 years and/or effects which cannot be reversed.

Baseline methodology

Desk study

9.5.26 Baseline data collection has been undertaken to access information across the study area. This section provides the approach to collecting baseline data.

9.5.27 The following data sources have been accessed to inform the baseline with respect to marine biodiversity (refer to Table 9-9). In addition to these data sources, the marine biodiversity assessment draws on environmental baseline data collated for other topics, specifically, data presented in the following ES Chapters:

1. ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6) – data of designated sites scoped in
2. ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6) – water quality baseline data that formed the dispersion modelling results.

Table 9-9 Data sources used to inform the marine biodiversity assessment

Source of data	Baseline data
MAGIC Maps (Defra) [40]	Designated sites data (accessed May 2025)
Centre for Environment, Fisheries and Aquaculture Science (Cefas), Science Series Technical Report no. 147 [41]	A report namely *"Spawning and nursery grounds of selected fish species in UK waters"* that provides information of spawning and nursery grounds of ecologically important fish habitats which are included within the assessment scope (accessed May 2025)
Cefas [42]	Bivalve mollusc production bed areas and current classification status (accessed May 2025)
Cefas [43]	Annual fish surveys undertaken between 2016-2020 (broader scale), including the bass survey (received February 2023)
JNCC [44]	Publicly available marine recorder results on benthic data such as species, biotopes and physical attributes (accessed May 2025)
Southern IFCA [45]	Annual trawl fish surveys 2016-2020 (received February 2023)
Sussex IFCA [46]	For Chichester Harbour only: Small fish survey data (2019-2021) and oyster stock assessment pre-season (2019-2021) (received February 2023)
Langstone Harbour Board [47] [48]	For Langstone Harbour only: Small fish survey data (2012–2017, and 2023 received from Langstone Harbour Board's consultation response for the Summer 2024 Consultation)
MMO fisheries landing statistics [49]	Commercial fisheries landings/economic value data accessed for the data reporting period of 2019-2023 (accessed April 2025)
Automated Identification System (AIS) surveillance data [50]	Observations of live AIS vessel tracking were undertaken four times at equidistant points throughout both days. All vessels observed within the study area were 10m and under in length and using either potting or towed demersal gear (accessed April 2025)
Global Fishing Watch [51]	Spatial distribution of fishing activity for all relevant fishing gear types spanning a five-year data reporting period between 2020 and 2024 (accessed May 2025)
ORCA [52]	Whale and dolphin sightings (accessed March 2025)
The Wildlife Trusts [53]	Fact file of Selsey Bill and the Hounds MCZ (accessed March 2025)
Sea Watch Foundation [54]	Sightings of marine mammals in the Southern England area (accessed March 2025)

Site surveys

9.5.28 The marine biodiversity baseline surveys undertaken across the study areas were:

1. Habitat walkover of Hermitage Stream (refer to ES Appendix 9.2 Migratory fish survey report in Volume II) (Document reference 6.2, DCO Volume 6).
2. Marine migratory fish surveys (refer to ES Appendix 9.2 Migratory fish survey report in Volume II) (Document reference 6.2, DCO Volume 6).
3. Intertidal seagrass surveys in study area 1 (refer to ES Appendix 9.3 Intertidal seagrass survey report in Volume II) (Document reference 6.2, DCO Volume 6).

4. Intertidal biotope survey in study area 1 (refer to ES Appendix 9.4 Intertidal survey results in Volume II) (Document reference 6.2, DCO Volume 6). Particle size analysis in study area 1 (refer to ES Appendix 9.4 Intertidal survey results and 9.5 Subtidal geophysical survey report in Volume II) (Document reference 6.2, DCO Volume 6).
5. Habitat classifications within study area 1 (refer to ES Appendix 9.5 Subtidal geophysical survey report in Volume II) (Document reference 6.2, DCO Volume 6).
6. Subtidal survey within study area 1 (refer to ES Appendix 9.5 Subtidal geophysical survey report and Appendix 9.6 Subtidal grab sampling report in Volume II) (Document reference 6.2, DCO Volume 6).
7. Benthic ecology in study area 2 (refer to ES Appendix 9.10 Eastney Long Sea Outfall benthic ecology survey in Volume II) (Document reference 6.2, DCO Volume 6).
8. eDNA sampling and analysis in study area 2 (refer to ES Appendix 9.11 Eastney Long Sea Outfall environmental DNA sampling and analysis in Volume II) (Document reference 6.2, DCO Volume 6).

Assessment methodology

9.5.29 The outcomes of several water quality modelling studies have been used to inform the assessment of operational effects on marine biodiversity as a result of the Proposed Development. The modelling outcomes present the predicted difference in water quality parameters and chemical concentration in Hermitage Stream, Langstone Harbour and Eastney LSO between the existing scenario and the future scenario of the WRP operation. This informs the potential effect of changes to existing water quality from water release during WRP operation on marine biodiversity receptors. These modelling studies include:

1. ES Appendix 19.5 Eastney Long Sea Outfall Solent dispersion modelling, Volume II (Document reference 6.2, DCO Volume 6).
2. ES Appendix 19.6 Havant Thicket Reservoir Compensatory Flows water quality modelling, Volume II (Document reference 6.2, DCO Volume 6).
3. ES Appendix 19.8 Hampshire Water Transfer and Water Recycling Project Eastney Long Sea Outfall – CORMIX Modelling for Chemicals Screened in via the Surface Water Risk Assessment Process, Volume II (Document reference 6.2, DCO Volume 6).
4. ES Appendix 19.12 Water Recycling Plant site Sustainable Drainage System dispersion modelling, Volume II (Document reference 6.2, DCO Volume 6).

9.5.30 The approach to assessment is set out in ES Chapter 5 EIA approach and methodology, Volume I (Document reference 6.1, DCO Volume 6). This has informed the approach used in this marine biodiversity assessment.

9.5.31 Marine ecology and fisheries are assessed using the best practice Ecological Impact Assessment (EcIA) guidelines published by CIEEM [32]. The CIEEM guidelines stipulate that *"EcIA reports should be tailored to suit individual circumstances and different formats are acceptable*", therefore where appropriate, the methodology has been modified to suit the types of receptors and context of the Proposed Development.

9.5.32 The methodology for the assessment of likely significant effects is largely the same for marine ecology and fisheries. However, each receptor group has varying definitions in terms of importance or vulnerability of receptor and magnitude of impact. The sections below outline the considerations for both topics and the overall method for assessing likely significant effects resulting from the Proposed Development during construction, operation and decommissioning.

9.5.33 There is no statutory definition of what constitutes a likely significant effect. The interpretation of the significance of an effect takes account of any relevant legislation, policy, and guidance. The methodology for assessing effects as part of the EIA adopts the following three stage process to assess the likely significance of any effect on marine ecology and fisheries:

1. Step 1: Identification of the baseline conditions and the ecological importance of receptors and vulnerability of the fishery within the identified study areas (refer to Table 9-10 and Table 9-11)
2. Step 2: Identification of the magnitude (i.e. size) of change (impact) upon each receptor (refer to Table 9-12)
3. Step 3: Evaluation of the significance (i.e. importance) of the effect, which is the product of a combination of the above two variables (refer to Table 9-13

9.5.34 Environmental effects are also classified as temporary for short term (occurring over a number of hours to 12 months), temporary for medium term (one to five years), temporary for long term (five to 15 years) or permanent (irreversible or reversible changes occurring over 15 years; refer to Table 9-12 for classification).

Assigning importance (for marine ecology) and vulnerability (for fisheries)

9.5.35 Ecological importance is determined with reference to:

1. Legal protection: level of designation (sites) or biodiversity-based protection (species and habitats)
2. Biodiversity value (e.g. rarity, scarcity, function within ecosystem, population trends)

9.5.36 The ecological importance of a feature is determined on a geographical scale, where the broader geographical context reflects an increased importance and/or sensitivity to change:

1. International importance
2. National (relating to the UK, specifically England) importance
3. Regional importance
4. County importance
5. Local importance

9.5.37 The geographical context for each important ecological receptor is determined on the basis of a variety of factors, for example, the quality or extent of designated sites or habitats; habitat/species rarity; the extent to which they are threatened throughout their range and their rate of decline.

9.5.38 The levels of ecological importance and the importance descriptors are presented in Table 9-10.

9.5.39 Fisheries are assigned a vulnerability based upon their relative limitations, sensitivity to changes in access and resource availability. These are presented in Table 9-11.

Table 9-10 Importance definitions for marine ecology

Importance	Definition (marine ecology)
Very high	Receptor is of international importance: Sites forming part of the Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR') marine protected area network or under the Emerald Network under the Bern convention (Sites of Community Importance (SCI); SPA; potential SPA; SAC; candidate SAC or proposed SAC) Wetlands of International Importance (Ramsar sites); Biogenetic Reserves; World Heritage Sites and Biosphere Reserves). Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. Resident, or regularly occurring, populations of species which may be considered at an international or European level where: • the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale • the population forms a critical part of a wider population at this scale • the species is at a critical phase of its life cycle at this scale
High	Receptor is of national importance: Designated sites (SSSI; non internationally listed MPA including MCZ; and National Nature Reserves (NNR)). Areas which meet the published selection criteria e.g. JNCC (1998) for those sites listed above but which are not themselves designated as such. Areas of key/priority habitats identified in the UK, including those published in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006) and those considered to be of principal importance for the conservation of biodiversity. Resident, or regularly occurring, populations of species which may be considered at a national level where: • the loss of these populations would adversely affect the conservation status or distribution of the species at this scale • the population forms a critical part of a wider population at this scale • the species is at a critical phase of its life cycle at this scale
Medium	Receptor is of regional/county importance: Areas of key/priority habitats identified; and areas of habitat identified in the appropriate Natural Area Profile (or equivalent). Resident, or regularly occurring, populations of species which may be considered at a regional/county level where: • the loss of these populations would adversely affect the conservation status or distribution of the species across the County or Unitary Authority Area • the population forms a critical part of a wider population at this scale • the species is at a critical phase of its life cycle at this scale
Low	Receptor is of local importance:

Importance	Definition (marine ecology)
	Areas of habitat; or populations/communities of species considered to appreciably enrich the habitat resource within the local context, including features of importance for migration, dispersal, or genetic exchange.

Table 9-11 Vulnerability definitions for fisheries

Vulnerability	Definition (fisheries)
Very high	Fishery limited in operational range and/or limited by gear or target species versatility. High dependence upon a single fishing ground.
High	Moderate extent of operational range and/or limited gear or target species versatility. Dependence upon a limited number of fishing grounds.
Medium	Extensive operational range and/or some gear or target species versatility. Ability to fish a number of fishing grounds.
Low	Extensive operational range and high gear or target species versatility. Vessels are able to exploit a large number of fishing grounds.

Assigning magnitude of impact

9.5.40 Table 9-12 provides the definitions for determining the magnitude of impact for both marine ecology and fisheries using CIEEM guidelines [32]. This has considered the following characteristics of environmental change:

1. Likelihood of the impact occurring
2. Positive or negative change:
   a. Positive – a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality, and this may also include halting or slowing an existing decline in the quality of the environment
   b. Negative – a change which reduces the quality of the environment e.g. destruction of habitat, removal of foraging habitat, habitat fragmentation, pollution
3. Extent – the spatial or geographical area over which the environmental change may occur
4. Scale – the size, amount, intensity or volume of the environmental change
5. Duration – the length of time over which the environmental change may occur and whether this is permanent or temporary
6. Frequency and timing – the number of times an environmental change may occur and the periods of the day, season or year during which an environmental change may occur, considering seasonal or life cycle constraints
7. Reversibility – whether the environmental change can be reversed through restoration actions or regeneration

9.5.41 For fisheries the magnitude of an impact is considered on an individual fleet basis as far as practicable and is defined taking account of the spatial and temporal extent of the impact. This is considered in the context of the relative level of importance to each fleet of the area affected by the potential effect (i.e. the level of

fishing in the area with reference to the extent of alternative grounds that the fleet is able to exploit).

9.5.42 The magnitude of the impacts scoped in (refer to Table 9-6) are described and assessed in section 9.8 taking into account primary and tertiary mitigation.

Table 9-12 Magnitude of impact definitions for marine biodiversity (comprising of marine ecology and fisheries)

Magnitude of impact on receptor	Definition (marine ecology)	Definition (fisheries)
Major adverse	Impact with serious consequences and/or on a large area (hundreds to thousands of hectares). Impact is considered to be permanent.	The area affected by the adverse impact excludes activities in an area that sustains high levels of activity by the fishery and covers a large or moderate extent of its grounds; and/or the impact is considered to be long-term (endures between 5-15 years) or permanent.
Moderate adverse	Impact with undesirable consequences and/or on a medium area (tens to hundreds of hectares). Impact is considered to be temporary (for a medium to long term).	The area affected by the adverse impact excludes activities in an area that sustains medium to high levels of activity by the fishery and covers a moderate extent of its grounds; and/or the impact is considered to be temporary (lasting for a medium term) lasting between one and five years.
Minor adverse	Discernible negative impacts and/or on a small area. Impact is considered to be temporary (for a short term).	The area affected by the adverse impact excludes activities in an area that sustains medium to low levels of activity by the fleet and covers a small extent of its grounds; and/or the impact is considered to be temporary (for a short term), enduring up to twelve months.
Negligible	No impact or no discernible impact. Impact is considered to be temporary (lasting for a number of hours).	The fleet in the impacted area has very little or no history of fishing in the area affected; and/or the impact is considered to be temporary (lasting for a number of hours).
Minor beneficial	Discernible positive impacts and/or on a small area. Impact is considered to be temporary (lasting for a number of days).	The area affected by the beneficial impact improves activities in an area that sustains medium to low levels of activity by the fleet and covers a small extent of its grounds; and/or the impact is considered to be temporary (lasting for a number of days).
Moderate beneficial	Impact with favourable consequences and/or on a medium area (tens to hundreds of hectares). Impact is considered to be temporary (lasting for a number of months).	The area affected by the beneficial impact improves activities in an area that sustains medium to high levels of activity by the fishery and covers a moderate extent of its grounds; and/or the impact is considered to be temporary (lasting for a number of months).
Major beneficial	Impact provides substantial gains and/or on a large area	The area affected by the beneficial impact improves activities in an area that sustains

Magnitude of impact on receptor	Definition (marine ecology)	Definition (fisheries)
	(hundreds to thousands of hectares). Impact is considered to be permanent (lasting for a number of years).	high levels of activity by the fishery and covers a large or moderate extent of its grounds; and/or the impact is considered to be permanent (lasting for a number of years).

Evaluation of significance of effects

9.5.43 The following significance matrix is used to assess the significance of potential effects arising from the Proposed Development for both marine ecology and fisheries which is in compliance with CIEEM guidelines [32]. Where a range of effects on a receptor is considered, existing guidance or published examples will be applied logically to assign the appropriate level of significance.

9.5.44 In section 9.8, for each receptor group scoped in, where a range of importance/vulnerability is present within the receptor group, a worst case scenario has been applied. The highest level of ecological importance in marine ecology receptors, or the highest vulnerability in fishery receptors, is assessed against the magnitude of impact to represent the highest potential level of effect significance.

Table 9-13 Significance matrix

		Magnitude of impact			
		Major	Moderate	Minor	Negligible
Importance/ Vulnerability of receptor	Very high	Major	Major	Moderate	Minor
	High	Major	Moderate	Minor	Minor
	Medium	Moderate	Minor	Minor	Neutral
	Low	Minor	Neutral	Neutral	Neutral

9.5.45 Any effect listed as ‘major’ or ‘moderate’ using the matrix (Table 9-13) is considered to be significant for the purposes of the EIA.

9.5.46 Where the assessment concludes that there would be no impacts on a receptor this is reported as no effect.

9.6 Assumptions and limitations

9.6.1 This section provides a description of the assumptions and limitations to the marine biodiversity assessment. Assumptions and limitations associated with the modelling approach of water streams of the WRP operation that are indirectly relevant to how the marine biodiversity receptors will be affected are described in section 19.6 of the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6).

Marine ecology

9.6.2 The baseline information for marine ecology has been informed using data accessed from data requests submitted to various groups and publicly available datasets, which may not be regularly updated (refer to section 9.7). Additional surveys to inform the baseline for marine ecology have been undertaken which provide up-to-date baseline information for the study area. However, the ecological surveys could be limited by factors which affect the presence of species, such as unexpected variations in time of year or migration patterns and behaviour. As a result, it is possible that some receptors have been missed within the surveys. This is a limitation faced by all survey methods and publicly available datasets so by using multiple sources of information and through technical engagement with stakeholders the risk of missing potential receptors is reduced. Results from the commissioned surveys (refer to section 9.7, paragraphs 9.7.32, 9.7.36, 9.7.40, 9.7.41, 9.7.50) have informed the assessment of likely significant effects and confirmation of the receptor list (ES Chapter 9 Appendices 9.2 to 9.11, Volume II).

9.6.3 In the Summer 2024 Consultation, the MMO had feedback on the lack of depth in the discussion of potential limitations associated with fish sampling methods. Therefore, limitations of the fish survey methodologies are supplemented as follows:

1. Fyke and seine nets are widely used for undertaking riverine and intertidal surveys and provide an appropriate survey methodology when compared to beam or otter trawls for targeting migratory fish species. However, there are limitations regarding the vulnerability of key fish receptors to these gear types when conducting migratory fish surveys. These limitations can impact the recorded presence, abundance, or absence of certain species, resulting in potential over/under representation of fish receptor species in the catch data.
2. Fyke nets are effective when used for inventory surveys where the objective is to estimate taxa richness or the presence/absence of fish species at a location, however they are considered a type of passive sampling gear. Therefore, the efficiency and selectivity of fyke nets is influenced both by the probability that fish will encounter, enter, and be retained within the net until it is retrieved, and the characteristics of the net itself, for example, mesh size, net dimensions, and the size of the mouth and funnel openings. Fyke net catches tend to be biased towards mobile benthic species and are less effective at capturing open-water species, however when set in shallower water, effectiveness at catching a broader range of species increases. Fyke nets are highly effective for capturing freshwater eels, particularly when baited. For this study the Dutch ‘D’ type fyke net (14mm mesh, 100cm height, 2 x 5.3m long, 1m leader) was used (see ES Appendix 9.2 Migratory fish survey report, Volume II (DCO Volume 6) for full method).
3. Seine nets are effective only if the specifications of the net are suitable for the conditions and species being targeted. The use of a seine net is biased towards catching small fish in shallow waters and the mesh size of the seine net may strongly influence the size of fish caught. The use of a seine net with a large (greater than 6mm) mesh size may preclude the capture of small species and the use of a small mesh size (less than 6mm) may slow hauling of a seine net such that fast-moving fish can avoid or escape the net. This survey used a seine net that had a mesh size of 6.5mm (see ES Appendix 9.2 Migratory fish

survey report, Volume II (DCO Volume 6) for full method). There is also an inherent risk of seine nets becoming snagged or torn on debris or rocks, resulting in failed survey attempts or escape by fast-moving species when untangling the net.

4. Seine nets are inefficient in more complex habitats or in rivers with certain substrates, for example, fish are more likely to escape under nets when substrate is uneven/irregular, e.g. cobbles. Benthic species, in particular smaller individuals and eels are difficult to capture as they escape under the lead and juvenile fish are more likely to suffer mortality in seine nets when compared to other sampling methods.
5. The use of a fyke net or seine net alone may not provide a representative sample of the local fish community due to these limitations, therefore the results of the fish survey (ES Appendix 9.2 Migratory fish survey report, Volume II (Document reference 6.2, DCO Volume 6)) have been supplemented with data gathered in desktop studies to provide representative information of the community structure.

Fisheries

9.6.4 It is possible that in the publicly available commercial fisheries data accessed, certain species may have been under-reported in relation to economic value and landed weight due to:

1. MMO landings data is derived from sales notes generated when fishermen sell their catch to a registered buyer or seller. Critically, the submission of sales notes is not required when catch is sold directly to the public, or for individual sales smaller than 25kg.
2. Fisheries derived data provided by the industry is often an estimation of weight based on box size and previous weight parameters for weight that each box can hold and is often underestimated.
3. Economic value and landed target species weight for each fishery has been expressed as an amalgamation of all vessel activity operating within each fishery within the study area. It has not been possible to determine the economic value and landed weight of each fishery for individual vessels in this study due to the granularity at which fisheries landings are reported and the sensitivity of reported data for individual vessel owners.
4. Analysis of the fleet operating in the study area using AIS fishing vessel surveillance provides a momentary view of activity occurring within the area and does not provide long-term trends in vessel presence.
5. Global Fishing Watch uses AIS data (refer to Table 9-9) as broadcast may vary in completeness, accuracy and quality. The Global Fishing Watch only captures data from vessels using vessel monitoring system (VMS), therefore does not cover vessels below 12m in length. Also, data collection by satellite or terrestrial receivers may introduce errors through missing or inaccurate data. Global Fishing Watch's fishing presence algorithm is a best effort mathematically to identify 'apparent fishing activity'. As a result, it is possible that some fishing activity is not identified as such by Global Fishing Watch; conversely, Global Fishing Watch may show apparent fishing activity where fishing is not actually taking place. For these reasons, Global Fishing Watch qualifies designations

of vessel fishing activity, including synonyms of the term 'fishing activity', such as 'fishing' or 'fishing effort' as 'apparent', rather than certain. Any/all Global Fishing Watch information about 'apparent fishing activity' should be considered an estimate.

9.6.5 The recreational fisheries data is limited by the absence of defined spatial reporting areas for recreational fisheries. There has been an assumption that the study area for commercial fisheries is also representative of the potential effects on charter fishing boats and shore-based recreational fishing.

9.6.6 These limitations are generally inherent to any fisheries assessment, though they have been reduced where possible by correlating with other available studies and validating findings through stakeholder engagement where feedback has been provided by stakeholders. These limitations do not affect the robustness of the assessment.

9.7 Baseline conditions

9.7.1 To provide an assessment of the likely significant effects of the Proposed Development (in terms of marine biodiversity), it is necessary to identify and understand the baseline conditions in the study area. This provides a reference point against which potential changes in marine biodiversity can be assessed.

Current baseline

9.7.2 This chapter considers the baseline conditions for receptors across the Proposed Development as a whole, as set out in ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6) rather than for each individual component of the Proposed Development.

Designated sites

9.7.3 This study identified 24 designated sites across both study areas. Details of these designated sites are outlined in ES Appendix 9.1 Designated sites identified within marine biodiversity study areas 1 and 2, Volume II (Document reference 6.2, DCO Volume 6).

9.7.4 There are 11 statutory designated sites present in study area 1. All of these statutory sites listed below also overlap into study area 2. These are:

1. Chichester and Langstone Harbours Ramsar site
2. Chichester and Langstone Harbours SPA
3. Solent and Dorset Coast SPA
4. Solent Maritime SAC
5. Solent and Isle of Wight Lagoons SAC
6. Langstone Harbour SSSI
7. Sinah Common SSSI
8. Hayling Billy LNR
9. West Hayling LNR
10. Farlington Marshes LNR

11. The Kench, Hayling Island LNR

9.7.5 Study area 2 has an additional 13 statutory designated sites comprising:

1. Solent and Southampton Water Ramsar site
2. Portsmouth Harbour Ramsar site
3. Solent and Southampton Water SPA
4. Portsmouth Harbour SPA
5. South Wight Maritime SAC
6. Chichester Harbour SSSI
7. Brading Marshes to St Helen's Ledges SSSI
8. Whitecliff Bay and Bembridge Ledges SSSI
9. Ryde Sands and Wootton Creek SSSI
10. Gilkicker Lagoon SSSI
11. Portsmouth Harbour SSSI
12. Bembridge MCZ
13. Sandy Point LNR

Marine mammals

9.7.6 The Solent is becoming increasingly important for harbour seals *Phoca vitulina* and grey seals *Halichoerus grypus* [55]. The closest known Seal haul-out sites comprise a site in Chichester Harbour and a site in Langstone Harbour, with more seals commonly found in Chichester Harbour. While only the Langstone Harbour haul-out site lies within study area 1, it is likely that seals from the Chichester Harbour haul-out site (which is located outside of the study area) would use areas covered by study area 2 which does extend into Chichester Harbour. The most recent information available for the study area reported that the counts of seals in Chichester and Langstone Harbours have increased from 23-25 harbour seals and two grey seals in 2009 to a maximum concurrent count of 47 harbour seals and 20 grey seals in 2019 [55]. The most recent Langstone Harbour counts indicated a maximum of seven harbour seals and two grey seals observed in 2019 [55]. Additional counts are provided by the Solent Seal Project which indicated the number of harbour seals is currently estimated at 23-25 with 18 being the most recorded at any one time [56], however, no date of this count was provided. If the seal count in Chichester and Langstone Harbours remains active [57], it is likely that the data has changed since then.

9.7.7 The Solent is a water body situated between the coast of Portsmouth, Southampton, and the Isle of Wight. The Eastney LSO is situated within the Solent and as a result, both study areas 1 and 2 include part of this water body. Harbour porpoise *Phocoena phocoena,* and bottlenose dolphin *Tursiops truncatus* are regularly recorded around the Solent, along with harbour seals. Occasional sightings of grey seal, killer whale *Orcinus orca*, minke whale *Balaenoptera acutorostrata* and short-beaked common dolphin *Delphinus delphis* have also been reported around the Solent. As these species typically have large territories, it is possible that they could be present within both study areas. All these species are protected under international conventions (Bern Convention, Convention on the Conservation of Migratory Species of Wild Animals (CMS), or Convention on

International Trade in Endangered Species of Wild Fauna and Flora (CITES)) and listed as European Protected Species. A list of the marine mammal species identified around the wider Solent area is presented in Table 9-14.

Table 9-14 List of marine mammals recorded around the Solent

Source	Species	Group size	Date identified	Location
ORCA [52]	Harbour porpoise	2	22 May 2018	Off Ventnor, Isle of Wight
	Harbour porpoise	1	28 April 2015	Off Ventnor, Isle of Wight
	Harbour porpoise	3	15 June 2023	Off Ventnor, Isle of Wight
	Harbour porpoise	3	9 October 2023	Off Ventnor, Isle of Wight
	Unidentified dolphin	2	27 September 2019	Off Bembridge, Isle of Wight
	Unidentified dolphin	6	27 May 2023	Off Bembridge, Isle of Wight
	Unidentified dolphin	4	6 August 2023	Off Bembridge, Isle of Wight
	Unidentified whale	1	22 June 2022	Off Ryde, Isle of Wight
	Bottlenose dolphin	10	21 August 2018	Off Sandown, Isle of Wight
	Bottlenose dolphin	8	24 April 2022	Selsey Bill
	Bottlenose dolphin	5	17 May 2022	Selsey Bill
	Bottlenose dolphin	5	5 September 2022	Selsey Bill
	Minke whale	1	8 April 2014	Off Ventnor, Isle of Wight
The Wildlife Trusts [53]	Bottlenose dolphin	Recorded but no details provided	Recorded but no details provided	Selsey Bill and the Hounds MCZ
Sea Watch Foundation [54]	Grey seal	1	5 October 2024	Keyhaven, Hampshire
	Grey seal	1	22 September 2024	River Test, Southampton
	Bottlenose dolphin	4	22 August 2024	Offshore Hurst Castle, Hampshire
	Common dolphin	3	29 July 2024	Lymington River
	Bottlenose dolphin	1	23 July 2024	Southampton Water
	Harbour porpoise	1	6 July 2024	Offshore, Hampshire

Source	Species	Group size	Date identified	Location
	Common dolphin	2	27 March 2024	Yarmouth, Isle of Wight
	Common dolphin	6	21 July 2023	Isle of Wight
	Dolphin species	2	17 June 2023	Solent, Hampshire
	Common dolphin	7	16 June 2023	Keyhaven, Hampshire
	Bottlenose dolphin	2	24 May 2023	East Wittering
	Common dolphin	8	25 January 2023	Chichester Harbour
	Bottlenose dolphin	10	20 September 2022	Isle of Wight
	Common dolphin	5	16 July 2022	Off Hill Head, Stubbington, Hampshire
	Long-finned pilot whale	10	14 July 2022	Selsey Bill
	Dolphin species	4	26 January 2022	St Catherine's Point, Isle of Wight

9.7.8 Environmental DNA (eDNA) sampling and analysis carried out around the Eastney LSO has recorded the common dolphin within the area (refer to ES Appendix 9.11 Eastney Log Sea Outfall environmental DNA sampling and analysis, Volume II (Document reference 6.2, DCO Volume 6)).

Fish

9.7.9 Various fish species have been recorded around the Solent and within Langstone and Chichester Harbours. This includes short-snouted seahorse *Hippocampus hippocampus* which is protected under Section 9 of the Wildlife and Countryside Act 1981 [1], a Section 41 species of principal importance in England [2] [58], and listed under OSPAR Commission's list of threatened and/or declining species.

9.7.10 A summary of fish species recorded by Sussex IFCA within Chichester Harbour from 2019 to 2021, including their conservation status/legislative driver for protection is presented in Table 9-15.

9.7.11 The Langstone Harbour Board, in collaboration with Southern IFCA and other partner organisations began surveying the small fish population in Langstone Harbour in 2012, with the aim of collating data that can be used to track and understand changes in the fish community over time. Three sites in the harbour were surveyed in June and September using seine nets and beam trawls with the methodology used mirroring that of the EA and Chichester Harbour Conservancy to ensure comparable results across all waterbodies. Surveys were undertaken between 2012 and 2017 and then again in 2023, with the hiatus in surveying between 2018 and 2022 attributed to limitations regarding COVID-19 restrictions.

A summary of fish species recorded in Langstone Harbour in 2012 to 2017 and 2023, including their conservation status/legislative driver for protection is presented in Table 9-16.

9.7.12 Within the wider Solent other species were noted by Cefas during their most recent European sea bass *Dicentrarchus labrax* survey [59] which have been included in Table 9-17.

9.7.13 A recent publication by Morrall et al. (2025) [60] studied the spatio-temporal variation of nearshore fish communities in estuaries across the Solent, including Langstone Harbour, using dataset of bi-annual seine net surveys between 2007 and 2018. It indicated that Langstone Harbour supported notable diversity of fish, and the Eastney Point survey site (at the southernmost tip of Langstone Harbour) had the highest fish abundance but assemblages at this location were dominated by marine stragglers[3] or species with weaker estuarine reliance [60]. This study suggested that fish diversity of the Solent is consistent with degraded estuarine and coastal systems, with estuarine fish communities typically composed of a few abundant, persistent species and support lower species richness than marine systems.

9.7.14 The Solent and Isle of Wight area is highlighted as a shark and ray hotspot, and providing pupping grounds for smooth hound *Mustelus mustelus*, tope *Galeorhinus galeus* and possibly thresher shark *Alopias* spp. [61]

Table 9-15 List of fish species recorded in Chichester Harbour by Sussex IFCA [46]

Common name	Species	Conservation status/legislation
European sea bass	*Dicentrarchus labrax*	The Minimum Conservation Reference Size (MCRS) for sea bass caught within the Southern IFC District is 42cm total length
Brill	*Scophthalmus rhombus*	Minimum landing size: 30cm under the Minimum Fish Sizes byelaw
Common goby	*Pomatoschistus microps*	None
Juvenile goby	*Pomatoschistus* spp.	None
Sand goby	*Pomatoschistus minutus*	None
Herring	*Clupea harengus*	Species of principal importance in England under Section 41 NERC Act 2006.
Golden grey mullet	*Chelon aurata*	None
Juvenile mullet	*Chelon* spp.	None
Thick lipped mullet	*Chelon labrosus*	None
Thin lipped mullet	*Chelon ramada*	None
Plaice	*Pleuronectes platessa*	Species of principal importance in England under Section 41 NERC Act 2006.
Greater sand eel	*Hyperoplus lanceolatus*	None
Sand smelt	*Atherina presbyter*	None
Sprat	*Sprattus sprattus*	None

[3] A group of individuals may become separated from the rest, often due to moving at a slower pace.

Table 9-16 List of fish species recorded in Langstone Harbour by Southern IFCA and Langstone Harbour Board [47] [48]

Common name	Species	Conservation status/legislation
European sea bass	*Dicentrarchus labrax*	The Minimum Conservation Reference Size (MCRS) for sea bass caught within the Southern IFCA District is 42cm total length
Ballan wrasse	*Labrus bergylta*	None
Black goby	*Gobius niger*	None
Black seabream	*Spondyliosoma cantharus*	MCZ Feature of Conservation Importance (FOCI)
Brill	*Scopthalmus rhombus*	Minimum landing size: 30cm under the Minimum Fish Sizes byelaw
Butterfish	*Pholis gunnellus*	None
Common goby	*Pomatoschistus microps*	None
Common sole	*Solea solea*	Species of principal importance in England under Section 41 NERC Act 2006.
Corkwing wrasse	*Symphodus melops*	None
Dab	*Limanda limanda*	None
Fifteen-spined stickleback	*Spinachia spinachia*	None
Five bearded rockling	*Ciliata mustela*	None
Flounder	*Platichthys flesus*	None
Garfish	*Belone belone*	None
Gilthead bream	*Sparus aurata*	None
Greater pipefish	*Syngnathus acus*	None
Greater sand eel	*Hyperoplus lanceolatus*	None
Grey mullet	*Liza aurata*	None
Herring	*Clupea harengus*	Species of principal importance in England under Section 41 NERC Act 2006.
Lesser sand eel	*Ammodytes tobianus*	None
Lesser weever	*Echiichythys vipera*	None
Long spine sea scorpion	*Taurulus bubalis*	None
Lumpsucker	*Cyclopterus lumpus*	None
Mackerel	*Scomber scombrus*	Species of principal importance in England under Section 41 NERC Act 2006.
Painted goby	*Pomatoschistus pictus*	None
Plaice	*Pleuronectes platessa*	Species of principal importance in England under Section 41 NERC Act 2006.

Common name	Species	Conservation status/legislation
Pollock	*Pollachius pollachius*	None
Pouting	*Trisopterus luscus*	None
Red mullet	*Mullus surmeletus*	None
Reticulated dragonet	*Callionymus reticulatus*	None
Sand goby	*Pomatoschistus minutus*	None
Sand smelt	*Atherina presbyter*	None
Shanny	*Lipophrys pholis*	None
Short spined sea scorpion	*Myoxocephalus scorpius*	None
Sprat	*Sprattus sprattus*	None
Snake pipefish	*Entelurus aequoreus*	None
Solenette	*Buglossidium luteum*	None
Tompot blenny	*Parablennius gattorugine*	None
Transparent goby	*Aphia minuta*	None
Tub gurnard	*Chelidonichthys lucema*	None
Two Spotted goby	*Gobisculus flavecens*	None
Worm pipefish	*Nerophis lumbriciformes*	None

Table 9-17 List of additional fish species recorded in the Solent by Cefas

Common name	Species	Conservation status/legislation
Baillion's wrasse	*Symphodus bailloni*	None
Ballan wrasse	*Labrus bergylta*	None
European sea bass	*Dicentrarchus labrax*	Bass below 42cm in size are protected from recreational fishing as stipulated in Bass Fishing Guidance 2025 [62]. Bass nursery areas are protected under The Bass (Specified Areas) (Prohibition of Fishing) (Variation) Order 1999. [63]
Black sea bream	*Spondyliosoma cantharus*	MCZ Feature of Conservation Importance (FOCI)
Corkwing wrasse	*Symphodus melops*	None
Clingfish	*Gobiesocidae*	None
Gilt-head bream	*Sparus auratus*	None
Greater pipefish	*Syngnathus acus*	None
Fifteen-spined stickleback	*Spinachia spinachia*	None
Five-bearded rockling	*Ciliata mustela*	None

Common name	Species	Conservation status/legislation
Horse mackerel	*Trachurus trachurus*	Species of principal importance in England under Section 41 NERC Act 2006.
Lesser sand eel	*Ammodytes tobianus*	None
Mackerel	*Scomber scombrus*	Species of principal importance in England under Section 41 NERC Act 2006.
Pouting	*Trisopterus luscus*	None
Rock goby	*Gobius pagnellus*	None
Snake pipefish	*Entelurus aequoreus*	None
Sole	*Solea solea*	Species of principal importance in England under Section 41 NERC Act 2006.
Spotted ray	*Raja montagui*	OSPAR threatened and/or declining species
Starry smooth hound	*Mustelus asterias*	None
Thornback ray	*Raja clavata*	OSPAR threatened and/or declining species
Transparent goby	*Aphia minuta*	None
Tub gurnard	*Chelidonichthys lucerna*	None
Undulate ray	*Raja undulata*	Species of principal importance in England under Section 41 NERC Act 2006.; MCZ FOCI; Endangered on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species
Whiting	*Merlangius merlangus*	Species of principal importance in England under Section 41 NERC Act 2006.

Migratory fish survey

9.7.15 Following engagement with the EA, marine migratory fish surveys have been carried out at the mouth of the Hermitage Stream (which is located at the northern end of Langstone Harbour within study area 1) and intertidal area of Langstone Harbour, to add to the baseline data already gathered to inform the EIA (refer to ES Appendix 9.2 Migratory fish surveys, Volume II (Document reference 6.2, DCO Volume 6)). These migratory fish surveys were undertaken using a variety of best practice techniques including netting and electrofishing. Surveys commenced in spring 2022, with additional surveys carried out in autumn 2022 and spring 2023.

9.7.16 The results show that the stream is highly modified with many structures present that would act as a barrier to the majority of migratory fish species and that there is very limited habitat available upstream that is suitable for fish spawning. Additionally, during summer months the water levels in the stream were less than 5cm in depth in some parts making it unsuitable for use by migratory species.

9.7.17 The survey recorded the following migratory species: European eel *Anguilla anguilla* (identified in both of the areas surveyed) and European smelt *Osmerus eperlanus* (identified in intertidal surveys of Langstone Harbour). The river has barriers that the European smelt cannot pass but European eels can and there is a lack of spawning substrate and supporting fry habitat for other migratory species.

European eel is listed in Appendix II of the CITES and the CMS, as well as Annex V of the OSPAR Convention for international protection.

9.7.18 Due to the timings of the surveys in spring (May – June) and autumn (September – October), the migration of adult smelt and part of the lamprey migration period has not been captured in these surveys; however, for the European smelt any presence of juveniles during the survey will be indicative that adults of the species have successfully migrated prior to the surveys period. European smelt congregate near river mouths in winter and typically move upstream between February and April, returning to the sea soon after spawning takes place [64]. Adult sea lamprey migrate upstream in the spring and early summer, spawning from May to July [65].

9.7.19 Fish habitat mapping was completed along the length of Hermitage Stream. Table 3-2 of ES Appendix 9.2 Migratory fish surveys, Volume II (Document reference 6.2, DCO Volume 6) presents an overview of habitats recorded during the habitat walkover survey and details the percentage cover of fish habitat types within Hermitage Stream. The survey stretch was dominated by habitat suitable for adult fish, comprising 54% of the area. This included Glide (48.7%), Torrent (4.2%), Riffle (0.6%), Run (0.5%), emergent macrophytes (0.1%, also offering juvenile shelter), and pools (<0.1%). In contrast, fry habitat accounted for only 1%, and the salmonid spawning habitat represented 0.4%, based solely on substrate suitability – a method that may over- or underestimate actual usable spawning areas. Even with improved fish passes, the river margins remain largely adult-oriented, with less than 1.4% of the surveyed area suitable for fry or spawning habitats.

9.7.20 The migratory fish survey report also included Langstone Harbour intertidal fish surveys (as presented in section 3.5 of ES Appendix 9.2 Migratory fish surveys, Volume II (Document reference 6.2, DCO Volume 6)). In the 2022 survey, a total of 1,912 fish were captured, primarily consisting of sea bass. The 2023 survey recorded 1,102 fish, with sea bass, sprat, and goby as the most abundant species, highlighting the harbour as an important nursery ground.

9.7.21 The surveys also noted herring and common sole in the area that are listed on the Section 41 species of principal importance in England (NERC Act 2006 [2]).

9.7.22 The Bullhead *Cottus gobio* was also recorded and is listed on the IUCN Red List of Threatened Species, Annex II of the European Commission Habitats Directive and SAC Annex II species at a number of sites [66]. It is a freshwater fish, and effects on it are therefore assessed in ES Chapter 8 Terrestrial and freshwater biodiversity, Volume I (Document reference 6.1, DCO Volume 6).

9.7.23 From the result of eDNA sampling and analysis carried out at the Eastney LSO, two of these protected species, the common sole and the bullhead, were recorded (refer to ES Appendix 9.11 Eastney Long Sea Outfall environmental DNA sampling and analysis, Volume II (Document reference 6.2, DCO Volume 6)).

Fish spawning and nursery grounds

9.7.24 Ellis et al. [41] provide an evidence-based understanding of the distribution of fish spawning and nursery grounds. Their report also covers other ecologically important fish habitats that are required to enable scientific advisors and regulators to better manage human activities in our seas. Ecologically important habitats for highly mobile marine fish can include sites of importance to breeding (i.e. mating sites, spawning beds, spawning grounds and parturition grounds), recruitment and

growth of early life-history stages (i.e. nursery grounds), as well as feeding grounds and migratory pathways.

9.7.25 Data on the distribution of the planktonic stages of fish eggs and larvae (ichthyoplankton) were collated by Ellis et al. [41] from numerous surveys conducted by Cefas and associated UK fisheries laboratories, and from internationally co-ordinated ichthyoplankton surveys. Based upon this data, Table 9-18 provides an overview of species that could potentially use study areas 1 and 2 as nursery and spawning areas. A number of the species identified are also commercially sensitive target species and these have been highlighted in the 'Notes' column of Table 9-18. One of these species, tope, is also a recreational fisheries species (see paragraphs 9.7.59 to 9.7.60).

9.7.26 In addition, Langstone Harbour (within study area 1) is a designated European sea bass nursery area under the Bass Order 1999 [63] so it provides a protected area for juvenile sea bass to grow. The result of eDNA sampling and analysis carried out at the Eastney LSO area also detected sea bass (ES Appendix 9.11 Eastney Long Sea Outfall environmental DNA sampling and analysis, Volume II (Document reference 6.2, DCO Volume 6)).

9.7.27 Sand eels are known to prefer to spawn in clean sands [67] and the lesser sand eel is a winter-spawning species [68]. The geophysical surveys (refer to ES Appendix 9.5 Subtidal geophysical survey and Appendix 9.10 Eastney Long Sea Outfall benthic ecology survey, Volume II (Document reference 6.2, DCO Volume 6)) interpreted areas of sublittoral sands and muddy sand habitat in Langstone Harbour (see paragraph 9.7.47) and identified subtidal sand sediment types within the Eastney LSO area (see Table 9-22) which are not a preferential spawning habitat of sand eels. From the result of eDNA sampling in winter and the subsequent analysis, no sand eels were detected around the Eastney LSO. Therefore, the likelihood of presence of sand eel or clean sands for spawning within the study areas is considered as low. An additional investigation on sand eel habitat suitability was conducted using a desk-based method provided in Reach et al. (2024) [69] to assess the broadscale habitats interpreted from geophysical data to yield more information on the possible presence/absence of sand eel and/or habitat suitable for sand eels within the Eastney LSO study area. The percentage of sand eel preferred habitat was calculated. It was found that in the 500m buffer area of the Eastney LSO most of the seabed sediment (96%) are unsuitable sand eel habitat, reflecting likely absence of habitat suitable for sand eels within the area influenced by the Eastney LSO.

9.7.28 The result of eDNA sampling and analysis (refer to ES Appendix 9.11 Eastney Long Sea Outfall environmental DNA sampling and analysis, Volume II (Document reference 6.2, DCO Volume 6)) potentially detected other fish spawning species including Clupeidae family (herring), Gadidae family (cod) and sole.

Table 9-18 Spawning and nursery grounds within the study areas 1 and 2 for fish species (Ellis et al. [41])

Species	Nursery/spawning grounds present	Notes
Tope shark *G. galeus*	Low intensity nursery grounds found within the study areas	Data limited for English Channel, although the Solent is often regarded as an important habitat for tope. Locations and temporal stability of specific parturition grounds are not well

Species	Nursery/spawning grounds present	Notes
		established. Data layer indicates nominal nursery grounds of tope, as indicated by the presence of juveniles.
Thornback ray *R. clavata*	Low intensity nursery grounds found within the study areas	Low intensity nursery grounds. Data layer indicates nominal nursery grounds of thornback ray, as indicated by the presence of juveniles. There are insufficient data on the occurrence of the egg cases or egg-bearing females in the spawning season with which to delineate spawning grounds, although these should broadly overlap with nursery grounds.
Spotted ray *R. montagui*	Low intensity nursery grounds found within the study areas	Low intensity nursery grounds. Data layer indicates nominal nursery grounds of spotted ray, as indicated by the presence of juveniles. There are insufficient data on the occurrence of the egg cases or egg-bearing females in the spawning season with which to delineate spawning grounds, although these should broadly overlap with nursery grounds.
Undulate ray *R. undulata*	Low intensity nursery grounds found within the study areas	Low intensity nursery grounds. Data layer indicates nominal nursery grounds of undulate ray, as indicated by the presence of juveniles. There are insufficient data on the occurrence of the egg cases or egg-bearing females in the spawning season with which to delineate spawning grounds, although these should broadly overlap with nursery grounds.
Herring *C. harengus*	Low intensity spawning grounds found within the study areas	High intensity herring spawning grounds identified further offshore and not within the study area. No nursery grounds were identified within the study area. Herring is a commercially sensitive target species, and requires gravel and similar habitats (e.g. coarse sand, maerl, shell) where there is a low proportion of fine sediment and well-oxygenated water for spawning. Under policy S-FISH-4-HE of the South Marine Plan [70], it is stated that 'proposals will consider herring spawning mitigation during the period 01 November to the last day of February annually'.
Cod *G. morhua*	Low intensity spawning grounds found within the study areas	Low intensity spawning grounds identified within the study area. No nursery grounds were identified within the study area.
Whiting *M. merlangus*	No spawning grounds Very low intensity nursery grounds found within the study areas	Whiting form part of the commercially sensitive target species for the study area. No spawning grounds were identified within the study area, however very low intensity nursery grounds were observed.

Species	Nursery/spawning grounds present	Notes
Horse mackerel *T. trachurus*	No spawning grounds No nursery grounds	Horse mackerel forms part of the annual commercial fisheries catch; however, no spawning or nursery grounds were identified in the study area.
Mackerel *S. scombrus*	Low intensity spawning grounds found within the study areas Low intensity nursery grounds found within the study areas	Mackerel form part of the commercially sensitive target species for the study area. Low intensity spawning grounds and nursery grounds were identified in the study area for the species.
Plaice *P. platessa*	Low intensity spawning area found within the study areas Low intensity nursery grounds found within the study areas	Low intensity spawning grounds were identified inshore of the study area, however high intensity spawning sites are located further offshore.
Sole *S. solea*	High intensity spawning grounds found within the study areas Low intensity nursery grounds found within the study areas	The study area was identified as a high intensity location for sole spawning and a low intensity nursery ground. A high abundance of larvae was sampled within the study area. Sole form part of the commercially sensitive target species for the study area.

Marine habitats

9.7.29 A desk study was carried out to identify different marine habitats within study areas 1 and 2, these habitats are outlined in Table 9-19.

Table 9-19 Marine habitats within study areas 1 and 2 gathered from desk study

Habitats	Description
Intertidal mudflats	The intertidal area adjacent to the Proposed Development is predominately characterised by extensive mudflats which support several species of macroinvertebrates. Intertidal mudflats provide an overwintering feeding ground for wintering wildfowl and waders (refer to the Brent Goose and Solent Wader Strategy [71]). Intertidal mudflats are also listed on the OSPAR list of Threatened and/or Declining Species and Habitats, Annex I listed habitat, and they are considered a habitat of principal importance in England [58].
Intertidal sandflats	These intertidal areas are submerged at high tide and exposed at low tide. They are present along the coastline of the Isle of Wight and also mainland Portsmouth (seaward side of Chichester, Langstone and Portsmouth Harbours). They form a major component of estuarine and large shallow inlets and bay habitats. This habitat can be categorised into three broad categories: clean sands, muddy sands and muds.
Coastal saltmarsh	Coastal saltmarsh is listed as a habitat of principal importance in England [58] and is considered to be present within the study area 1 (Langstone

Habitats	Description
	Harbour). Coastal saltmarsh is also recorded within study area 2 (Portsmouth Harbour and Chichester Harbour).
Intertidal eelgrass beds (seagrass)	Eelgrass beds comprised of both *Z. marina* and *Z. noltei* are found at various locations within the following designated sites: Solent Maritime SAC, Portsmouth Harbour SPA, Chichester and Langstone Harbours SPA and the Solent and Southampton Water SPA. These beds are a habitat of principal importance in England [58] and are also present near the Proposed Development.
Estuaries	The Proposed Development involves works within the terrestrial environment; however, some elements of noise and surface water discharge may occur near Langstone Harbour and in the Solent (east of the Isle of Wight). Both areas are connected to the Solent Estuary. The Solent Estuary is made up of a variety of habitats including; saltmarsh, maritime cliffs, sand dunes, saline lagoons, mudflats, vegetated shingle and coastal grazing marsh [72].
Subtidal benthic habitats	The subtidal benthic environment in the Solent area is generally characterised by subtidal soft sediments. This transitions into gravel and cobbles further from land. Areas of the benthic environment consists of various reefs including, chalk, rocky, limestone and sandstone reefs. Subtidal eelgrass beds, comprising *Z. marina* and *Z. noltei*, are located along the Isle of Wight between Cowes and Fishbourne. There are substantial areas of eelgrass beds within Portsmouth Harbour and Langstone and Chichester Harbour. These are important resources for several species of coastal bird species including waterfowl and waders (refer to the Brent Goose and Solent Wader Strategy [71]).

Seagrass

9.7.30 Seagrass beds in Langstone Harbour were identified using MAGIC [40] and these locations are outlined in Table 9-20. These seagrass habitats are known to be host to commercial species [73] and also species that are considered to be of conservation interest.

9.7.31 The EA identified Langstone Harbour as an area of seagrass potential due to the wave and current energy, elevation and salinity criteria. The Solent Seagrass Restoration Project [74], which aims to restore seagrass habitats to their historical levels across all locations in Langstone Harbour that are suitable for seagrass, is currently active in the harbour.

Table 9-20 Historic sites of seagrass in Langstone Harbour identified from MAGIC [40]

Site	Unique identifier	Size	Co-ordinates
North near Anchorage Park	NE_0444_26	92ha	SU68300299
Eight spots between Baker's Island and South Binness Island	NE_04NE_0444_18 NE_0444_19 NE_0444_20 NE_0444_21 NE_0444_22 NE_0444_23 NE_0444_24 NE_0444_2544_17	0.1ha 0.1ha 0.1ha 0.1ha 0.1ha 0.8ha 0.1ha 0.1ha	SU69560373 SU69600366 SU69630361 SU69660351 SU69760344 SU69720333 SU69700328 SU69580326

Site	Unique identifier	Size	Co-ordinates
Three spots west of Langstone Harbour along the Hayling Billy Trail on Hayling Island	D_00091___4 D_00091___3 NE_0449_308	0.1ha 0.3ha 26.7ha	SU70970189 SU71180174 SU71110137
Two spots south-west of Langstone Harbour near Sinah Warren Village and Leisure Club	D_00091___7 NE_0449__304	0.2ha 5.3ha	SU70250046 SU70240001

Source: MAGIC [40]

9.7.32 The Applicant commissioned specific habitat surveys to support the EIA. A seagrass survey was conducted in September 2022 (ES Appendix 9.3 Intertidal seagrass survey, Volume II (Document reference 6.2, DCO Volume 6)), to inform consents and licensing requirements for the Proposed Development. The survey covered the total area of Langstone Harbour, as defined by the Water Framework Directive waterbody outline [75]. The results identified seven seagrass beds; four within the north-west region covering a total area of 13ha, consisting of *Zostera noltei, Z. marina* or combinations of both species, and three *Z. noltei* beds within the south-east region covering a total area of 70ha (ES Figure 9.3 Seagrass beds in study areas, Volume III (Document reference 6.3, DCO Volume 6)) and ES Appendix 9.3 Intertidal seagrass survey, Volume II (Document reference 6.2, DCO Volume 6)). These beds were found to be in good condition with little browning and generally low macroalgae coverage, with the exception of a few areas in the north-west region.

9.7.33 Seagrass beds surveyed by the EA (2024) [76] and the National Seagrass Layer (Natural England, 2025) [77] have been included in this baseline. Environment Agency data showed mixed seagrass beds with the dominant species being *Zostera noltei* or *Z. noltei* and *Z. marina.* The National Seagrass Layer showed seagrass in the same areas as the EA survey, however, none was recorded within the north of Langstone Harbour. These were recorded as *Z. noltei* beds in littoral muddy sand. Locations of seagrass from both the EA Seagrass survey and the National Seagrass Layer are shown in ES Figure 9.3 Seagrass beds in study areas, Volume III (Document reference 6.3, DCO Volume 6).

9.7.34 A NE desk study of Solent and Isle of Wight intertidal seagrass noted that seagrass beds in the Solent have increased between 2019 and 2023. However, it was noted that there were large areas of 'mosaic' beds comprising smaller patches of seagrass bed, therefore some areas included sediment patches rather than a complete seagrass bed.

9.7.35 Overall, it is noted that there was no seagrass mapped along the northern part of Langstone Harbour around North Binness Island or Long Island where Hermitage Stream converges with Langstone Harbour.

Intertidal habitats

9.7.36 The Applicant commissioned an intertidal habitat survey which was conducted in September 2022 (ES Appendix 9.4 Intertidal survey results, Volume II (Document reference 6.2, DCO Volume 6)) to supplement the desk study. This survey covered the northern extremity of Langstone Harbour where the Hermitage Stream outputs

into the Brockhampton Mill Lake watercourse. The survey area extends approximately 1km southwards towards the North Binness Island and Long Island whilst spanning approximately 3km from Chalkdock Lake to the edge of Bridge Lake. This survey identified a total of five habitats in Langstone Harbour including approximately 31ha of saltmarsh, as summarised in Table 9-21 and indicated in ES Figure 9.4 Intertidal habitats mapped during the intertidal Phase I and Phase II survey, Volume III (Document reference 6.3, DCO Volume 6).

9.7.37 Within study area 1 habitats primarily consist of intertidal soft mud and mixed sediment, with areas of saltmarsh in the west and south-west and small, isolated saltmarsh patches along the north-west seawall of the Harbour (ES Appendix 9.4 Intertidal survey results, Volume II (Document reference 6.2, DCO Volume 6)). There were gravel and cobble along the west and subtidal sediments present (identified in site surveys and described below).

9.7.38 As part of this survey, samples were acquired in order to assess the intertidal infaunal community. A total of 61 taxa were recorded across nine sample stations. The most abundant taxon was *Nematoda* accounting for 78% of the total number of countable individuals, followed by the oligochaete *Tubificoides benedii* and the laver spire shell *Peringia ulvae* which accounted for approximately 6% of the total number of countable individuals each. Diversity indices calculated for sample replicates across stations indicated that biological diversity was highly variable.

9.7.39 From the intertidal surveys, no species of conservation importance were recorded. Several non-native species within the UK were recorded including the tube-building spionid polychaete *Pseudopolydora paucibranchiata*, the modest barnacle *Austrominius modestus*, the slipper limpet *Crepidula fornicata* and the sand gaper *Mya arenaria*. These non-native species are long-established in England (ES Appendix 9.4 Intertidal survey results, Volume II (Document reference 6.2, DCO Volume 6)).

9.7.40 An intertidal walkover survey of the Hermitage Stream section next to the WRP site (i.e. between Harts Farm Way and A27) was conducted in September 2024. A revetment (artificial hard structure) was located around the border of the Hermitage Stream along the length of the watercourse within the survey area. This revetment consisted of concrete blocks, with estuary wrack noted on parts of the structure. The walkover survey also identified the presence of intertidal mud, which has been channelled with concrete revetments either side of the river, as well as estuary wrack which is common in variable salinity habitats. Within this area numerous outfalls were noted and are expected to be surface water run-off. There was evidence of polychaetes in the area with lots of little holes in the littoral mud, which usually indicate a high level of bioturbation which can be mollusc, annelids or amphipods.

Table 9-21 Habitats found in Langstone Harbour and their descriptions

Broadscale habitat with EUNIS and JNCC code	Area (ha)	Habitat description during survey
Littoral mud A2.3 LS.LMu	91.2536	There was extensive coverage of this habitat across the central, western and eastern sections of the survey area. Habitat ranged from 0% to 100% coverage of green mat forming algae. Small number of empty bivalve shells noted on the surface. Mud was

Broadscale habitat with EUNIS and JNCC code	Area (ha)	Habitat description during survey
		often anoxic at very shallow sediment depths (0.1cm).
Fucus vesiculosus on mid eulittoral mixed substrata A1.3132 LR.LLR.F.Fves.X	37.4252	The habitat was mainly recorded in the north-eastern section of the survey area. Habitat occurred on substrate comprising of boulders, cobbles, gravel and mud. *F. vesiculosus* was observed, ranging from 30-60% coverage. *Ulva intestinalis* also observed in addition to small patches of *Fucus serratus*.
Littoral mud/ Littoral mixed sediment A2.3/A2.4 LS.LMu/LS.LMx	31.5579	The mosaic of habitats was observed to the north and north-eastern sections of the survey area. Mosaic habitat comprised of boulders, cobbles and gravel, interspersed by a high coverage of anoxic mud. Varying coverage of green mat forming algae. Hard substrata, where present, was frequently colonised by *Hymeniacidon perlevis.*
Coastal saltmarshes and saline reedbeds A2.5 LS.LMp.Sm	31.1519	This habitat was observed in the south, west and north-western areas of the Harbour. Large areas observed in the west and south-west, in addition to small, isolated patches (less than 0.0025ha) of saltmarsh observed along the north-west of the sea wall.
Ascophyllum nodosum on full salinity mid eulittoral mixed substrata A1.3142 LR.LLR.F.Asc.X	1.7548	This habitat covered the least extent of those recorded and was observed in the south-eastern area of the Harbour. Habitat comprised of *A. nodosum* and *F. vesiculosus* on boulders and cobbles.

Source: ES Appendix 9.4 Intertidal survey report, Volume II (Document reference 6.2, DCO Volume 6).

Subtidal habitats

9.7.41 Geophysical characterisation surveys were undertaken in May 2022 (refer to ES Appendix 9.5 Subtidal geophysical survey, Volume II (Document reference 6.2, DCO Volume 6)) and grab samples were taken from the seabed. This survey spanned Langstone Harbour, its approaches extended from Gilkicker Point near Portsmouth Harbour's approach channel across to Hayling Island's eastern edge within the Solent. The survey generally extended 1-3km from shore and was developed in consultation with the NE, EA and MMO in the Technical Working Group. As such the survey covers all vessel accessible areas within study area 1 and partially covers the northern extent of study area 2. Details on the achieved survey coverage are provided in ES Appendix 9.5 Subtidal geophysical survey, Volume II (Document reference 6.2, DCO Volume 6).

9.7.42 These surveys intended to access information to determine the presence of any broadscale features of conservation interest such as those listed on Annex I habitats under The Conservation of Habitats and Species Regulations 2017 [10], any listed under OSPAR Commission's list of threatened and/or declining species

or habitats and those considered under the Review of the MCZ features of conservation importance [78].

9.7.43 The subtidal area adjacent to Hayling island and across Eastney Beach to the eastern edge of Southsea common was relatively flat and shallow with maximum reported water depths of approximately 3.5m below Chart Datum (CD). In terms of larger scale features near the entrance to the Langstone Harbour next to western edge of Hayling Island, an intertidal sandbank was identified. This bank was likely formed by sediment transport out of the entrance channels to Langstone Harbour (in the west) and Chichester Harbour (in the east).

9.7.44 The entrance to Langstone Harbour comprised a deep channel with a maximum depth of 13.3m below CD in its centre which is approximately 200m wide at the harbour entrance though 400m at its widest observed point. The sides of this channel are relatively steep with a slope between 6-18% as they progress up toward the intertidal or wider approach areas which return to a generally flat area. This channel is not regularly dredged and is thought to be created by the high tidal flows.

9.7.45 Additional features include the approach channel to Portsmouth Harbour which has depths observed between 15m and 18m below CD. To the west of the Portsmouth channel the seabed similarly shoaled as the other nearshore areas to approximately 3-4m CD. However, it was apparent that depths rapidly increased approximately 0.5km south of Gilkicker Point to maximum depths of approximately 20m below CD.

9.7.46 Sidescan sonar data indicated that sediments comprise mud and fine sand, with discrete areas of coarser mixed material. Areas of megaripples, likely associated with the high current flows of the channel, interpreted though other indeterminate bedforms were apparent. Outside of Langstone Harbour, sediments were fairly uniform and likely to consist of mixed sediments comprising varying degrees of mud, sand and fine gravel. Various bedforms were interpreted including a megarippled sand area primarily south of Hayling island and smaller areas of megarippled mixed coarse sediment near Portsmouth Harbour. Other bedforms were less distinct, although areas of cobbles were interpreted south of Eastney Beach, and an area of anchor scars interpreted nearby Portsmouth Harbour.

9.7.47 This survey mapped different habitats including sublittoral coarse sediment, sublittoral sands and muddy sand, sublittoral mixed sediments and sublittoral cohesive mud and sandy mud communities at Level 3 under JNCC Marine Habitat Classification for Britain and Ireland [27]. These habitats are indicated in ES Figure 9.5 Habitat mosaic surveyed by sidescan sonar across Langstone Harbour, south of Hayling Island and south of Eastney, Volume III (Document reference 6.3, DCO Volume 6)

9.7.48 A total of 29 stations were sampled for particle size analysis and 24 stations for faunal analysis distributed across the geophysical survey area to represent the predicted habitat types. Particle size analysis revealed that the majority of samples (11) were dominated by gravel size particles, although mud size particles were dominant in five samples. The muddier areas were within northern part of Langstone Harbour or in the deep waters near Gilkicker Point.

9.7.49 The sampling stations were biologically diverse with a good representation of annelids, crustacea, molluscs and "*other non-countable*" taxa. A number of species

that are considered rare, or that are component parts of priority habitats, were recorded across the survey area. *Epistomia bursaria* was recorded and is listed as a nationally rare species by the JNCC. In addition, two individuals of *Maxmuelleria lankesteri* were noted at one station with supporting community most closely representative of the biotope "*Burrowing megafauna Maxmuelleria lankesteri in circalittoral mud*" (A5.362), which can be a component part of the priority habitat "*Mud habitats in deep water*". *Sabelleria spinulosa* was identified, but not in sufficient numbers to be reef forming.

9.7.50 Benthic surveys to investigate the habitats that would be present around the Eastney LSO, and establish existing water quality around those habitats, were commissioned by the Applicant. These surveys started in October 2023 and were completed in 2024. Results of these surveys (ES Appendix 9.10 Eastney Long Sea Outfall benthic ecology survey, Volume II (Document reference 6.2, DCO Volume 6) and Appendix 9.11 Eastney Long Sea Outfall environmental DNA sampling and analysis, Volume II (Document reference 6.2, DCO Volume 6)) indicate that a habitat of principal importance in England (subtidal sands and gravels) and some FOCI of Bembridge MCZ (including subtidal sand, subtidal mud and subtidal mixed sediments) were observed, but no Annex I reefs were observed within the area. Habitats recorded are detailed in Table 9-22. Benthic habitats around the Eastney LSO are indicated in ES Figure 9.6 Habitat mapping across the Eastney Long Sea Outfall survey area, Volume III (Document reference 6.3, DCO Volume 6).

9.7.51 Subtidal benthic species in the Eastney LSO area potentially include peacock's tail *Padina pavonica*, a feature of conservation importance. However, this is not present in the benthic surveys completed around the Eastney LSO (refer to ES Appendix 9.10 Eastney Long Sea Outfall benthic ecology survey, Volume II (Document reference 6.2, DCO Volume 6) and ES Appendix 9.11 Eastney Long Sea Outfall environmental DNA sampling and analysis, Volume II (Document reference 6.2, DCO Volume 6)).

9.7.52 It was also noted in the benthic survey that the INNS slipper limpet *Crepidula fornicata* was present across the area.

Table 9-22 Habitats recorded during the Eastney LSO benthic habitat survey

BSH	Habitat/Biotope	Description
A5.2 – Subtidal Sand	A5.24	Infralittoral muddy sand
	A5.26	Circalittoral muddy sand
A5.3 – Sublittoral mud	A5.33	Infralittoral sandy mud
	A5.335	*Ampelisca* spp., *Photis longicaudata* and other tube-building amphipods and polychaetes in infralittoral sandy mud
	A5.35	Circalittoral sandy mud
A5.4 – Subtidal Mixed Sediment	A5.43	Infralittoral mixed sediments
	A5.431	*Crepidula fornicata* with ascidians and anemones on infralittoral coarse mixed sediment

BSH	Habitat/Biotope	Description
	A5.44	Circalittoral mixed sediments

Benthic marine species

9.7.53 The subtidal benthic environment supports a diverse variety of species. The public Marine Recorder snapshot [79] informed the benthic species likely to be present in the two study areas and the Diver's Guide to Marine Life of Britain and Ireland [29] has been used to compliment this information. The book determines UK distribution based on 'common', 'occasional', 'rare' and 'absence' of species observed during dives whilst the Marine Recorder snapshot lists species that are 'superabundant', 'abundant', 'common', 'occasional' and 'rare'. Examples of species identified within study area 2 (which encompasses study area 1 as well) as 'common' or above have been included within Table 9-23. The list is not exhaustive as there are numerous species present under each species group. A more complete list of species present can be found in the book mentioned above.

Table 9-23 Benthic marine species within study area 2 gathered from desk study

Species group	Phylum	Example species
Sponges	Porifera	Purse sponge *Sycon ciliatum* Sea orange *Suberites ficus* Shredded carrot sponge *Amphilectus fucorum*
Hydroids, anemones	Cnidaria	Oaten pipe hydroid *Tubularia indivisa* Antenna hydroid *Nemertesia antennina* Dead men's fingers *Alcyonium digitatum* Sandalled anemone *Actinothoe sphyrodeta*
Worms	Platyhelminthes, Nemertea and Annelida	Sand mason worm *Lanice conchilega*
Crabs, lobster and prawns	Crustacea	Lobsters *Homarus gammarus* Common shore crabs *Carcinus maernis* Common hermit crab *Pagarus bernhardus*
Sea shells, sea snails and clams	Mollusca	Whelks *Buccinum undatum* Grey topshell *Gibbula cineraria* Flat topshell *Gibbula umbilicalis* Scallops *Pectinidae spp.* Common periwinkle *Littorina littorea*
Sea mats and sea moss	Bryozoa	Spiral bryozoans *Bugula* spp. Frosty sea mat *Electra pilosa* Hornwrack *Flustra foliacea*
Starfish, sea urchins and sea cucumbers	Echinodermata	Common starfish *Asterias rubens* Sand brittlestar *Ophiua ophiura*
Sea squirts	Tunicata	Star sea squirt *Botryllus schlosseri* Leathery sea squirt *Styela clava*
Fish	Pisces	Thornback ray *Raja clavata* Spotted ray *Raja montagui*

Species group	Phylum	Example species
		Undulate ray *Raja undulata* Plaice *Pleuronectes platessa* Sole *Solea solea* Rock goby *Gobius pagnellus* Lesser sand eel *Ammodytes tobianus* Snake pipefish *Entelurus aequoreus*
Sea weeds and seagrasses	Algae and Angiosperms	Eelgrass *Zostera marina* Dwarf eelgrass *Zostera noltei* Sugar kelp *Saccharina latissima* Sea lettuce *Ulva lactuca* Discoid fork weed *Polyides rotunda*

9.7.54 The subtidal survey noted a variety of species within Langstone Harbour (refer to ES Appendix 9.6 Subtidal grab sampling report, Volume II) (Document reference 6.2, DCO Volume 6). The three most abundant taxons sampled were (in descending order) the baked bean ascidian *Dendrodoa grossular*, the oligochaete *Tubificoides benedii* and the polychaete *Aphelochaeta marioni* (sensu MarLIN). The intertidal area included low levels of the common cockle (*Cerastoderma edule*) which is a commercially important species and also noted the presence of amphipod *Melita palmata* as the most abundant crustacean.

9.7.55 In a review of Natural England's published distribution of MCZ species features of conservation importance, 12 benthic species are anticipated within the study area [80]. Four of these are fish species, some of which are mentioned in Table 9-23 above. These are provided in Table 9-24.

Table 9-24 Benthic species that are features of conservation importance within study areas

Common name	Scientific name
Black seabream	*Spondyliosoma cantharus*
European eel	*Anguilla anguilla*
European smelt	*Osmerus eperlanus*
Lagoon sand shrimp	*Gammarus insensibilis*
Lagoon snail	*Paludinella littorina*
Maerl	*Phymatolithon calcareum*
Peacock's tail	*Padina pavonica*
Stalked jellyfish	*Calvadosia campanulata*
Stalked jellyfishes	*Haliclystus species*
Starlet sea anemone	*Nematostella vectensis*
Tentacled lagoon worm	*Alkmaria romijni*
Undulate ray	*Raja undulata*

Fisheries

Recreational fisheries

9.7.56 Langstone Harbour is an important location for charter fishing boats, providing suitable access for sea angling trips into the Solent and wider coastal area, and as a designated European sea bass nursery area under the Bass Order 1999 [63]. Bass is one of several primary species targeted by recreational sea anglers from both the shore and boats.

9.7.57 The Southern IFCA District stretches from the Devon/Dorset border in the west across to the Hampshire/Sussex border in the east. This district is recognised as a nationally significant area for recreational sea angling. This is due to the broad diversity of features, habitats and fish species found within the estuaries and coastal areas across the district.

9.7.58 The district is supported by good boat access provided by sheltered moorings in areas around the Solent Waters. Offshore angling is facilitated by privately owned vessels, angling club boats and numerous professional charter angling boats. The sport is widespread across the area, particularly in the summer months, with the charter angling vessels operating out of Poole Harbour and Weymouth Bay which utilise fishing grounds within study areas 1 and 2.

9.7.59 Shore anglers visit popular spots such as Chesil Beach, Sandbanks, Eastney, Bournemouth, Boscombe and Southsea Piers, with marinas, cliffs and harbour walls also being important. Anglers use rod and line to target a wide variety of fish species, with primary catches consisting of sea bass, black seabream, pollack, squid and flatfish. However, a wide range of species are targeted, including tope.

9.7.60 The Sussex IFCA District stretches from the Hampshire/Sussex border in the west across to the Kent and Essex border in the east. This district also contains a broad diversity of features and habitats and diverse assemblage of fish species found within the estuaries and coastal areas, which support a significant number of recreational fisheries that are fished both from shore and from numerous charter boats operating within the area. Primary recreational target species within the area include black seabream, tope, and sea bass. Portsmouth, Langstone and Chichester Harbours and the surrounding coastline support an active fleet of charter boats and shore fishermen.

9.7.61 Whilst commercial fisheries landings statistics are reported annually by the MMO, recording and reporting methods for recreational fisheries are still widely undeveloped to provide annual data on catch, effort and target species. Information provided within the baseline study includes anecdotal reporting from the IFCAs [45] [46], Harbour Conservancy Boards [48] and recreational fishing and charter boat online sources [81] to identify the key species targeted within these fisheries. Each of the recreational target species identified have also been included within the Marine Ecology section of this baseline for study area 1.

9.7.62 The MMO1163 Mapping Sea Angling project [81] provides insights into the spatial distribution of recreational sea angling in England. The research was commissioned to support the development and implementation of marine plan policies, and to assist the MMO and IFCAs to manage impacts on MPAs and users of the marine environment. The report utilises the ‘data mining’ methodology, whereby all relevant data held within online text is extracted to provide spatio-

temporal data from which to understand recreational fisheries. This provides an overview of important target species within the study area and the level of shoreline fishing activity undertaken [81]. Trends in this data are shown Table 9-25.

Table 9-25 Recreational fisheries trends near to study areas 1 and 2

Location	High/Medium/ Low Shore Activity	Charter boat species catches ranking[4]					
		Cod	Sea bass	Skates and Ray	Flatfish	Bream	Sharks
Southampton Waters (Study area 1)	Medium – High	0	0	0	0	0	0
Portsmouth Harbour (partially within Study area 2)	Medium – High	24	6	27	18	8	23
Langstone Harbour (Study area 1)	Medium – High	39	25	43	34	21	29
Chichester Harbour (partially within Study area 2)	Medium – High	4	8	17	8	11	14

Commercial fisheries

9.7.63 The following section characterises the fishing fleet operating within the study area and the commercially sensitive target species fished. This is to provide a baseline of receptors and allow consideration of potential impacts that could arise from the Proposed Development.

9.7.64 For the purpose of this study, commercial fishing is defined as any fishing activity undertaken by licenced fishing vessels for the legitimate capture and sale of fish and shellfish. Publicly available information from MMO landing statistics [82] and AIS fishing vessel surveillance results have been used to inform this section. Landings and economic value data have been accessed from MMO fisheries landings statistics to describe current activity within each fishery.

9.7.65 Commercial fisheries operating within Langstone harbour include a range of activities regulated under Southern IFCA byelaws and permit systems. These include net fisheries targeting finfish species managed under the Southern IFCA Net Fishing Byelaw (quoted from Southern IFCA Summer 2024 Consultation Response), as well as shore gathering for shellfish species and bait worms, which is subject to both Southern IFCA regulations and wider codes of conduct [83]. Additionally, a dredge fishery operates for bivalve species including King scallop *Pecten maximus*, Manila clam *Ruditapes philippinarum*, native clam *Ruditapes decussatus* and common cockle *Cerastoderma edule*, managed under the Southern IFCA Solent Dredge Permit system.

9.7.66 In addition, both recreational and commercial rod and line activity occur in the Harbour. Commercial rod and line activity targets a variety of species, including European sea bass (*Dicentrarchus labrax*), and occurs both within and outside of

[4] Values are described by MMO1163 project [81] as a "proxy indicator of relative shore marine angling activity expressed as a 3-bin quantile rank, aggregated by species and a 2-bin season (Winter: October to March; Summer: April to September). The rank was calculated from the co-occurrence of named spatial locations with words indicative of an angling trip and the month or season in which the activity occurred in. The co-occurrence sum approximates to trip count. Data was aggregated to the nearest-neighbour intertidal polygon)". Consequently, higher values indicate greater importance of that species for recreational use.

the designated bass nursery area. Langstone Harbour is classified as a sea bass nursery area under national legislation, i.e. the Bass (Specified Areas) (Prohibition of Fishing) (Variation) Order 1999 [63], and is managed under the Southern IFCA, meaning that fishing for bass from vessels is prohibited between 30 April and 1 November each year to protect juvenile bass populations. Commercial and recreational sea bass fishing is therefore only permitted outside of this seasonal closure period, in accordance with national and regional conservation measures.

9.7.67 The area in which the LSO occurs hosts a number of fishing activities spanning both commercial and recreational sectors and a variety of gear types. This includes a dredge fishery for King scallop (*Pecten maximus*), pot fishing for whelk *Buccinum undatum* and cuttlefish (*Sepia officinalis*), trawling for plaice, skate and ray species, static net fishing for sole and sea bass primarily and rod and line fishing (both commercial and recreational) for a variety of fish species.

Commercial fishing fleet

9.7.68 The fishing fleet operating within the study area can generally be separated by vessel category in relation to size. Vessels 10m and under are considered to form the inshore fleet. These vessels generally have less range and fishing capability than larger vessels and fish inshore waters with a return to port each day. Vessels over 10m are generally considered to have the capability to fish further afield, with larger engine capacities, more deck space for storage of gear and processing of catch and the capability to fish over several days when needed.

9.7.69 The predominant fleet operating within the study area consists of inshore vessels, 10m and under in length with primary fishing grounds located closer to shore (corroborated by recent AIS data observations [50]). Whilst a number of these vessels will have multipurpose capabilities, being able to deploy pots, trawls nets and/or lines, given their small size and associated limited operational ranges, they will be unable to utilise fishing grounds further afield.

Spatial distribution of commercial fishing activity

9.7.70 MMO UK fisheries statistics, published annually by the government, provide data on annual landings figures by fishery for the 10m and under and the over 10m vessel categories [82]. However, they do not provide information on fishing effort in terms of spatial distribution of activity. Legislation involving new licence condition requirements came into force on 12 May 2025 which makes it a legal requirement for all vessels under 12m in length to have a type-approved inshore vessel monitoring system (I-VMS) device installed and transmitting data to the MMO when they are at sea in English waters. This is part of the Government's strategy to improve data collection to support development of more responsive fisheries management measures and practices that will enable industry to benefit from leaving the Common Fisheries Policy. I-VMS is similar to VMS tracking devices utilised by fishing vessels 12m and greater in overall length. It provides positional information such as latitude and longitude, course, speed and date and time of each positional report. However, as it is still in early stage of data collection this MMO data on spatial distribution of fishing effort is not available for use in this assessment.

9.7.71 Global Fishing Watch uses data about a vessel's identity, type, location, speed, direction and more that is broadcast using the global AIS. This information is collected via satellites and terrestrial receivers in near real-time based on global AIS and VMS data. Global Fishing Watch analyses AIS data collected from vessels that research has identified as known or possible commercial fishing vessels and applies a fishing presence algorithm to determine "*apparent fishing activity*" based on changes in vessel speed and direction. The algorithm classifies each AIS broadcast data point for these vessels as either apparently fishing or not fishing and shows the former on the Global Fishing Watch fishing activity heat map.

9.7.72 Fishing activity (type of gear deployed) and effort intensity (hours fishing) trends have been observed between 2018-2023 using Global Fishing Watch, providing a five-year dataset of spatial and temporal fisheries distribution within the study area. The results of this analysis are displayed as a heat map; these are described in Table 9-26 and visually displayed in ES Appendix 9.7 Spatial distribution of fisheries effort, Volume II (Document reference 6.2, DCO Volume 6). The lighter the blue pixels on the map indicate the more fishing activity taking place.

Table 9-26 Fishing methods identified through Global Fishing Watch within and adjacent to the study area

Fishing method	Takes place within study area 1 and 2 (Y/N)	Takes place immediately adjacent to study area 1 and 2 (Y/N)
Dredge fishing	Y	Y
Drifting longlines	Y	Y
Pole and line	Y	Y
Pots and traps	Y	Y
Fixed gear - Set gillnets	Y	Y
Fixed gear - Set longlines	N	Y
Trawl fishing	Y	Y

Commercial fishing ports

9.7.73 Langstone Harbour has a small fleet of commercial fishing vessels that land catch at two wharves. Fishing vessels moor and unload at Locke Lake on Ferry Road at the entrance to the Harbour. Hermitage Stream is very shallow and heavily modified with no provision for mooring fishing boats or landing catch. Depth limitations restrict access and manoeuvrability of fishing vessels within the waterbody (refer to ES Chapter 5 EIA approach and methodology, Volume I (Document reference 6.1, DCO Volume 6)); therefore, no interaction is anticipated between fishing vessels and the proposed construction works at Hermitage Stream. Chichester Harbour has a small fleet of inshore fishing vessels that operate from the Harbour, often fishing in the wider Solent. Portsmouth Harbour has berths at The Camber in Old Portsmouth, primarily used by the City's fishing fleet.

Commercially sensitive species

9.7.74 A substantial difference in landed weight and economic value of target species between the 10m in length and under, and the over 10m in length fishing fleets is

broadly evident across the data reporting period. This indicates there is an increased reliance of the inshore fleet on fishing grounds within ICES rectangle 30E8 in which study area 2 is located (refer to Table 9-27).

Table 9-27 Average economic value (£) and landed weight (tonnes) of the 10m and under and over 10m fishing fleets operating within study area 2 between 2019 and 2023

ICES rectangle	Year	Average economic value (£)		Average landings (tonnes)	
		10m and under	Over 10m	10m and under	Over 10m
30E8	2019	3,584,768	409,183	1,063	184
	2020	2,975,477	625,239	1,093	292
	2021	3,570,582	711,714	1,045	299
	2022	3,710,346	638,121	909	232
	2023	4,557,819	1,044,145	1,190	394
	5-year average	3,679,798	685,680	1,060	280
30E9	2018	3,275,987	2,387,205	1,364	1,438
	2019	2,835,098	2,273,978	1,466	1,555
	2020	3,411,012	2,486,146	1,540	1,745
	2021	3,823,829	1,456,098	1,621	762
	2022	3,600,621	1,751,275	1,574	958
	5-year average	3,389,309	2,070,940	1,513	1,292

Source: MMO, [84]

9.7.75 Table 9-28 identifies commercially sensitive species fished in each of the ICES rectangles across the latest data reporting period of 2019–2023 (the latest published source). The table includes species that have been identified as important commercial catch for each rectangle based on the annual value (£) of the fishery and the landed weight (tonnes) fished each year. The ecology of each of the target species identified with regard to sensitivities to water quality changes is provided in ES Appendix 9.8 Ecology of fishery target species, Volume II (Document reference 6.2, DCO Volume 6).

Table 9-28 Summary of commercially sensitive target species in the data reporting period of 2019 and 2023

ICES statistical rectangle	Top ten annual economic value (£)	Top ten annual landed catch (tonnes)
30E8	Manila clam *R. philippinarum* Sole *S. solea* Whelks *B. undatum* Lobsters *H. gammarus* Brown/edible crabs *C. pagurus* European sea bass *D. labrax* Cuttlefish *S. officinalis* Scallops *Pectinidae* spp. Plaice *P. platessa* Mullet *Mugilidae* spp.	Whelks *B. undatum* Manila clam *R. philippinarum* Brown/edible crabs Scallops *Pectinidae* spp. Cuttlefish *S. officinalis* Sole *S. solea* Plaice *P. platessa* European sea bass *D. labrax* Mullet *Mugilidae* spp. Common cockles *C.edule*
30E9	Whelks *B. undatum*	Whelks *B. undatum*

ICES statistical rectangle	Top ten annual economic value (£)	Top ten annual landed catch (tonnes)
	Scallops *Pectinidae* spp. Sole *S. solea* European sea bass *D. labrax* Lobsters *H. gammarus* Brown/edible crabs *C. pagurus* Horse mackerel *T. trachurus* Plaice *P. platessa* Cuttlefish *S. officinalis* Manila clam *R. philippinarum*	Scallops *Pectinidae* spp. Horse mackerel *T. trachurus* Plaice *P. platessa* Brown/edible crabs Sole *S. solea* Cuttlefish *S. officinalis* European sea bass *D. labrax* Lesser spotted dog *S. canicula* Herring *C. harengus*

Bivalve mollusc production areas

9.7.76 Langstone Harbour (study area 1), Portsmouth Harbour and the Solent Southampton Waters (study area 2) have all been identified as classified shellfish production beds within and/or adjacent to some of the study areas. Bivalve mollusc (shellfish) harvesting areas are classified according to the extent of microbial (faecal) contamination as shown by monitoring of *Escherichia coli* in shellfish flesh. The following species were identified as being target species of these classified beds:

1. European oyster *Ostrea edulis*
2. Pacific oyster *Crassostrea gigas*
3. Hard clam *Mercenaria* spp.
4. Manila clam *Ruditapes philippinarum*
5. Common cockle *Cerastoderma edule*

9.7.77 The areas delineated within the charts provided in ES Appendix 9.9 Bivalve mollusc production areas, Volume II (Document reference 6.2, DCO Volume 6) are those classified as bivalve mollusc production areas under Regulation (EU) 2019/627.

Future baseline

9.7.78 A description of the anticipated changes in future baseline conditions for marine biodiversity has been carried out and is described within this section. Consideration of committed developments that will be delivered prior to commencement of construction have been identified in ES Chapter 20 Cumulative and in-combination effects, Volume I (Document reference 6.1, DCO Volume 6).

9.7.79 The management approach shown in the Shoreline Management Plan for the northern side of Langstone harbour [14] is "*Hold the line*" until 2105. Therefore, current coastal defences and managed beaches will be retained and replaced when needed. For the future baseline conditions, it is unlikely that the shoreline will recede or be reclaimed.

9.7.80 The Solent Forum's Three Harbours Project has presented a strategy for restoration of habitats in Langstone Harbour [85]. The Solent Native Oyster Restoration project [86] which aims to restore native oyster to Langstone Harbour

would alter the ecological baseline by adding native oyster beds, therefore this is considered as part of the future baseline for this assessment.

9.7.81 The Blue Marine Foundation alongside the Wildlife Trusts are carrying out the Solent Seascape Project to restore seagrass meadows, oyster reefs, saltmarsh and seabird nesting habitat. The Solent Seascape Project has been in progress for four years, starting in 2021 with the first oyster reef being built, therefore this is considered as part of the future baseline for this assessment. The restoration will be monitoring the wider benefits including carbon sequestration, nutrient remediation and connectivity between habitats. Restoring these habitats will provide nature-based solutions to current issues including water quality and help to mitigate the impacts of climate change [87].

9.7.82 A development from the shortlist of committed developments is Portsmouth Water's consented development for a new pipeline for water transfer from Bedhampton Springs to Havant Thicket reservoir (refer to paragraph 9.5.9). There are plans by Portsmouth Water to undertake improvements on Hermitage Stream as part of the Havant Thicket Reservoir project[5]. Following additional engagement with Portsmouth Water (see section 19.7 of ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6)) it was established that the programme of enhancements to Hermitage Stream would be limited to Upper Hermitage Stream at The Queen's Inclosure and the section from Bushy Lease to New Road, but not the intertidal section of Hermitage Stream. Therefore, this future baseline has been covered in ES Chapter 8 Terrestrial and aquatic biodiversity and Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6) and has not been considered again here.

9.7.83 The baseline in the future may be impacted by climate change that cause precipitation changes and sea level rise (as projected in ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6)) and a potential increase in human population may lead to an increase in discharge and wastewater (e.g. from more households and business; storm overflow discharge increases and more pressure to sewer systems [88]). This increase may lead to changes in water quality and also potential changes in the value and vulnerability of marine biodiversity receptors in the future, although this may be beyond the expected operational life of the Proposed Development.

9.7.84 Changes in atmospheric CO_2 have led to environmental changes in the ocean, most notably an increase in temperature and an increase in the acidity of the ocean. Temperatures within the ocean have increased by approximately 0.13°C per decade over the past hundred years [89], leading to redistribution in marine species poleward or into deeper waters [90]. These long-term shifts in distribution are linked to directional shifts towards an organism's preferred temperature [91]. This change in distribution has led to impacts on global fisheries, with changes in catch composition from regional landings that are associated with a poleward shift [92]. However, sessile organisms are at greater risk as they cannot migrate unless they rapidly reproduce [93]. Such species are at risk from negative impacts of rising temperatures including increased spread of diseases and being outcompeted by fast-growing, more tolerant algae and thermal stress [94].

[5] Havant Thicket Reservoir application submitted to Havant Borough Council in 2020, consented in 2021 (APP/20/00990).

9.7.85 Atmospheric CO_2 is in an equilibrium with aqueous CO_2. As the amount of atmospheric CO_2 has increased, this has led to a shift in the equilibrium and consequently more CO_2 is absorbed into the ocean. The ocean is a carbon sink, absorbing approximately one-third of the atmospheric CO_2 [95]. Furthermore, this has led to an increase in aqueous CO_2 and has led to more carbonic acid in the oceans [96] lowering the pH of the ocean.

9.7.86 This decrease in pH has resulted in negative impacts on organisms with calcium carbonate ($CaCO_3$) structures, as the bicarbonate (CO_3^{2-}) in the ocean is used to neutralise carbonic acid. This has led to taxa such as mussels and oysters having thinner shells meaning they are less protected from environmental pressures [97]. In addition, ocean acidification impacts the calcium carbonate anatomic structures of calcareous species, such as *Corallina officinalis* (present within the South Wight Maritime SAC), disproportionately more than non-calcareous species, like algae, making the former less competitive [98]. Thus, this reduction in carbonate availability may likely cause impacts at the species level by reducing calcifying species and their habitats, which may cascade through to widespread community change [99].

9.7.87 Climate change has the potential to impact the oxygen levels of the ocean, which can lead to shifts in species. Ocean deoxygenation is occurring at all depths due to lower solubility of oxygen in warmer waters, stronger vertical stratification (steeper temperature gradient) inhibiting diffusion of oxygen from surface to deep ocean and more sluggish deep circulation reducing oxygen supply to deep waters.

9.7.88 Increased nutrient inputs to the ocean through river runoff and atmospheric deposition are promoting algal blooms, increasing oxygen demand, and causing development of hundreds of coastal hypoxic (dead) zones as well as intensification of naturally formed low-oxygen zones [100]. This phenomenon reduces suitable habitats for many bottom-associated marine organisms, squeezes midwater species towards the better oxygenated surface waters and disrupts biogeochemical cycles. Furthermore, studies have indicated that deoxygenation results in diversity in benthic assemblages are decreasing 13-fold; abundance of benthic infauna, 25-fold; and biomass, 10-fold as dissolved oxygen approached levels of 0.05 mg L^{-1} in a seasonally severe coastal low oxygen zone.

9.7.89 Fish schooling behaviour is known to respond to varying oxycline depth and krill swarms may be oxygen-limited [99]. Moreover, coastal hypoxia events lead to shifts in distribution, mobility, predator avoidance and mortality of gilled animals. Severe or prolonged hypoxia can lead to shifts in food web, with potential for impacting foraging success of marine mammals [100].

9.7.90 Fish communities and phytoplankton abundance can be affected by climate change. For example, climate change is projected to increase phenological mismatches between trophic levels because different oceanic factors cause phytoplankton blooms and fish reproduction. For instance, studies show that by the end of the century, increased stratification could cause spring and summer phytoplankton blooms to start 16 days earlier on average at latitudes greater than 40°N. Furthermore, range shifts in fish spawning grounds act to ameliorate the extent of these mismatches across many mid-to-high latitude regions, indicating that fish species whose dispersal capacity is limited may be the most vulnerable to this specific climate change impact [101]. Additionally, phytoplankton species composition and size structure can be affected by climate warming and it favours

species traits best adapted to changing conditions associated with climate change [102].

9.7.91 Increasing global temperatures will stimulate stratification of the water column which, in tropical and mid-latitudes will exacerbate nutrient limitation in surface waters. This in turn will lead to changes in phytoplankton assemblage composition, primary productivity and sensitivity to UVB radiation [103].

9.7.92 Precipitation changes are projected as continuing to increase in the winter but decrease during summer months. Future climate change is expected to bring about a change in the seasonality of extremes, such as increases in hourly precipitation extremes (refer to section 10.7 in ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6)).

9.7.93 Sea levels are predicted to rise due to climate change. From the projection of sea level rise over the temporal scope of the Proposed Development, the rise will continue to increase to 0.58m to 1.04m by the end of 2099 (refer to section 10.7 in ES Chapter 10 Carbon and climate change, Volume I (Document reference 6.1, DCO Volume 6)). In the Solent, sea level change is predicted to rise from 1.2m to 1.6m by 2125. This may lead to a loss of coastal habitats in the area, such as seagrass and saltmarsh [61]. This rise can also lead to an increased risk to marine environments from erosion and the risk of exposing old landfill sites which can leach excess nutrients into the Solent [61].

9.8 Assessment of likely significant effects

9.8.1 This section presents the assessment of likely significant effects on marine biodiversity resulting from the construction, operation, and decommissioning of the Proposed Development. The likely significant effects of the components of the Proposed Development scoped in for this topic are identified and assessed taking into account primary and tertiary mitigation. Depending on which component of the Proposed Development gives rise to the effect, the effect would be on either study area 1 or study area 2. Effects from the WRP site and pipelines on Langstone Harbour and tidal zone of Hermitage Stream would be on study area 1, whilst effects from use of existing Eastney LSO which is limited to the operational phase only would be on study area 2. Following assessment, the need for secondary mitigation is considered in section 9.9 and residual effects are explained in section 9.10.

Construction effects

Pollution events

9.8.2 Pollution events resulting from the construction of the WRP site and its SuDS outfall and the Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site could lead to impacts on marine biodiversity receptors within study area 1. The magnitude of these impacts is assessed below with relevant tertiary mitigation considered.

9.8.3 The use of construction plant and machinery and associated chemicals (e.g. fuel, lubricants, coolants) within the flood zone areas, would pose a risk of pollution spills (both toxic and non-toxic) into the Hermitage Stream, which is hydrologically linked to Langstone Harbour. This could pose a risk to marine biodiversity

receptors; however, any likely spills during normal construction activities would generally be small scale which limits their magnitude of impact. With the natural flow and exchange of waters within Langstone Harbour, the compounds released would dilute whilst they disperse with received concentrations generally showing an exponential decay with distance from the spill location. Compound concentration at the spill location would also be diluted over time from the active dispersion processes, and degradation or settlement depending upon the type of contaminants spilled. These processes would occur even without remedial actions.

9.8.4 Should any non-toxic pollutants (suspended sediments, fresh water, organic matter, etc.) enter the water environment, there may be temporary habitat loss for fish species and depending on its nature it may be an irritant to fish gills which would also cause temporary harm. If toxic pollutants (fuels, lubricants, antifreezes etc) are released then there would be potential harm to marine benthic receptors either directly where concentrations are above effect thresholds, or indirectly where it causes loss of food sources, depending upon the nature of the toxic compounds. Both these pathways also have the potential to indirectly affect bass fisheries, particularly if it alters concentrations of compounds so that it harms egg and fry development. However, the degree of impact is more likely to be greater on smaller organisms in the immediate area of spillage. The contaminants would dilute over time so impacts would be temporary, and if any compounds released could bioaccumulate the total volumes in question are likely to be insignificant compared to existing burdens from more persistent sources.

9.8.5 The use of tertiary mitigation measures set out in the Outline CEMP (Document reference 7.1, DCO Volume 7) would minimise the chance of spills into the marine environment occurring and provide active intervention to remediate any spills in the unlikely event of a direct spill. Examples of these measures include routing all drainage through site drainage systems, provision of interceptor drains for settlement of sediment, storing chemicals in bunded compounds, provision of drip trays, etc., as presented in the Outline CEMP (Document reference 7.1, DCO Volume 7). With the implementation of these measures, the risk of pollution events is considered to be limited. Therefore, the potential impact after mitigation is negligible.

9.8.6 The WRP site works are being undertaken on a historical landfill site, adjacent to the Hermitage Stream which has the potential for leachate and contamination to enter the surface water in Hermitage Stream and Langstone Harbour through pathways identified in ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6). However, appropriate primary and tertiary mitigation measures are in place, and the magnitude of impact is reduced to negligible, as assessed in ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6). Therefore, potential impacts on surface water in Hermitage Stream and Langstone Harbour are considered negligible.

9.8.7 The SuDS outfall at the WRP site would consist of a concrete lined channel running from an attenuation basin to a concrete headwall structure that would discharge into the tidal section of Hermitage Stream (as described in ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6)), therefore the use of construction machinery and associated chemicals (e.g. fuel, lubricants, coolants) for this outfall next to Hermitage Stream may also

pose pollution risk. Potential use of concrete could also lead to pollution in the tidal zone of Hermitage Stream. The final design and construction methodology for the SuDS outfall at the WRP site are currently unknown. Therefore, the assessment of likely significant effects resulting from the construction of the SuDS outfall has been based on the worst case scenario. However, the SuDS outfall will be designed in line with the Design Principles Document (Document reference 5.11, DCO Volume 5). Tertiary mitigation to avoid pollution in the tidal zone is set out in the Outline CEMP (Document reference 7.1, DCO Volume 7) and includes using a temporary cofferdam or sandbags, or other appropriate measure to enclose and create a dry environment for concrete work near water. Therefore, potential impact from the SuDS outfall construction is reduced to negligible.

9.8.8 Construction works for the Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site may also pose pollution risk due to accidental spillage from microtunnelling to be used for trenchless construction. There is a risk of potential blow-out[6] occurring under the Hermitage Stream during the microtunnelling process for constructing the pipelines. This could lead to pollutants, drilling fluids and/or sediments travelling downstream into Langstone Harbour and result in temporary habitat loss in the harbour through water quality degradation and/or smothering. However, tertiary mitigation measures relating to potential pollution from a blow-out event are presented in and secured through the Outline CEMP (Document reference 7.1, DCO Volume 7) which outlines a Drilling Fluid Management Plan (DFMP) to reduce this risk. With implementation of these measures, the risk of pollution event is limited and temporary only.

9.8.9 In summary, tertiary mitigation measures are set out in the Outline CEMP (Document reference 7.1, DCO Volume 7) to manage construction effects of pollution events, to control any incident spills and to remove risk of sediment entrainment into the marine environment under both normal and flood conditions to reduce pollution. With these tertiary mitigation measures, the impact magnitude of pollution events from the WRP site and its SuDS outfall is considered to be negligible.

Designated sites

9.8.10 Internationally designated sites (i.e. SAC, SPA and Ramsar sites) are recognised as being of very high importance, while nationally designated sites (i.e. SSSI) are recognised as being of high importance. Solent Maritime SAC and Chichester and Langstone Harbours Ramsar and SPA are within study area 1 and may be affected due to being within the ZoI of the Proposed Development. With tertiary mitigation in place (referenced in section 9.4 of this chapter and set out in the Outline CEMP (Document reference 7.1, DCO Volume 7)) leading to a negligible impact magnitude, the effect of pollution events on designated sites with the highest level of importance (i.e. very high) is considered to be a minor adverse effect at most, which is not significant.

[6] A blow-out is where the pressure of a tunnel unintentionally causes it to push the soils or sediment towards the river or seabed and may potentially result in waters entering the tunnel causing a possible collapse due to sudden depressurisation.

Marine mammals

9.8.11 Marine mammals are protected under international conventions and recognised as being of very high importance. Within study area 1, harbour seal and grey seal recorded in Langstone Harbour may be affected, while other marine mammals were not observed in the area. With tertiary mitigation in place leading to a negligible impact magnitude, the effect of pollution events on marine mammals with the highest level of importance (i.e. very high) is considered to be minor adverse at most, which is not significant.

Fish

9.8.12 Various fish recorded within study area 1 (see Table 9-16) are recognised as species of principal importance in England and therefore the importance of the receptor is considered high, with the exception of the short-snouted seahorse and European eel, which are protected at an international level and thus considered as being of very high importance. With tertiary mitigation in place, leading to a negligible impact magnitude, the effect of potential pollution events on fish with the highest level of importance (i.e. very high) is considered to be a minor adverse effect at most, which is not significant.

Marine habitats

9.8.13 Marine habitats including intertidal mudflats, coastal saltmarsh and seagrass recorded within study area 1 are recognised as habitats of principal importance in England and thus considered as being of high importance. With tertiary mitigation in place, leading to a negligible impact magnitude of pollution events, the effect of pollution associated with short-term temporary habitat loss on marine habitats with the highest level of importance (i.e. high) is considered to be a minor adverse effect at most, which is not significant.

Benthic marine species

9.8.14 Benthic marine species that could be present within study area 1 include species of principal importance in England, thus they are considered as being of high importance. With tertiary mitigation in place, leading to a negligible impact magnitude, the effect of pollution events on benthic marine species with the highest level of importance (i.e. high) is considered to be a minor adverse effect at most, which is not significant.

Fisheries

9.8.15 Fisheries in Langstone Harbour are limited to recreational sea bass and a small fleet of commercial fishing vessels catching clams, whelks, oysters and finfish from its waters [104]. Langstone Harbour is a designated sea bass nursery area and a WFD designated Shellfish Water with a classified bivalve mollusc harvesting area for the hard-shell clam (*Mercenaria mercenaria*). As such, the receptor vulnerability is considered high. With tertiary mitigation in place, leading to a negligible impact magnitude, the effect of pollution events on fisheries with the highest level of vulnerability (i.e. high) is considered to be a minor adverse at most, which is not significant.

Water Recycling Plant site

Habitat loss from construction of the SuDS outfall

9.8.16 As the construction methodology for the SuDS outfall at the WRP site will be determined post-consent, a worst case has been assumed that direct habitat loss of the existing stream bank at the tidal section of Hermitage Stream would happen during works such as excavation. However, the intertidal walkover survey of the Hermitage Stream section next to the WRP site (as described in paragraph 9.7.40) showed that habitat along the stream bank around the proposed location of SuDS outfall is a revetment (artificial hard structure). This is an artificial marine habitat and not a priority habitat, that will be replaced by the SuDS outfall structure, thus replacing one type of artificial habitat with another. Therefore, direct loss of this artificial habitat is temporary, and the impact magnitude is considered to be negligible.

Designated sites

9.8.17 Internationally designated sites are recognised as being of very high importance. With a negligible impact magnitude of temporary loss of artificial habitat at Hermitage Stream that would not affect any of the designated sites, the effect of habitat loss from construction of the SuDS outfall on designated sites with the highest level of importance (i.e. very high) is considered to be minor adverse at most, and not significant.

Marine mammals

9.8.18 Marine mammals are protected under international conventions and recognised as being of very high importance. Within study area 1, harbour seal and grey seal recorded in Langstone Harbour are not likely to use the artificial habitat affected, while other marine mammals are not observed in the area. With a negligible impact magnitude of temporary loss of artificial habitat at Hermitage Stream that would not affect any of the marine mammals, the effect of habitat loss from construction of the SuDS outfall on marine mammals with the highest level of importance (i.e. very high) is therefore considered to be minor adverse at most, and not significant.

Fish

9.8.19 Various fish species including migratory fish recorded within study area 1 are recognised as being of high to very high importance. However, these fish species are not likely relying on the artificial habitat affected at Hermitage Stream. With a negligible impact magnitude, the effect of habitat loss from construction of the SuDS outfall on fish with the highest level of importance (i.e. very high) is therefore considered to be minor adverse at most, and not significant.

Marine habitats

9.8.20 Habitats identified along the bank of the Hermitage Stream were artificial hard structures with littoral mud and estuary wrack which are common in variable salinity habitats. Some marine habitats recorded within study area 1 are recognised as being of high importance (as mentioned above in paragraph 9.8.13); however, it is very unlikely for temporary loss of artificial habitat at Hermitage Stream to have

any associated impact on these marine habitats of high importance. Therefore, the effect of habitat loss from construction of the SuDS outfall on marine habitats with the highest level of importance (i.e. high) is considered to be minor adverse at most, and not significant.

Benthic marine species

9.8.21 Marine species observed at the intertidal mud on the channelled bank of Hermitage Stream around the assumed location of SuDS outfall were polychaetes that are considered as being of low importance, while those high-important benthic marine species further out in Langstone Harbour within study area 1 are not likely to be affected by the temporary loss of artificial habitat at Hermitage Stream. The impact magnitude is negligible, therefore, the effect of habitat loss from construction of the SuDS outfall on benthic marine species with the highest level of importance (i.e. high) is considered to be minor adverse at most, and not significant.

Fisheries

9.8.22 As Langstone Harbour is a designated European sea bass nursery area, the receptor vulnerability is considered high. However, fisheries species are not likely relying on the artificial habitat affected at Hermitage Stream, so it is very unlikely for temporary loss of artificial habitat to have any associated impact on this fisheries receptor of high vulnerability. Therefore, impact magnitude is negligible, and subsequently the effect of habitat loss from construction of the SuDS outfall on fisheries with the highest level of vulnerability (i.e. high) is assessed as minor adverse at most, and not significant.

Introduction of INNS from construction of the SuDS outfall

9.8.23 It is currently planned for the SuDS outfall to be constructed at the tidal section of Hermitage Stream, and so, there is a pathway during construction for INNS to potentially enter intertidal water, therefore potential effects of introduction of INNS are assessed.

9.8.24 Tertiary mitigation measures on avoiding introduction of INNS during construction are set out in the Outline CEMP (Document reference 7.1, DCO Volume 7) and the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7). With the implementation of tertiary mitigation, the risk of introduction of INNS from construction is reduced to unlikely, therefore, the impact magnitude of introduction of INNS from construction of the SuDS outfall is considered to be negligible.

Designated sites

9.8.25 Internationally designated sites are recognised as being of very high importance. With tertiary mitigation in place, the impact magnitude is negligible, therefore, the effect of introduction of INNS from construction of the SuDS outfall on designated sites with the highest level of importance (i.e. very high), is considered to be minor adverse at most, and not significant.

Marine mammals

9.8.26 Marine mammals are protected under international conventions and recognised as being of very high importance. With tertiary mitigation in place leading to a negligible impact magnitude, the effect of introduction of INNS from construction of the SuDS outfall on marine mammals with the highest level of importance (i.e. very high) is considered to be minor adverse at most, and not significant.

Fish

9.8.27 Various fish species including migratory fish recorded within study area 1 are recognised as being of high to very high importance (as discussed in paragraph 9.8.12). With tertiary mitigation in place the impact magnitude is negligible, therefore, the effect of introduction of INNS from construction of the SuDS outfall on fish with the highest level of importance (i.e. very high) is considered to be minor adverse at most, and not significant.

Marine habitats

9.8.28 The habitats identified along the bank of the Hermitage Stream were artificial hard structures with littoral mud and estuary wrack which are common in variable salinity habitats. Some marine habitats recorded within study area 1 are recognised as being of high importance (as mentioned above in paragraph 9.8.13). With tertiary mitigation in place leading to a negligible impact magnitude, the effect of introduction of INNS from construction of the SuDS outfall on marine habitats with the highest level of importance (i.e. high) is considered to be minor adverse at most, and not significant.

Benthic marine species

9.8.29 Benthic species that could be present within study area 1 include species of principal importance in England, thus they are considered as being of high importance. With tertiary mitigation in place the impact magnitude is negligible, therefore, the effect of introduction of INNS from construction of the SuDS outfall on benthic marine species with the highest level of importance (i.e. high) is considered to be a minor adverse effect at most, which is not significant.

Fisheries

9.8.30 As Langstone Harbour is a designated European sea bass nursery area of national importance, the vulnerability of receptor is considered as high. With tertiary mitigation in place, the impact magnitude is negligible, therefore, the effect of introduction of INNS from construction of the SuDS outfall on fisheries with the highest level of vulnerability (i.e. high) is assessed as minor adverse at most, and not significant.

Light disturbance

9.8.31 There will be task lighting during construction, and lighting will also be used on site for working after dark. However, good construction practices in controlling the amount of light generated on site and task lighting are secured through the Outline CEMP (Document reference 7.1, DCO Volume 7) which would reduce potential

light disturbance. With the implementation of tertiary mitigation measures to avoid light pollution during construction, it is considered that the impact magnitude of light disturbance is negligible.

9.8.32 It should be noted that light disturbance effects on marine mammals and fish during construction was scoped out (refer to EIA Scoping Opinion ID 3.4.4 presented in Table 9-5). The artificial light baseline is also generally high in the region[7].

Designated sites

9.8.33 Internationally designated sites are recognised as being of very high importance. Internationally designated sites that are relatively vulnerable to light disturbance include the Chichester and Langstone Harbours SPA/Ramsar site, and the Solent and Dorset Coast SPA where these are in close proximity to the task lighting or the WRP site and their qualifying features (bird species) are relatively sensitive to artificial light. With tertiary mitigation in place leading to a negligible impact magnitude, the effect of light disturbance on designated sites marine features with very high level of importance is considered to be minor adverse at most, and not significant. ES Chapter 8 Terrestrial and freshwater biodiversity in Volume I of the ES states that effects to designated bird species is considered to be minor adverse and not significant.

Marine habitats

9.8.34 Some marine habitats recorded within study area 1 are recognised as being of high importance (as discussed in paragraph 9.8.13). With tertiary mitigation in place leading to a negligible impact magnitude, the effect of light disturbance on marine habitats with the highest level of importance (i.e., high) is considered to be minor adverse at most, and not significant.

Benthic marine species

9.8.35 Benthic marine species that could be present within study area 1 include species of principal importance in England, which are considered as being of high importance. With tertiary mitigation measures in place leading to a negligible impact magnitude, the effect of light disturbance on benthic marine species with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, which is not significant.

Fisheries

9.8.36 As Langstone Harbour is a designated European sea bass nursery area, the receptor vulnerability is considered high. With tertiary mitigation in place, the impact magnitude is negligible, therefore, the effect of light disturbance on fisheries with the highest level of vulnerability (i.e., high) is assessed as minor adverse at most, and not significant.

[7] The Countryside Charity, 2016. England's Light Pollution and Dark Skies. Available from England's Light Pollution and Dark Skies

Increased sedimentation from construction of the SuDS outfall

9.8.37 Construction of the SuDS outfall at the WRP site may include excavation and backfilling works on the bank of Hermitage Stream. These works, if uncontrolled, could lead to increased sedimentation in Hermitage Stream and potential sediment dispersion towards Langstone Harbour.

9.8.38 Tertiary mitigation measures including good construction practices for controlling surface sediment runoff and enclosing a dry environment for work near water, such as sediment traps, pumping out standing water via settling tank, and use of sandbags or sheet piling, are set out in the Outline CEMP (Document reference 7.1, DCO Volume 7) for reducing the risk of sedimentation. With the implementation of these tertiary measures, the potential for and magnitude of increased sedimentation impact on Hermitage Stream and Langstone Harbour is negligible.

Designated sites

9.8.39 Internationally designated sites are recognised as being of very high importance. With tertiary mitigation a negligible impact magnitude of increased sedimentation in Hermitage Stream and Langstone Harbour would not affect any of the designated sites, therefore the effect of increased sedimentation from construction of the SuDS outfall of designated sites with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Marine mammals

9.8.40 Marine mammals are protected under international conventions and recognised as being of very high importance. Within study area 1, harbour seal and grey seal are recorded in Langstone Harbour only and they are not likely to use the Hermitage Stream, while other marine mammals are not observed in the area. With tertiary mitigation the magnitude of increased sedimentation in Hermitage Stream and Langstone Harbour would be negligible, and the effect of increased sedimentation from construction of the SuDS outfall on marine mammals with the highest level of importance (i.e., very high) is therefore considered to be a minor adverse effect at most, and not significant.

Fish

9.8.41 Various fish species including migratory fish recorded within study area 1 are recognised as being of high to very high importance. With a negligible impact magnitude, the effect of increased sedimentation in Hermitage Stream from construction of the SuDS outfall on fish with the highest level of importance (i.e., very high) is therefore considered to be a minor adverse effect at most, and not significant.

Marine habitats

9.8.42 Habitats identified along the bank of the Hermitage Stream were artificial hard structures with littoral mud and estuary wrack which are common in variable salinity habitats. Some marine habitats recorded within study area 1 are recognised as being of high importance (as mentioned above in paragraph 9.8.13); however, with

the implementation of tertiary mitigation the potential for and magnitude of increased sedimentation impact is considered to be negligible. Therefore, the effect of increased sedimentation from construction of the SuDS outfall on marine habitats with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Benthic marine species

9.8.43 Marine species observed at the intertidal mud on the channelled bank of Hermitage Stream around the assumed location of SuDS outfall were polychaetes that are considered as being of low importance, while those high-important benthic marine species further out in Langstone Harbour, within study area 1 are not likely to be affected by negligible increased sedimentation in Hermitage Stream. The impact magnitude is negligible, therefore, the effect of increased sedimentation from construction of the SuDS outfall on benthic marine species with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Fisheries

9.8.44 As Langstone Harbour is a designated European sea bass nursery area, the receptor vulnerability is considered high. However, impact magnitude of increased sedimentation is negligible with tertiary measures, so it is very unlikely for increased sedimentation to have any associated impact on this fisheries receptor of high vulnerability. Therefore, the effect of increased sedimentation from construction of the SuDS outfall on fisheries with the highest level of vulnerability (i.e., high) is assessed as a minor adverse effect at most, and not significant.

Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site

Underwater noise and vibration

9.8.45 Construction of the pipelines may have an impact on the marine environment in study area 1 as a result of underwater noise and vibration during the construction phase.

9.8.46 The pipelines would be constructed under the Hermitage Stream using a microtunnel boring machine (MTBM) for trenchless construction, as outlined in Table 3-2 of ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6).

9.8.47 The launch shaft for trenchless construction would be located at the WRP site, with the reception shaft located at Budds Farm WTW (refer to section 3.5 in ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6)). Microtunnelling would be carried out from the launch shaft with a jacking frame to allow insertion of the pipes. Geology encountered during specific ground investigation for the pipelines are provided in Table 11-23 of ES Chapter 11 Land quality and ground conditions, Volume I (Document reference 6.1, DCO Volume 6).

9.8.48 Few studies of noise and vibration from drilling under watercourses exist and those that do are referring to a tunnel boring machine (TBM) or horizontal directional

drilling (HDD). For TBM, the Lower Thames Crossing project has modelled and predicted underwater noise at the worst case location above the TBM with a peak of 130 decibels (dB) re 1µPa[8] at 100 hertz (Hz) one third octave band, which would diminish with increasing distance, and the likely worst case vibration (in terms of particle velocity) at 0.01mm/s, both are found to be below thresholds likely to cause harm to aquatic species [105]. For HDD, existing studies of drilling for cable ducts with a maximum of 280mm at 5.1m below river bed[9] have recorded an underwater sound peak of 100dB re 1µPa at 600Hz one third octave band, and vibration at river bank being 1.4mm/s [106], which are both lower than the thresholds for harm in published guidance (reference is discussed against marine biodiversity receptor below in paragraphs 9.8.54 and 9.8.55). The MTBM used for the pipelines emits lower levels of noise and vibration compared to TBM especially when using remote controlled equipment from the surface, and similarly to HDD that the noise and vibration from MTBM is also considered lower than the thresholds for harm.

9.8.49 Given the information on underwater noise and vibration above, levels of vibration and underwater noise are predicted to be extremely low. Responses of each of the marine biodiversity receptors to underwater noise and vibration are discussed below, with information on thresholds for harm in published guidance referenced, where available.

9.8.50 It should be noted that underwater noise and vibration effects on marine habitats during construction was scoped out of this assessment (refer to EIA Scoping Opinion ID 3.4.7 presented in Table 9-5).

Designated sites

9.8.51 The most sensitive designated sites are the internationally designated sites that are recognised as being of very high importance. The impact magnitude is negligible, as discussed above, therefore, the effect of underwater noise and vibration from the pipelines construction on designated sites with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Marine mammals

9.8.52 Marine mammals recorded within Langstone Harbour (study area 1) are Harbour seals and grey seals which haul-out on intertidal mudflats in Langstone Harbour during low tide. They are protected under international conventions and recognised as being of very high importance. The noise and vibration from the construction of the underground pipelines is extremely low, as discussed above, and not considered to reach Langstone Harbour, and thus impact magnitude on seals is negligible. Therefore, it is considered as a minor adverse effect at most, which is not significant.

[8] 're 1 µPa' indicates the reference pressure of one microPascal

[9] Data has been informed by a confidential report prepared by Mott MacDonald for National Grid who gave permission for it to be used in this chapter and includes proprietary survey results not available in the public domain [106]. Geology of the site was sand, silt and gravel. The hydrophone was suspended approximately 1m above the river bed, whilst the vibration monitor on the river bank was about 7.9m from the HDD source.

Fish

9.8.53 Noise and vibration from tunnelling propagating into the water column and potentially causing a barrier to migration, disturbing spawning or damaging fish eggs was raised as a concern during Summer 2024 Consultation (summarised within the Consultation Report (Document reference 5.1, DCO Volume 5)). Underwater noise from the microtunnelling would be continuous rather than impulsive and thresholds for effects on fish and fish eggs are not well defined. However, the industry standard guidance developed by Popper *et al.* (2014) [107] suggests that potential effects of continuous underwater noise on fish are defined in terms of near, far, and intermediate distance from the sound rather than providing a definitive threshold value; the only exception to this are fish with a swim bladder involved in hearing, such as salmon[10] [107]. It should be noted that no thresholds exist for potential effects of continuous underwater noise on fish eggs and larvae.

9.8.54 Thresholds for potential mortality or mortal injury from impulsive vibration on fish eggs and larvae has been stated as 1.3cm/s from Canadian standards [107, 108], or two inches/s (5.08cm/s) from Alaskan standards [109]. Continuous vibration thresholds have not been determined to date. The vibration from construction of the pipelines using microtunnelling under Hermitage Stream would be continuous rather than impulsive.

9.8.55 Fish species that have been identified as potentially at risk are migratory salmonids, lamprey species, and European eel. The hearing threshold for Atlantic salmon, as a proxy for all salmonids, is approximately 105dB re 1µPa at the most sensitive frequency band of 100Hz to 200Hz. As the frequency increases so does the hearing threshold and the sound needs to be louder to be detected. For lamprey, hearing seems to be limited to frequencies below 300Hz and between 144 and 155dB re 1µPa [110] and European eel hearing appears most sensitive at approximately 80Hz frequency and 95dB re 1µPa. As the frequency increases, the threshold for detection also increases, such that at approximately 300Hz the threshold of detection is over 140dB re 1µPa [111].

9.8.56 Considering fish species in Langstone Harbour (study area 1), the only migratory fish species identified during surveys were European eel and European smelt. European eel is listed as internationally protected under the CITES, CMS and OSPAR Convention and considered as being of very high importance, whilst European smelt is listed as UK Priority Species and considered as being of high importance. However, during surveys the condition of Hermitage Stream was found to be heavily modified with structures present that obstruct migration of these fish species, particularly the smelt. These structures include the main lock/weir which prevents access to the stream and will not be removed during the construction works so there is not anticipated to be an improvement to the marine environment. As such, it is considered unlikely that smelt are migrating up Hermitage Stream, although eel may migrate as they are able to traverse land, if necessary.

9.8.57 Given the information above, it is not considered that there would be a barrier to migration caused by underwater noise or vibration from the construction of the

[10] Threshold of potential harm causing a recoverable injury is set at 170dB rms for 48h, and for temporary threshold shift (TTS) i.e. temporary hearing loss/reduction, the threshold is 158 dB rms for 12h.

pipelines beneath Hermitage Stream, and any detrimental effects of vibration from the construction on fish, fish eggs, or larvae are not considered likely, as the levels of underwater noise and vibration are predicted to be extremely low and/or the species of concern are unlikely to be migrating or spawning within the Hermitage Stream. Although fish are considered to be a receptor of high to very high importance, the magnitude of impact is negligible and therefore the effect is considered to be minor adverse at most, which is not significant.

Benthic marine species

9.8.58 Benthic marine species that could be present within study area 1 include species of principal importance in England, thus the receptor is considered to be of high importance. The impact magnitude is negligible, as discussed above, therefore, the effect of underwater noise and vibration from the pipelines construction on benthic marine species with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Fisheries

9.8.59 Underwater noise and vibration may also impact commercially targeted fish and shellfish species and, as identified in paragraph 9.8.15, the European sea bass nursery area is of high vulnerability. If juvenile fish, larvae, or eggs are present, they may be more vulnerable to changes in the baseline condition, such as underwater noise and vibration generated by microtunnelling that would be used for trenchless construction of the underground pipelines. However, the impact magnitude is negligible, as discussed above, therefore, the effect of underwater noise and vibration from the pipelines construction on fisheries with the highest level of vulnerability (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Operational effects

Water Recycling Plant site

Light disturbance

9.8.60 General lighting design principles of external lighting would be implemented to limit obtrusive light at the WRP site. Information about lighting design principles avoiding light impact during operation is included in the Design Principles Document (Document reference 5.11, DCO Volume 5). With primary and tertiary mitigation (as discussed in section 9.4) in place, the impact magnitude of light disturbance is considered to be negligible.

9.8.61 It should be noted that light disturbance effects on marine mammals and fish during operation was scoped out (refer to EIA Scoping Opinion ID 3.4.4 presented in Table 9-5), as the artificial light baseline is generally high in the region.

Designated sites

9.8.62 Internationally designated sites are recognised as being of very high importance. With primary and tertiary mitigation in place leading to a negligible impact magnitude, the effect of light disturbance on designated sites with the highest level

of importance (i.e., very high) is considered to be minor adverse at most, which is not significant.

Marine habitats

9.8.63 Some marine habitats recorded within study area 1 are recognised as being of high importance (as discussed in paragraph 9.8.13). With primary and tertiary mitigation in place (as discussed in section 9.4) leading to a negligible impact magnitude, the effect of light disturbance on marine habitats with the highest level of importance (i.e., high) is considered to be minor adverse at most, and not significant.

Benthic marine species

9.8.64 Benthic marine species that could be present within study area 1 include species of principal importance in England, thus considered as being of high importance. With primary and tertiary mitigation measures in place leading to a negligible impact magnitude, the effect of light disturbance on benthic marine species with the highest level of importance (i.e., high) is considered to be minor adverse at most, which is not significant.

Fisheries

9.8.65 As Langstone Harbour is a designated European sea bass nursery area, the receptor vulnerability is considered high. With primary and tertiary mitigation in place (as discussed in section 9.4), the impact magnitude is negligible, therefore, the effect of light disturbance on fisheries with the highest level of vulnerability (i.e., high) is assessed as minor adverse at most, and not significant.

Operational effect of freshwater influence from SuDS outfall into the Hermitage Stream

9.8.66 Water flow from the SuDS outfall is anticipated to have an increased freshwater influence on the salinity in the tidal reach of the Hermitage Stream and potentially Langstone Harbour (study area 1). As mentioned in section 19.8 of the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6), water from the SuDS outfall would be of a lower salinity than that within the receiving brackish water in the tidal Hermitage Stream.

9.8.67 To assess the salinity change, dispersion modelling has been undertaken as detailed ES Appendix 19.12 Water Recycling Plant site Sustainable Drainage System dispersion modelling, Volume II (Document reference 6.2, DCO Volume 6). It is summarised in section 19.8 of the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6) that the change in salinity associated with the intermittent water from the SuDS outfall, compared with the natural fluctuations in ambient salinity levels throughout the tidal cycle, is insignificant (<0.1 Practical Salinity Unit (PSU)), with greater differences confined to small areas of the tidal Hermitage Stream close to the outfall and would not extend further into Langstone Harbour. The impact magnitude of freshwater influence from the SuDS outfall on the salinity change in the tidal reach of the Hermitage Stream and Langstone Harbour is therefore considered to be negligible.

Designated sites

9.8.68 Internationally designated sites are recognised as being a receptor of very high importance. As discussed in paragraph 9.8.67, the impact magnitude of salinity change is negligible, therefore, the effect of freshwater influence from the SuDS outfall on designated sites with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Marine mammals

9.8.69 Marine mammals are protected under international conventions and recognised as being a receptor of very high importance. As discussed in paragraph 9.8.67, the impact magnitude of salinity change is negligible, therefore the effect of freshwater influence from the SuDS outfall on marine mammals with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Fish

9.8.70 Various fish species including migratory fish recorded within study area 1 are recognised as being of high to very high importance (as discussed in paragraph 9.8.12). European eel recorded in the tidal reaches of the Hermitage Stream is a euryhaline species, adapted to a wide range of salinity. As discussed in paragraph 9.8.67, the impact magnitude of salinity change is negligible, therefore, the effect of freshwater influence from the SuDS outfall on fish with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

9.8.71 Apart from the freshwater influence on salinity, as part of stakeholder engagement (see paragraph 9.3.10), a query was raised regarding European eel which may have a potential to enter through the SuDS outfall into the SuDS outfall pipe that has water outflow from the SuDS basin, leading to a potential risk to eels posed by the SuDS pipe. However, it was agreed in the stakeholder engagement meeting that a vertical step with an overhang/lip would be placed within the SuDS outfall pipe that would make it very difficult for eel to pass and traverse the pipe. This is included in the Design Principles Document (Document reference 5.11, DCO Volume 5). By implementing this primary mitigation, the passage of eels is deterred, and the risk to European eel due to the SuDS outfall pipe or its freshwater outflow is considered negligible. Therefore, no significant effect on European eel is anticipated.

Marine habitats

9.8.72 The habitats identified along the bank of the Hermitage Stream were artificial hard structures with littoral mud and estuary wrack which are common in variable salinity habitats. Some marine habitats recorded within study area 1 are recognised as being of high importance (as discussed in paragraph 9.8.13). As discussed in paragraph 9.8.67, the impact magnitude of salinity change is negligible, therefore, the effect of freshwater influence from the SuDS outfall on marine habitats with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, which is not significant.

Benthic marine species

9.8.73 Benthic marine species that could be present within study area 1 include species of principal importance in England, thus they are considered as being of high importance. As discussed in paragraph 9.8.67 the impact magnitude of salinity change is negligible, therefore, the effect of freshwater influence from the SuDS outfall on benthic marine species with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Fisheries

9.8.74 As Langstone Harbour is a designated European sea bass nursery area, receptor vulnerability is considered to be high. As discussed in paragraph 9.8.67, the impact magnitude is negligible, therefore, the effect of freshwater influence from the SuDS outfall on fisheries with the highest level of vulnerability (i.e., high) is considered to be a minor adverse effect at most, which is not significant.

Introduction of INNS from the operation of the SuDS outfall

9.8.75 In view of the proposed SuDS outfall releasing surface water of the WRP site into the tidal section of Hermitage Stream, there is a pathway for INNS from WRP operation to potentially enter intertidal water, therefore potential effects of introduction of INNS are assessed.

9.8.76 Tertiary mitigation measures on avoiding introduction of INNS from operation are set out in the INNS Biosecurity Plan (Document reference 7.10, DCO Volume 7). With the implementation of tertiary mitigation, the risk of introduction of INNS from the WRP operation is reduced to be unlikely, therefore, the impact magnitude of introduction of INNS from operation of the SuDS outfall is considered to be negligible.

Designated sites

9.8.77 Internationally designated sites are recognised as being of very high importance. With tertiary mitigation in place the impact magnitude is negligible, therefore, the effect of introduction of INNS from operation of the SuDS outfall on designated sites with the highest level of importance (i.e., very high) is considered to be minor adverse at most, and not significant.

Marine mammals

9.8.78 Marine mammals are protected under international conventions and recognised as being of very high importance. With tertiary mitigation in place the risk of INNS introduction is unlikely, leading to a negligible impact magnitude. Therefore, the effect of introduction of INNS from operation of the SuDS outfall on marine mammals with the highest level of importance (i.e., very high) is considered to be minor adverse at most, and not significant.

Fish

9.8.79 Various fish species including migratory fish recorded within study area 1 are recognised as being of high to very high importance (as discussed in paragraph

9.8.12). With tertiary mitigation in place the impact magnitude is negligible, therefore, the effect of introduction of INNS from operation of the SuDS outfall on fish with the highest level of importance (i.e., very high) is considered to be minor adverse at most, and not significant.

Marine habitats

9.8.80 The habitats identified along the bank of the Hermitage Stream were artificial hard structures with littoral mud and estuary wrack which are common in variable salinity habitats. Some marine habitats recorded within study area 1 are recognised as being of high importance (as mentioned above in paragraph 9.8.13). With tertiary mitigation in place (refer to section 9.4) leading to a negligible impact magnitude, the effect of introduction of INNS from operation of the SuDS outfall on marine habitats with the highest level of importance (i.e., high) is considered to be minor adverse at most, and not significant.

Benthic marine species

9.8.81 Benthic marine species that could be present within study area 1 include species of principal importance in England, thus they are considered as being of high importance. With tertiary mitigation in place the impact magnitude is negligible, therefore, the effect of introduction of INNS from operation of the SuDS outfall on benthic marine species with the highest level of importance (i.e., high) is considered to be minor adverse at most, and not significant.

Fisheries

9.8.82 As Langstone Harbour is a designated European sea bass nursery area, the vulnerability of receptor is considered as high. With tertiary mitigation in place, the impact magnitude is negligible, therefore, the effect of introduction of INNS from operation of the SuDS outfall on fisheries with the highest level of vulnerability (i.e., high) is assessed as minor adverse at most, which is not significant.

Pipelines between Budds Farm Wastewater Treatment Works and the Water Recycling Plant site

9.8.83 For the two pipelines below ground level with one to transfer treated wastewater from Budds Farm WTW to the WRP site and the other to transfer reject water from the WRP site to Budds Farm WTW, no impact pathways on marine ecology and fisheries are identified during the operation of the pipelines themselves, therefore, no effects on marine biodiversity receptors are anticipated.

Operational effect of changes in water quality from releases of compensatory flows from Havant Thicket Reservoir

9.8.84 A water quality modelling study has been conducted investigating the mixing and dispersion of water released from HTR through compensatory flows into downstream water bodies that may affect the water quality of Hermitage Stream and Langstone Harbour during WRP operation (refer to ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6), and ES Appendix 19.6 Havant Thicket Reservoir Compensatory Flows water quality modelling, Volume II (Document reference 6.2, DCO Volume 6)).

9.8.85 ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6) discusses the outcome of this modelling which demonstrates that concentrations of the water quality parameters in Hermitage Stream are predicted to be subject to smaller changes over the current baseline compared to those in Riders Lane Stream. Once the HTR is operational with water from spring and surface sources prior to introduction of recycled water from the WRP (which is referred to as the 'classic' operation scenario), the compensatory flows are predicted to result in an increase in median ammonia, dissolved organic carbon (DOC) and dissolved inorganic carbon (DIC) in Hermitage Stream, but a decrease in pH, Biological Oxygen Demand (BOD) and orthophosphate, whilst dissolved oxygen (DO), nitrate and alkalinity would remain unchanged. The introduction of recycled water from the WRP into the HTR, i.e. during the 'post-WRP' operation scenario of compensatory flows, is predicted to result in a decrease in median orthophosphate and DOC in Hermitage Stream, and all other parameters would remain at very similar concentrations to those predicted in the 'classic' operation scenario (see section 19.8 of the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6)). This means that the introduction of recycled water from the WRP into the compensatory flows is not predicted to result in any significant changes in water quality in Hermitage Stream.

9.8.86 With reference to section 19.8 of the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6), the compensatory flows modelling also predicts that there would be very little change in Langstone Harbour between the 'classic' and 'post-WRP' operation scenarios, with the majority of modelled parameters remaining unchanged between the two scenarios. A very small decrease in nitrate (from 2.27mg/l under the 'classic' operation scenario to 2.23mg/l under the 'post-WRP' operation scenario) was predicted in the northern end of the harbour, close to the outlet from Hermitage Stream. This represents a small and spatially-constrained improvement in water quality under the 'post-WRP' operation scenario. No changes to water quality were predicted in the lower harbour or in the connecting water body, the Solent.

9.8.87 An additional scenario, referred to as the 'alternative reservoir fill' scenario where the initial 'classic' operation scenario does not occur (for example, in the event of an extended construction period for Havant Thicket Reservoir) and the filling of HTR is undertaken using both spring water and WRP recycled water, has also been analysed in section 19.8 of the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6) to assess any likely change to predicted water quality in compensatory flows from HTR. The results of statistical comparison of compensatory flow water quality for the 'alternative reservoir fill' scenario and the 'post-WRP' scenario demonstrate slightly higher nitrate, total nitrogen, total phosphorus and orthophosphate but slightly lower ammonia, DIC, BOD and DO in the 'alternative reservoir fill' scenario. However, these differences are very minor that are not considered to be sufficient to alter the findings of the assessments for releases of compensatory flows from HTR to downstream water bodies presented in paragraphs 9.8.85 to 9.8.86. Therefore, the 'alternative reservoir fill' scenarios are not considered likely to result in any different effects than the 'post-WRP' operation scenario that predicted no changes to water quality of downstream water bodies including Hermitage Stream and Langstone Harbour.

9.8.88 It is possible that other alternative reservoir fill scenarios could arise from programme changes; for example, recycled water could be introduced to the

reservoir before the post-fill stabilisation[11] described in ES Appendix 19.11 Havant Thicket Reservoir water quality modelling, Volume II (Document Reference 6.2, Volume 6). While the timing of the source water inputs might change, the quality of the recycled water, spring water and hydrological catchment inputs would remain constant. Consequently, reservoir water quality would align with the 'post-WRP' phase of the original operational scenario once the reservoir has stabilised. The analysis presented above for the alternative reservoir fill scenario supports this by demonstrating that any changes in 'post-stabilisation' water quality are relatively small and are not expected to result in significant effects.

9.8.89 Therefore, taking into consideration the results presented in the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6), the impact magnitude of the change in water quality of Hermitage Stream and Langstone Harbour resulting from operation of the Proposed Development is considered to be negligible.

Designated sites

9.8.90 Internationally designated sites are recognised as being a receptor of very high importance. As discussed in paragraph 9.8.89, the impact magnitude is negligible, therefore, the effect of compensatory flow water quality changes on designated sites with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Marine mammals

9.8.91 Marine mammals are protected under international convention and recognised as being a receptor of very high importance. As discussed in paragraph 9.8.89, the impact magnitude is negligible, therefore, the effect of compensatory flow water quality changes on marine mammals with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Fish

9.8.92 Various fish species including migratory fish recorded within study area 1 are recognised as being a receptor of high to very high importance. As discussed in paragraph 9.8.89, the impact magnitude is negligible, therefore, the effect of compensatory flow water quality changes on fish with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Marine habitats

9.8.93 Marine habitats recorded within study area 1 are recognised as being a receptor of high importance. As discussed in paragraph 9.8.89 the impact magnitude is negligible, therefore, the effect of compensatory flow water quality changes on marine habitats with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, and not significant.

[11] Stabilisation: the first few years after initial inundation of the reservoir basin when terrestrial biomass is decomposed or mineralised, resulting in higher fluxes of organic and inorganic matter than is observed once the reservoir has stabilised.

Benthic marine species

9.8.94 Benthic marine species that could be present within study area 1 include species of principal importance in England, thus they are considered as being a receptor of high importance. As discussed in paragraph 9.8.89, the impact magnitude is negligible, therefore, the effect of compensatory flow water quality changes on benthic marine species with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Fisheries

9.8.95 As Langstone Harbour is a designated European sea bass nursery area, receptor vulnerability is considered to be high. As discussed in paragraph 9.8.89, the impact magnitude is negligible, therefore, the effect of compensatory flow water quality changes on fisheries with the highest level of vulnerability (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Release from the Eastney Long Sea Outfall

Changes in water release from Eastney Long Sea Outfall during operation

9.8.96 Potential effects on marine ecology due to changes in the release of treated wastewater from the Eastney LSO (study area 2) are anticipated for the operational phase. During operation, the WRP would receive treated wastewater from Budds Farm WTW. Within the WRP site, the treated wastewater would be pumped through two filtering processes, firstly micro-filtration to remove remaining impurities that could block the membranes during reverse osmosis, and then reverse osmosis to remove dissolved salts, impurities, bacteria and pharmaceuticals. The next stage of water recycling process would then be advanced oxidation process involving the use of ultraviolet light and hydrogen peroxide to break down any remaining impurities. The existing impurities (in the treated wastewater) removed through the water recycling process produces wastewater known as 'reject water'. This reject water would be returned to Budds Farm WTW by gravity using the Pipelines between the WRP site and Budds Farm WTW. The reject water would then be transferred via a new connection to the existing Eastney Transfer Tunnel (TT) and Eastney Pumping Station (PS) to the existing Eastney LSO.

9.8.97 Currently, the Eastney LSO releases treated wastewater from Budds Farm WTW. The Proposed Development would utilise the Eastney LSO for the release of reject water produced by the WRP. This reject water from the water recycling process is a lower volume than the original volume taken for treatment. Consequently, some of the impurities are slightly more concentrated than before treatment which slightly increases the salinity of the reject water. These are then released alongside the existing treated wastewater not sent for additional processing at the WRP via the LSO. Therefore, compared to the existing baseline, the volume discharged from the LSO when the WRP is in operation is slightly reduced (refer to section 3.6 in ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6)), salinity is slightly increased (though still well below full marine salinity) and compound concentrations are changed.

9.8.98 As a result, the operational release of reject water from the Eastney LSO would have a decreased volume depending on the output of the WRP, as treated wastewater would have been diverted from the Budds Farm WTW to the WRP for additional treatment into recycled water and supply. The reject water would likely be slightly more saline than the existing WTW treated wastewater (although still below full marine salinity). Therefore, operation of the WRP site using the Eastney LSO to release reject water would cause changes to the existing release of treated wastewater from the Eastney LSO with potential implications for water quality parameters in the surrounding marine environment.

9.8.99 The magnitude of this change in water release has been informed by the assessment undertaken in section 19.8 of the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6. Budds Far WTW currently has a final effluent permit which contains specific limits on BOD, COD, suspended solids, total nitrogen and total iron in the treated wastewater. Mass balance calculations were undertaken and the output modelled to determine the potential effect on the existing release associated with removal of wastewater for recycling and addition of the reject stream from the WRP (refer to ES Appendix 19.5 Eastney Long Sea Outfall Solent dispersion modelling, Volume II (Document reference 6.2, DCO Volume 6). Model outputs show that the predicted differences in the currently consented water quality parameters (and salinity) are insignificant when the existing Budds Farm WTW discharge and the future discharge from Budds Farm (once the WRP is in place and reject water is combined) are compared. Details are provided in ES Appendix 19.5 Eastney Long Sea Outfall Solent dispersion modelling, Volume II (Document reference 6.2, DCO Volume 6).

9.8.100 The above mentioned dispersion modelling studies (refer to ES Appendix 19.5 Eastney Long Sea Outfall Solent dispersion modelling, Volume II (Document reference 6.2, DCO Volume 6) also indicated that predicted parameter changes are within baseline variations experienced within the receiving water and likely to be localised around the Eastney LSO where the released water dilutes as the marine environment is well mixed. The modelled output showed that of the ten vertical layers only marginally larger differences were noted at the sea surface. The addition of the reject water to the existing Eastney LSO release would not result in any changes to water quality and changes would not extend into connected water bodies such as the entrances of Portsmouth Harbour, Langstone Harbour or the tidally influenced Hermitage Stream, or Chichester Harbour.

9.8.101 The potential for chemical parameters to be within the combined discharge (i.e., WRP reject water release and the Budds Farm WTW discharge) was also assessed in section 19.8 of the ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6) following EA's guidance for surface water pollution risk assessment. Three chemical parameters including copper, triphenyltin and diflubenzuron were screened in for modelling using the Cornell Mixing Zone Expert System (CORMIX). The outcome is presented in ES Appendix 19.8 Hampshire Water Transfer and Water Recycling Project Eastney Long Sea Outfall – CORMIX Modelling for Chemicals Screened in via the Surface Water Risk Assessment Process, Volume II (Document reference 6.2, DCO Volume 6)) and summarised in ES Chapter 19 Water environment, Volume I (Document reference 6.1, DCO Volume 6).

9.8.102 The modelling results indicate that the distance to required dilution factors (RDF) for these chemical parameters range from 0.17m to 1.03m, meaning that the mixing zone for chemical parameters is spatially limited to the immediate area of the outfall, showing dilution of the chemicals to Environmental Quality Standard (EQS) in the immediate vicinity of the Eastney LSO, and therefore, wide scale impacts on water quality are not predicted.

9.8.103 Furthermore, although these compounds being screened in for potential risk (e.g. triphenyltin and diflubenzuron) are persistent in marine sediments and may have the potential to bioaccumulate in higher trophic levels (e.g. fish and marine mammals), bioaccumulation is unlikely to be significant at EQS levels, and this does not alter the total annual output. Consequently, the scale of change in bioaccumulation is likely to be negligible, subject to the specific bioaccumulation rates of individual compounds.

9.8.104 Potential changes in water quality of the water release from Eastney Long Sea Outfall through the run to waste scenarios have also been considered. In an operational run to waste scenario, the run to waste would be used to release water that does not meet the water quality requirements at the WRP. In an emergency run to waste scenario, water within the WRP would be returned to Budds Farm WTW site by opening the run to waste valve in the event of an emergency shut down of the WRP site (refer to section 3.3 in ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6)). This run to waste discharge would be subject to good practice measures as set out in the OEMP (Document reference 7.7, DCO Volume 7) that requires the Contractor to develop an Emergency Response Plan which will include a suite of Incident Management procedures. These will set out procedures to manage water quality, in alignment with standard industry practices and Southern Water's established procedures, secured in the OEMP (Document reference 7.7, DCO Volume 7). Water from these run to waste scenarios would then be released using the existing Eastney TT, Eastney PS and Eastney LSO, however, this would not increase the volume of water released from the existing Eastney LSO above the volumes set out in section 3.6 in ES Chapter 3 Description of Proposed Development, Volume I (Document reference 6.1, DCO Volume 6). With implementation of these measures, the implications of the run to waste scenarios of the WRP during operation and impact magnitude of changes in water release from Eastney LSO are considered as being negligible.

9.8.105 Given the insignificant changes predicted in the currently consented water quality parameters and dilution of the chemicals in the immediate vicinity of the Eastney LSO, as shown by water quality modelling results and distance required for dilution to EQS concentrations for the chemical parameters screened in, the release from Eastney LSO associated with WRP operation would not result in any significant changes to water quality, and changes would not extend into connected water bodies such as Langstone Harbour, Chichester Harbour or the tidally influenced Hermitage Stream. Impact magnitude on water quality by changes in water release from the Eastney LSO is therefore considered negligible.

Designated sites

9.8.106 Internationally designated sites are recognised as being of very high importance. Solent and Dorset Coast SPA (designated for breeding terns) is the closest

designated site, as the Eastney LSO is within this SPA. South Wight Maritime SAC (designated for reefs, vegetated sea cliffs and submerged sea caves) is approximately 2.9km from the Eastney LSO. Bembridge MCZ, a national designation, is approximately 2km from the Eastney LSO and it is considered as being of high importance. As discussed in paragraphs 9.8.99 to 9.8.105, the impact magnitude is negligible, therefore, the effect of changes in water release from the Eastney LSO on designated sites with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Marine mammals

9.8.107 Marine mammals, in particular harbour porpoise and bottlenose dolphin may occur around the Eastney LSO, as they are regularly observed around the Solent. Marine mammals are protected under international convention and recognised as being of very high importance. As discussed in paragraphs 9.8.99 to 9.8.105, the impact magnitude is negligible, therefore, the effect of changes in water released from the Eastney LSO on marine mammals with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Fish

9.8.108 Various fish species recorded within study area 2 are protected at an international level (recognised as OSPAR threatened and/or declining species) and considered as being of very high importance, while some are species of principal importance in England and considered as being of high importance. As discussed in paragraphs 9.8.99 to 9.8.105, the potential for bioaccumulation is considered unlikely to be significant and the scale of change in bioaccumulation is considered to be negligible, the impact magnitude is negligible. Therefore, the effect of changes in water released from the Eastney LSO on fish with the highest level of importance (i.e., very high) is considered to be a minor adverse effect at most, and not significant.

Marine habitats

9.8.109 Subtidal habitats in the Eastney LSO area potentially include subtidal sands and gravels that is listed as a habitat of principal importance in England and thus considered to be of high importance. As discussed in paragraphs 9.8.99 to 9.8.105, the impact magnitude is negligible, therefore, the effect of changes in water release from the Eastney LSO on marine habitats with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Benthic marine species

9.8.110 Benthic marine species in the Eastney LSO area potentially include peacock's tail, which was not observed in the baseline but included for a precautionary approach and therefore, considered as being present. This species is listed in species of principal importance in England, and thus this is considered as being of high importance. As discussed in paragraphs 9.8.99 to 9.8.105, the impact magnitude is negligible, therefore, the effect of changes in water release from the Eastney LSO on benthic marine species with the highest level of importance (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Fisheries

9.8.111 The majority of fisheries target species within study area 2 are mobile, such as whelk, with limited mobility generally less than 1m per day, and some, including mackerel and herring, are highly mobile within a broad regional area. They are likely to be reliant upon a variety of habitats across study area 2. Commercial fisheries species including scallops, sole and sea bass (which were also recorded from the eDNA sampling and analysis) rely on the benthic communities as a food source. The vulnerability of these fisheries receptors is regarded as high. However, the impact magnitude is negligible as discussed in paragraphs 9.8.99 to 9.8.105, and also there are no likely significant effects on the benthic communities which are food source of fisheries species, the effect of changes in water released from the Eastney LSO on fisheries with the highest level of vulnerability (i.e., high) is considered to be a minor adverse effect at most, and not significant.

Decommissioning

9.8.112 As mentioned in section 9.5, the Applicant is not seeking consent for decommissioning of the Proposed Development. The assessment of decommissioning effects assumes that works will follow good industry practice and would comply with all relevant statutory requirements applicable at the time. Effects from decommissioning are considered to be no greater than those identified during the construction phase and are therefore assessed as being the same as construction effects. The significance effects resulting from decommissioning is therefore considered the same as reported as for the construction effects as presented in this section 9.8.

9.9 Mitigation and monitoring

9.9.1 Mitigation measures are defined in ES Chapter 5 EIA approach and methodology, Volume I (Document reference 6.1, DCO Volume 6) with primary mitigation and tertiary mitigation for marine biodiversity being presented in section 9.4 of this chapter.

Secondary mitigation

9.9.2 The assessment has not indicated that likely significant effects would result from the Proposed Development with regard to the marine environment. As such no secondary mitigation is required.

Monitoring

9.9.3 There are no proposed monitoring requirements with respect to marine biodiversity. Water quality monitoring of surface water receptors including Hermitage Stream and Langstone Harbour has been proposed in the ES Appendix 19.9 Outline Water Monitoring Plan, Volume II (Document reference 6.2, DCO Volume 6) that would verify the implemented tertiary mitigation measures.

9.10 Summary of residual effects

9.10.1 Table 9-29 provides a summary of the residual effects relating to the construction, operation and decommissioning of the Proposed Development with regard to marine biodiversity receptors.

9.10.2 During construction, the assessment of effects identified that with application of good construction practices (e.g. pollution control measures, noise dampening technology, good construction site management practices) as set out within the Outline CEMP (Document reference 7.1, DCO Volume 7) of the Proposed Development, potential residual effects on marine biodiversity are not considered to be significant.

9.10.3 During operation, water released from the SuDS outfall and the change in water quality of Hermitage Stream from releases of compensatory flows from HTR as a result of the Proposed Development are not considered to have any significant effects on the marine biodiversity of the Hermitage Stream and Langstone Harbour. Changes in water quality from the reject water released from the Eastney LSO during operation are not considered to cause any likely significant effects. Therefore, there would be no residual significant effects on marine biodiversity during the operation phase.

9.10.4 During decommissioning, with the implementation of pollution control measures and good construction site management subject to the relevant permits/consents and regulatory environment at the time, there would be no significant residual effects on marine biodiversity.

Table 9-29 Summary of residual effects

Impact	Receptor	Residual effects		
		Construction	Operation	Decommissioning
Pollution events	Designated sites	Minor adverse (not significant)	Scoped out	Minor adverse (not significant)
	Marine mammals	Minor adverse (not significant)		
	Fish	Minor adverse (not significant)		
	Marine habitats	Minor adverse (not significant)		
	Benthic marine species	Minor adverse (not significant)		
	Fisheries	Minor adverse (not significant)		
Underwater noise and vibration	Designated sites	Minor adverse (not significant)	Scoped out	Scoped out
	Marine mammals	Minor adverse (not significant)		
	Fish	Minor adverse (not significant)		
	Marine habitats	Scoped out		

Impact	Receptor	Residual effects		
		Construction	Operation	Decommissioning
	Benthic marine species	Minor adverse (not significant)		
	Fisheries	Minor adverse (not significant)		
Habitat loss	Designated sites	Minor adverse (not significant)	Scoped out	Minor adverse (not significant)
	Marine mammals	Minor adverse (not significant)		
	Fish	Minor adverse (not significant)		
	Marine habitats	Minor adverse (not significant)		
	Benthic marine species	Minor adverse (not significant)		
	Fisheries	Minor adverse (not significant)		
Introduction of INNS	Designated sites	Minor adverse (not significant)	Minor adverse (not significant)	Minor adverse (not significant)
	Marine mammals	Minor adverse (not significant)	Minor adverse (not significant)	
	Fish	Minor adverse (not significant)	Minor adverse (not significant)	
	Marine habitats	Minor adverse (not significant)	Minor adverse (not significant)	
	Benthic marine species	Minor adverse (not significant)	Minor adverse (not significant)	
	Fisheries	Minor adverse (not significant)	Minor adverse (not significant)	
Light disturbance	Designated sites	Minor adverse (not significant)	Minor adverse (not significant)	Minor adverse (not significant)
	Marine mammals	Scoped out	Scoped out	
	Fish	Scoped out	Scoped out	
	Marine habitats	Minor adverse (not significant)	Minor adverse (not significant)	
	Benthic marine species	Minor adverse (not significant)	Minor adverse (not significant)	
	Fisheries	Minor adverse (not significant)	Minor adverse (not significant)	
Construction effect of increased sedimentation	Designated sites	Minor adverse (not significant)	Scoped out	Minor adverse (not significant)
	Marine mammals	Minor adverse (not significant)		

Impact	Receptor	Residual effects		
		Construction	Operation	Decommissioning
associated with the SuDS outfall	Fish	Minor adverse (not significant)		
	Marine habitats	Minor adverse (not significant)		
	Benthic marine species	Minor adverse (not significant)		
	Fisheries	Minor adverse (not significant)		
Operational effect of freshwater influence from SuDS outfall into the Hermitage Stream	Designated sites	Scoped out	Minor adverse (not significant)	Scoped out
	Marine mammals		Minor adverse (not significant)	
	Fish		Minor adverse (not significant)	
	Marine habitats		Minor adverse (not significant)	
	Benthic marine species		Minor adverse (not significant)	
	Fisheries		Minor adverse (not significant)	
Operational effect of changes in water quality of Hermitage Stream from releases of compensatory flows from Havant Thicket Reservoir	Designated sites	Scoped out	Minor adverse (not significant)	Scoped out
	Marine mammals		Minor adverse (not significant)	
	Fish		Minor adverse (not significant)	
	Marine habitats		Minor adverse (not significant)	
	Benthic marine species		Minor adverse (not significant)	
	Fisheries		Minor adverse (not significant)	
Changes in water release from Eastney LSO during operation	Designated sites	Scoped out	Minor adverse (not significant)	Scoped out
	Marine mammals		Minor adverse (not significant)	
	Fish		Minor adverse (not significant)	
	Marine habitats		Minor adverse (not significant)	
	Benthic marine species		Minor adverse (not significant)	
	Fisheries		Minor adverse (not significant)	

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