Havant BOROUGH COUNCIL

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Langstone Flood and Coastal Erosion Risk Management (FCERM) Scheme

Information for Habitats Regulations Assessment

November 2026

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EXECUTIVE SUMMARY

This Information for Habitats Regulations Assessment (HRA) has been prepared to support the applications for planning permission and a marine licence for the Langstone Flood and Coastal Erosion Risk Management (FCERM) Scheme. This report provides the information required to enable the Competent Authorities (Havant Borough Council and the Marine Management Organisation) to determine the implications of the Langstone FCERM Scheme on the relevant National Site Network nature conservation sites and their interest features.

This report provides an overview of the HRA process and details the methodology followed for the assessment of the Langstone FCERM Scheme. It includes a summary of the proposed works, information on the relevant European sites and their interest features, screening of the scheme activities and potential effect pathways, and assessment of whether the proposed scheme will have an adverse effect on the integrity of the relevant National Site Network sites.

Where potentially significant adverse effects were identified, mitigation measures have been proposed to ensure the protection of the designated site features. The appropriate assessments indicate that, providing the proposed mitigation measures are secured, the construction phase of the Langstone FCERM Scheme will not have an adverse effect on the attributes of the Solent Maritime Special Area of Conservation (SAC) or the Chichester and Langstone Harbours Special Protection Area (SPA) and Ramsar site. During the construction works, the incorporated mitigation measures will prevent disturbance of SPA/Ramsar birds and ensure that the water quality and habitats within the harbours are not adversely affected.

However, in the operational phase, the permanent loss of intertidal habitat under the footprint of the new sea wall structures (172m^2), and from coastal squeeze over the lifetime of the scheme, will result in an adverse effect on the extent and distribution attribute of the sites' conservation objectives for the Estuaries, Mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows and Spartina swards SAC features and the intertidal sediment and saltmarsh SPA/Ramsar supporting habitats.

As the North Solent Shoreline Management Plan (SMP) and the Portchester to Emsworth Coastal Strategy (PEMS) have already been through the HRA process and the derogation tests under Article 6(4) of the Habitats Directive, the Secretary of State has already approved the plan and the decision to have a coastal defence at this location (i.e., to Hold the Line (HTL)). Another derogation is not required for the Langstone FCERM Scheme as the alternatives and IROPI tests have already been agreed at the plan and strategic level.

The design of the new sea defences at Langstone has been developed ensuring the that least encroaching viable option is taken forward (to prevent unavoidable encroachment of the FCERM structures into the designated sites). The Environment Agency's Habitat Compensation and Restoration Programme (HCRP) has already been approved by the Secretary of State as the agreed compensatory mechanism for habitat losses caused by coastal squeeze due to the HTL policies within the North Solent SMP and the PEMS. As the Langstone FCERM Scheme is implementing the SMP and strategic policy, it follows that any unforeseen and unavoidable additional compensatory requirements arising at the scheme level can be included within this compensatory mechanism to ensure the overall ecological coherence of the European site network. This approach has been previously supported by

Defra and Natural England for the North Portsea Island FCERM Scheme (see **Annex B4 and Annex B5**).

The 172m^2 intertidal sediment habitat loss from the footprint of the new defence structures in Frontages 3, 4 and 5 of the Langstone FCERM Scheme will be added to the Solent and South Downs HCRP balance sheet to ensure that the required additional compensation is captured within the HCRP targets.

ACRONYMS

AA	Appropriate Assessment
AEOI	Adverse Effect on Integrity
AEP	Annual Exceedance Probability
AoO	Advice on Operations
CEMP	Construction Environmental Management Plan
EIA	Environmental Impact Assessment
EMS	European Marine Site
ES	Environmental Statement
FAP	Feature-Activity-Pressure (interactions)
FCERM	Flood and Coastal Erosion Risk Management
HBC	Havant Borough Council
HCRP	Habitat Compensation and Restoration Programme
HLCO	High Level Conservation Objectives
HRA	Habitat Regulations Assessment
HTL	Hold the Line
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
LSE	Likely Significant Effect
MMO	Marine Management Organisation
MPA	Marine Protected Area
PDAS	Planning, Design and Access Statement
PEMS	Portchester Castle to Emsworth Coastal Strategy
SAC	Special Areas of Conservation
SACO	Supplementary Advice on Conservation Objectives
SCI	Sites of Community Importance
SMP	Shoreline Management Plan
SoP	Standard of Protection
SPA	Special Protection Area
TLSE	Test of Likely Significant Effect

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1. Introduction

1.1 Background to the Langstone FCERM Scheme

The second round of the North Solent Shoreline Management Plan (SMP) was formally adopted in 2010. The SMP policy unit covering Langstone Village is 5a18 and the SMP set a policy of Hold the Line (HTL) for all three epochs (i.e. from 2005 until 2105) for this section of coastline.

Following on from the SMP, the Portchester Castle to Emsworth Flood and Erosion Management Strategy (PEMS) was approved in 2013. The PEMS confirmed the North Solent SMP policy for Hold the Line and recommended improvements to the defences at Langstone. The PEMS recommended upgrading the existing defences to increase the current Standard of Protection (SoP) to a minimum 1.3% Annual Exceedance Probability (AEP) (1 in 75 year) to reduce the risk of flooding to residential properties and the approach to Langstone Bridge (the only mainland road link to Hayling Island).

The location of the Langstone FCERM Scheme is shown in **Figure 1.1** and the site location plan (drawing LP1). The assets at risk from flooding from a 0.5% AEP (1 in 200 year) tidal flood event (present day) include:

- 53 residential properties
- 4 non-residential properties
- Critical infrastructure including the A3023 road crossing to Hayling Island
- Heritage assets

Due to sea level rise, by 2040 it is predicted that this will increase to 59 residential properties and 4 non-residential properties at risk from a 0.5% AEP (1 in 200) year event.

The current defences along the frontage consist of a mixture of concrete walls, concrete block revetments and masonry quay walls which are in a poor and degraded condition. Currently maintained by Havant Borough Council (HBC), Hampshire County Council (HCC) and other private owners, the majority of the current defences have residual lives of less than five years (without any maintenance) and therefore, without a scheme at Langstone, the community will continue to be at significant flood and erosion risk.

The PEMS identified that the defences at Langstone would require capital improvements within the first ten years of the Strategy. Following a thorough assessment of Flood and Coastal Erosion Risk Management (FCERM) options for the Langstone frontage, final leading options were selected and taken forward to the detailed design stage to deliver the SMP and Strategic policy of HTL.

The Langstone FCERM Scheme covers approximately 1 km length of coastline and has been divided into five frontages as shown on **Figure 1.1**, to enable a targeted design for each section of the defences. Further information on the options appraisal and the proposed detailed design for the Scheme is summarised in **Section 3** of this Information for HRA.

1.2 Information for Habitats Regulations Assessment

This report provides the information required to enable the competent authorities to determine the implications of the proposed Langstone FCERM Scheme on the relevant National Site Network sites (previously known as European sites) and their nature conservation interests. It has been guided by the Environmental Scoping Report for the Scheme and our Regulator's opinions on this.

On 31 March 2021 we received a Scoping Opinion under and the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) from HBC as the Local Planning Authority (LPA). On 20 May 2021 we received a Scoping Opinion under the Marine Works (Environmental Impact Assessment) Regulations 2017 (as amended) from the Marine Management Organisation (MMO), together with clarifications in their letter dated 07 July 2021. The Scoping Opinions are included in **Appendix A of the ES**. The Scoping Opinions were based on the outline designs and Environmental Scoping Report that was developed for the Langstone FCERM Scheme in 2020. The Environmental Impact Assessment (EIA) Scoping included both the Core and Additional parts of the Scheme (as described in **Section 3.1 of the ES**). However, at the current time, funding has only been secured for the Core scheme of works comprising Frontages 1A, 2, 3, 4 and 5. Therefore, **this 'Information for HRA' and the associated consent applications that it supports, are for the Core Scheme works only, as shown in Figure 1.1 below.**

This Information for HRA is structured to present a view as to whether the proposed Langstone FCERM Scheme will (either alone or in-combination with other plans or projects) have an adverse effect on the integrity (AEOI) of the designated National Site Network nature conservation interests and the objectives that apply to these interests. The assessment process is explained below but, in summary, the following is provided:

- An overview of the HRA process and methodology for assessment;
- Information on the proposed Langstone FCERM Scheme;
- Background information regarding the relevant National Site Network sites;
- Screening of impacts and Likely Significant Effects (LSE);
- Assessment of impacts on the integrity of the relevant National Site Network sites;
- Consideration of alternative options that could avoid or have a lesser effect on the National Site Network sites;
- Imperative reasons of over-riding public interest; and
- Compensatory measures.

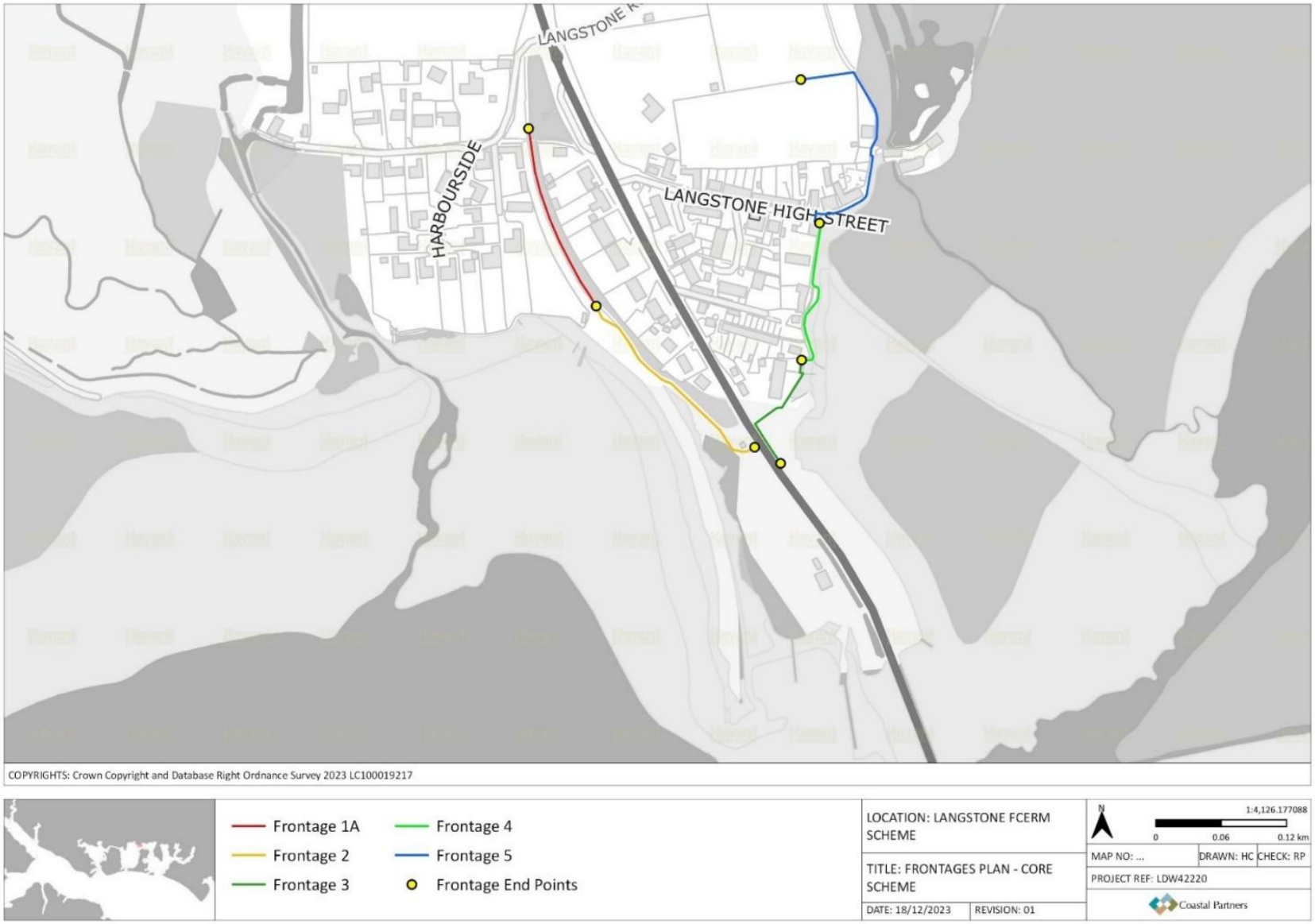

Figure 1.1: The location and extent of the Langstone FCERM Scheme.

2. Overview of the Habitat Regulations Assessment Process and Methodology

2.1 Overview of the Habitat Regulations

The 'Habitats Directive' (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) protects habitats and species of European nature conservation importance. Together with Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive'), the Habitats Directive establishes a network of internationally important sites designated for their ecological status. Special Areas of Conservation (SACs) and Sites of Community Importance (SCIs) are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas (SPAs) are designated under the Birds Directive to protect rare, vulnerable and migratory birds. These sites combine to create a Europe-wide network of designated sites, referred to as 'European sites'.

In the United Kingdom (UK), the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') incorporate all SPAs into the definition of European sites and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive and both SACs/SCIs and SPAs are included within the UK National Site Network of European sites.

In addition to sites designated under the Habitats Regulations, UK Government policy (ODPM Circular 06/2005) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them.

Regulation 63 of the Habitats Regulations defines the procedure for the assessment of the implications of plans or projects on European sites (the Habitats Regulations Assessment (HRA) process). Under this Regulation, if a proposed development is unconnected with site management and is likely to significantly affect the designated site, the competent authority must undertake an 'appropriate assessment' (Regulation 63(1)).

The UK left the European Union on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). However, the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 make it clear that the HRA process continues to apply following the UK's exit.

2.2 The Habitat Regulations Assessment Process

In line with published guidance (EU Commission, 2021; DEFRA, 2023), the Langstone FCERM Scheme has been assessed in the following stepwise approach under the Habitat Regulations:

- **Stage 1 - Screening:** This stage includes two steps. The first step is the 'Management Test' to determine whether or not a proposal is directly connected with or necessary to site management for nature conservation. The second step in this stage is the 'Test of Likely Significant Effect (TLSE)', which determines whether a proposal is likely to have a significant effect on the internationally important interest features of the European site(s), either alone or in combination with other plans and projects.

- **Stage 2 - Appropriate Assessment and Integrity Test:** If a plan or project is not necessary for the conservation management of the European site and a LSE cannot be excluded, the competent authority must undertake an appropriate assessment of the project. This stage assesses in detail the implications of the effects of the proposal on the site's conservation objectives and whether or not the proposal will adversely affect the integrity of the site, either alone or in combination with other plans and projects. Where adverse effects are identified, conditions or other restrictions can be added to the consent to enable the competent authority to determine that the proposal will not have an Adverse Effect on the Integrity (AEOI) of the European site(s), either alone or in combination with other plans or projects. If mitigation measures and conditions or restrictions cannot avoid an adverse effect on the integrity of the site(s), then consent can only be granted if stages 3 and 4 (below) are followed and a 'derogation' is approved by the Secretary of State.

- **Stage 3 - Alternative Solutions:** This stage of the assessment examines alternative ways of achieving the objectives of the plan or project to establish whether there are any financially, legally and technically feasible solutions that would avoid or have a lesser adverse effect on the integrity of the European site(s).

- **Stage 4 - Imperative Reasons of Overriding Public Interest (IROPI) and Compensatory Measures**: This stage assesses whether the reasons for undertaking the plan or project are imperative (for health and safety and/or socio-economic reasons) and in the public interest. If IROPI can be demonstrated, and the necessary compensatory measures have been secured to ensure the overall coherence of the European site network is maintained, then permission may be granted.

These stages must be followed in order as part of the stepwise approach to a HRA. The four stages are distinct and mark the points at which plans or projects may no longer need further assessment work to be undertaken.

2.3 Methodology for Assessment of the Langstone FCERM Scheme

As the Government's statutory nature conservation adviser, Natural England has a duty, under Regulation 37 of the Habitats Regulations, to produce conservation advice for European Marine Sites (EMS). Natural England is currently updating its conservation advice packages and some new packages are still in draft and being consulted on and, therefore, may be subject to change. However, the new draft advice reflects the most up-to-date evidence held by Natural England.

The conservation advice package for each European site includes specific information on the designated or qualifying features, conservation objectives, advice on operations (how an activity can affect a protected site feature) and advice on the seasonal sensitivity of any mobile species features. To accompany the updated conservation advice, Natural England has produced guidance on how to use the new advice packages when providing information for HRA (Natural England, 2021). This guidance advises that there are several steps to go through when using the conservation advice to assess if an activity will impact a site. In summary, these are:

1) **Use the Site Information and maps** to determine if the plan or project is in, or near to, an EMS;

2) **Use the Advice on Operations** (AoO) to determine potential interactions between protected features and the activities within the proposed plan or project. Identify the pressures that the activities will cause that could impact the habitats and/or species features of the site;

3) **Screen the Feature-Activity-Pressure (FAP) interactions** identified in step 2. 'Not relevant' interactions can be screened out of any further assessment. 'Not sensitive' interactions can be screened out as long as the pressure level resulting from the proposed activity will not exceed the defined benchmark in the AoO. In addition to sensitivity, pressures have also been risk profiled within the AoO. Unless there are evidence based case or site-specific factors that increase the risk or uncertainty on the level of the pressure on a receptor, 'Low Risk' pressures generally do not occur at a level of concern and should not require further consideration as part of an assessment. However, before screening out low risk pressures, consideration should be given to the activities within the proposed plan or project to ensure that there are no site-specific factors under which the risk associated with the pressure could increase;

4) **Use the Conservation Objectives and the Supplementary Advice** to assess the impacts of the proposed plan or project on the attributes of each protected feature.

5) **Bring this together in an assessment of the overall impacts** on the features of the European site(s) to determine whether or not the proposed plan or project will have an AEOI of the European site(s) in view of the Conservation Objectives.

Steps 1 to 3 represent the TLSE in the Screening Stage of the HRA process and Steps 4 to 5 comprise the Appropriate Assessment and Integrity Test stage.

3. Description of the Langstone FCERM Scheme

3.1 Background to the Scheme and Options Appraisal

As described in **Section 1.1**, the need for new coastal defences at Langstone was identified in the PEMS to provide a recommended minimum 1.3% AEP standard of protection for this frontage. The proposed scheme that has been developed will provide a 0.5% AEP standard of protection to 57 properties at risk today and critical infrastructure (the A3023 road crossing to Hayling Island) with a 50-year design life.

A description of the background to the development of the Langstone FCERM Scheme is provided in **Chapter 2 of the ES (Statement of Need and Strategic Background)**. In order to deliver the SMP and PEMS policy of 'Hold the Line' for Langstone Village, considerable effort has been invested into selecting the leading design options, as described in **Chapter 4 of the ES (Consideration of Alternatives)**. Between 2018 and 2020, a thorough options appraisal process was undertaken, in accordance with FCERM appraisal guidance (FCERM-AG), to select the leading option for each section of the Langstone frontage.

The Langstone frontage is characterised by landward space constraints, an environmentally designated foreshore which limits the potential for encroachment, heritage / landscape constraints and substantial local variation in the orientation and character of the shoreline. It is therefore unfeasible for the scheme to comprise just one defence type across the frontage. As a result, a wide variety of defence types were considered in the option appraisal process for each location along the Scheme frontage.

Stage one of the option development and appraisal process involved developing a long list of options (AECOM, 2018a). The long list of options included:

- **Do Nothing** – no active intervention.
- **Do Minimum** – Patch and repair or small-scale maintenance.
- **Options to maintain** – Capital refurbishment, localised erosion protection, beach recycling / management.
- **Options to sustain / improve** – crest raising, setback floodwall, glass floodwall, self-raising floodwall, temporary barriers, demountable floodwall, reinforce de-facto defences, boundary walls and flood proof buildings, flood gates, wave return wall, setback embankment, land raising, road raising, concrete revetment / seawall, sheet piling with capping beam, beach nourishment, beach groynes, property level resilience, vegetated buffer zones.
- **Frontage wide options** – tidal flood barrier, lagoon, community preparedness and resilience, relocation.

From this long list, options that were impractical, technically flawed or environmentally unacceptable were screened out. The refined long list of options was then assessed using Critical Success Factors (CSF) and a multivariate appraisal to identify the most suitable options for each frontage of the Scheme (AECOM, 2018b).

This resulted in short-listed scheme options, which were deliverable on economic, social, environmental and technical grounds. The short-listed options for each frontage of the Langstone FCERM Scheme are listed below in **Table 3.1**.

Table 3.1: Short List options for each frontage of the Langstone FCERM Scheme

Frontage	Short List Options
1A and 2 (Billy Line)	○ Setback floodwall ○ Setback earth embankment
3 (A3023 to The Look Out)	○ Flip-up floodwall ○ Demountable defences ○ Flood gate ○ Setback flood wall with/without a glass crest (around edge of car park) ○ Flip-up floodwall (across car park) ○ Vertical floodwall with glass crest
4 (The Look Out to The Winklemarket)	○ Setback floodwall adjacent to the garden wall, with a timber boardwalk in-front of the footpath ○ Replace / reinforce the existing garden walls at the back of the footpath ○ Flip-up floodwall adjacent to the footpath ○ Demountable defences adjacent to the footpath ○ Frontline vertical floodwall with glass crest ○ Floodwall with a boardwalk (front of grassed area) ○ Self-raising flood barrier (front of grassed area) ○ Flood proofing of the existing residential building (at the Winklemarket)
5 (High Street to Field North of Royal Oak)	○ Flip-up floodwall ○ Demountable defences ○ Flood gate ○ Flip-up flood barrier defence ○ Frontline floodwall of the existing defences ○ Flood proofing the walls of the Royal Oak and adjacent buildings and reinforce or replace the garden / boundary walls ○ Setback floodwall ○ Setback floodwall and earth embankment (earth embankment where space allows)

These short-listed options were then analysed further in order to select a leading option for each frontage of the Scheme (AECOM, 2019a). The short-listed options were appraised, scored and ranked against environmental and social impacts, technical feasibility and cost. To inform the selection of the leading option for each frontage, site meetings and discussions were held with Natural England and the Environment Agency, and a stakeholder workshop was held. Selection of the final leading options was based heavily on the environmental impacts of each option, taking advice from our statutory and wider stakeholders and technical experts.

The leading options were then developed into outline designs (AECOM, 2019b). Between 2021 and early 2025, the outline designs were refined and developed into the full detailed design for the Scheme. The final proposed Scheme design is described below in **Section 3.2**.

3.2 Description of the Recommended Options and Detailed Design for the Langstone FCERM Scheme

The proposed design for the Langstone FCERM Scheme is described in detail in the **Planning, Design and Access Statement (PDAS)** and the associated **drawing pack** and in **Chapter 3 of the ES (Proposed Scheme)**. The proposed design has been assessed within this HRA using information from the **EIA** of the proposed scheme and information on the relevant European sites (as presented in **Section 4** of this document).

The design life of the proposed scheme is 50 years, and it will provide a present-day SoP of 0.5% AEP (1:200-year return period event). This SoP exceeds the minimum recommendation of the PEMS (1.3% AEP) in the present day, however the SoP will decline over time as a function of sea level rise. By year 50, based on UKCP18 sea level rise projections, the scheme is expected to have a SoP of between 1.3% AEP (1:75 year) and 20% AEP (1:5 year), but climate predictions become more uncertain into the future. Providing a present-day 0.5% AEP (1:200 year) SoP against still water level flooding is the key objective of the scheme and it has been recognised that there is no appetite from the community in Langstone to further increase the flood defence level due to landscape and visual impacts. Further details are provided in the preferred option report (AECOM, 2019a).

In summary, the proposed coastal defences at Langstone Village consist of a mix of earth bunds, reinforced concrete sea walls and sheet pile walls as described below:

- **Frontage 1A: Billy Line North.** The flood defence comprises of a raised earth embankment and follows the line of the existing Billy Line cycleway (a National Cycle Route 2 cycleway). The existing cycle path is to be upgraded to a new 3 metre wide shared path for pedestrians and cyclists which sits on top of the flood embankment.

- **Frontage 2: Billy Line South.** The design for Frontage 2 consists of a sheet-piled wall. Raised earth embankments are included where the defence alignment needs to cross existing utility pipes. The existing cycle path is to be upgraded to a new 3 metre wide shared path for pedestrians and cyclists which sits adjacent to the sheet-piled wall. Frontage 2 ties in with Frontage 1A and the existing higher levels on the A3023 road.

- **Frontage 3: A3023 road to 9 Coastguard Cottages (The Look Out).** Frontage 3 consists of a continuous flood defence that largely comprises of four flood defence structures. These structures include the A3023 flood wall, Ship Inn car park raised earth bund, Ship Inn flood wall and Ship Inn Annex flood wall. A flood gate is also to be provided between the Ship Inn and the Ship Inn Annex flood walls.

- **Frontage 4: The Look Out to No. 24 Langstone High Street (the Winklemarket).** Frontage 4 consists of new reinforced concrete flood walls in front of the existing garden walls that run along the frontage. The existing footpath is to be upgraded to a new 1.5 metre wide footpath through the construction of a new quay wall, to improve user accessibility of the route. One flood gate (at Green Cottage) and one demountable flood barrier (at the pedestrian access adjacent to the Watch Tower) will be provided to ensure robust continuity of the defence.

- **Frontage 5: Langstone High Street to the field north of the Royal Oak.** Frontage 5 consists of a continuous flood defence that largely comprises of five structures. These structures include the High Street flood gates, the Royal Oak flood wall, the allotment flood wall, the Footpath flood wall that runs west of the Mill Pond, and an earth embankment in the field north of the Royal Oak. Demountable flood barriers will be provided between the section transitions and flood gates will be provided at No.21 High Street.

For further detail on the proposed design for each frontage please refer to **Section 3.2 of the ES**, the general arrangement, cross sections, elevations and landscaping plans and **the Detailed Design Report (AECOM, 2024a) and the Materials Report (AECOM, 2024b)**.

Surface water drainage is proposed to be installed in conjunction with the defences in Frontages 2, 3, 4 and 5, as described in **Section 3.2.6 of the ES**, the **Drainage Strategy Report (AECOM, 2024c)** and shown on drawings LANG-ACM-SW-F2-DR-ZZ-011041, LANG-ACM-SW-F2-DR-ZZ-021042, LANG-ACM-SW-F2-DR-ZZ-021043, LANG-ACM-SW-F2-DR-ZZ-051044, LANG-ACM-SW-F3-DR-ZZ-011045, LANG-ACM-SW-F3-DR-ZZ-021046, LANG-ACM-SW-F3-DR-ZZ-051048, LANG-ACM-SW-F4-DR-ZZ-011049, LANG-ACM-SW-F4-DR-ZZ-021050, LANG-ACM-SW-F5-DR-ZZ-011051, LANG-ACM-SW-F5-DR-ZZ-021052 and LANG-ACM-SW-F5-DR-ZZ-051054. No formalised drainage is proposed to be installed in Frontage 1A as surface water will drain to either side of the raised embankment, similar to the existing drainage pathways in this frontage.

A main site compound will be set up that will remain in situ throughout the construction works, located in the fields to the north of the Royal Oak (Langstone Meadows) as shown on the Access and Compound Plan (drawing AC1). Two satellite compounds will also be required – one located in the Ship Inn car park and one within the Langstone Sailing Club boat storage area.

The main construction works for the proposed Scheme are expected to commence in April 2026, subject to all necessary approvals and funding being secured. Some earlier enabling works (such as setting up the main site compound, installation of the access route and site offices, welfare facilities, connection of services and potentially vegetation clearance and reptile translocation) may commence in summer 2025, subject to approvals.

The main construction works are due to commence in April 2027, following some enabling works such as vegetation clearance, service diversions and the setting up of the main compound in January-March 2027. The main construction programme is 6 months, (April-September). Some lower impact activities not requiring heavy machinery, such as terrestrial landscaping, may be undertaken during the autumn/winter months

4. Background Information on the Relevant European Sites

The Scoping Opinions received from HBC and the MMO in March and May 2021 respectively (see **Appendix A** of the ES) confirmed that the relevant European sites to be included in the HRA for the Langstone FCERM Scheme are:

- The Solent Maritime SAC; and
- The Chichester and Langstone Harbours SPA and Ramsar site.

The location and boundaries of the relevant European sites included in this HRA for the Langstone FCERM Scheme are shown in **Figure 4.1**. Details of these European sites and their reasons for designation are outlined in the following sections.

In addition to the designated European sites, the over-wintering bird features of the Chichester and Langstone Harbours SPA and Ramsar site also use areas outside of the site boundaries, namely for high tide feeding and roosting. These areas of functionally linked land are essential for supporting these features and maintaining the integrity of the Chichester and Langstone Harbours SPA and Ramsar site. As such, functionally linked land is viewed as supporting the designated site features due to the important role it plays in maintaining or restoring the protected species' populations at favourable conservation status. Therefore, it is imperative that potential effects on these areas from the proposed Scheme are also considered within the HRA. Details of these functionally linked areas are provided in **Section 4.3** as a requisite part of this background information on the relevant European sites.

The proposed Scheme is located over 6 km away from both the Solent and Dorset Coast SPA and the Portsmouth Harbour SPA and Ramsar site. Therefore, as confirmed in the HBC and MMO Scoping Opinions, these European sites have been screened out of the HRA for the Langstone FCERM Scheme as the distance of these sites from the proposed Scheme means that there is not likely to be an impact pathway to their classified features or their supporting habitat. Furthermore, the features of both the Solent and Dorset Coast SPA (foraging breeding terns) and the Portsmouth Harbour SPA/Ramsar site (over-wintering water birds) are also features of the Chichester and Langstone Harbours SPA and Ramsar site and therefore will be captured within the assessment in this HRA.



Figure 4.1: Location of the European sites relevant to the HRA of the Langstone FCERM scheme

4.1 Solent Maritime SAC

The Solent Maritime SAC is a unique suite of functionally linked estuaries and dynamic marine and estuarine habitats. The site has the largest number of small estuaries in the tightest cluster anywhere in Great Britain, with examples of coastal plain estuaries (Yar, Medina, King's Quay Shore and Hamble) and bar-built estuaries (Newtown Harbour, Beaulieu, Langstone Harbour, Chichester Harbour). Sediment habitats within the site include extensive areas of intertidal mudflats and sandflats, often supporting eelgrass (*Zostera* species), subtidal sandbanks, saltmarsh and natural shoreline transitions such as drift line vegetation (Natural England, 2020c).

The Solent Maritime SAC is designated under the Habitats Directive, due to the presence of the habitats and species set out in **Table 4.1**.

Table 4.1: Annex I habitats and Annex II species that are qualifying features of the Solent Maritime SAC (from Natural England, 2023a and JNCC, 2015).

SAC feature	Qualifying details
Annex I habitats that are a primary reason for the selection of this site:	
Estuaries	This site is considered to be one of the best areas in the United Kingdom for the estuaries feature. The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area. It is the only SAC within the UK to contain more than one physiographic estuary type, comprising four bar-built estuaries (Newtown Harbour, Beaulieu Estuary, Langstone Harbour and Chichester Harbour) and four coastal plain estuaries (Yar, Medina, Kings Quay Shore and the Hamble).
Spartina swards (*Spartina* spp.)	The Solent Maritime SAC is the only site in the UK where smooth cordgrass (*Spartina alterniflora*) is present. It is also one of only two sites where native small cordgrass (*Spartina maritima*) and Townsend's cordgrass (*Spartina townsendii*) are found. There are also extensive areas of common cordgrass (*Spartina anglica*) and, thus, all four *Spartina* species occur here in close proximity.
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	This site is considered to be one of the best areas in the United Kingdom. The Solent contains the second-largest aggregation of Atlantic salt meadows in south and south-west England. The Atlantic salt meadows of the Solent are notable as being representative of the ungrazed type and subsequently support a range of communities dominated by sea purslane (*Atriplex portulacoides*), common sea lavender (*Limonium vulgare*) and sea thrift (*Armeria maritima*), as well as common saltmarsh grass (*Puccinellia maritima*).
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:	
Sandbanks which are slightly covered by sea water all the time	Shallow sediment communities occur around the Solent and include subtidal seagrass beds (*Zostera marina*), which is a UK habitat of principal importance. Subtidal mud and sand is generally found in the estuaries including the Hamble, Medina, Yar and Beaulieu, whilst subtidal sand and gravel is more predominant along the open coast.

SAC feature	Qualifying details
	These subtidal sediments typically occur at depths of less than 20 metres below chart datum and are characterised by burrowing worms, crustaceans, bivalve molluscs and echinoderms, such as brittle stars and sea urchins. The subtidal sediments in the Solent also include substantial populations of the non-native slipper limpet (*Crepidula fornicata*).
Salicornia and other annuals colonizing mud and sand	The Solent Maritime SAC supports a significant presence of this pioneer saltmarsh habitat, which comprises glasswort (*Salicornia* species) and annual sea-blite (*Suaeda maritima*). Pioneer saltmarsh vegetation colonises intertidal mudflat and sandflats in areas protected from strong wave action.
Mudflats and sandflats not covered by seawater at low tide	The Solent Maritime SAC supports a significant presence of this feature. Intertidal mudflats and sandflats are found throughout the site and form much of the intertidal region. They support nationally rare seagrass beds (*Zostera* species and *Ruppia marina*). Mud communities are present in the most sheltered areas of the site and are dominated by worms, bivalve molluscs and the mud snail *Hydrobia ulvae*. Coarser sand and cobble communities are found on beaches on the more exposed open coast and embayment areas around the Solent, where wave action and / or strong tidal currents prevent the deposition of finer silt.
Coastal lagoons (priority feature)	The Solent Maritime SAC includes two coastal lagoons, which are both located on the Isle of Wight, namely Newtown Quay Lagoon and Yar Bridge Lagoon. Coastal lagoons are a priority habitat of European importance.
Annual vegetation of drift lines	The Solent Maritime SAC supports a significant area of vegetated drift lines (also known as strandline habitat or vegetated shingle). This is a rare habitat as its total extent in the UK is estimated to be less than 100 hectares. Two important drift line communities are present in the site. The first is dominated by spear-leaved orache (*Atriplex prostrata*) or grass-leaved orache (*Atriplex littoralis*) on the seaward side of the shingle. The second is a community dominated by sea sandwort (*Honkenya peploides*) and sea rocket (*Cakile maritima*) with associated perennial plants.
Perennial vegetation of stony banks	This site supports a significant presence of perennial vegetation of stony banks and, collectively with the annual vegetation of drift lines feature, is commonly referred to as vegetated shingle. Perennial vegetation develops on more stable (typically landward) shingle or stony substrates than the annual vegetation of drift lines habitat. There are several distinct perennial shingle community types present but most common is the curled dock (*Rumex crispus*) and yellow-horned poppy (*Glaucium flavum*) community or an associated transition or variation.
Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”)	The Solent Maritime SAC includes sand dune habitats at East Head and Pilsey Island in Chichester Harbour and at Norton Spit to the west of the Yar Estuary on the Isle of Wight.
Annex II species present as a qualifying feature, but not a primary reason for site selection:	

SAC feature	Qualifying details
Desmoulin`s whorl snail *Vertigo moulinsiana*	When the Solent Maritime SAC was designated in 2005 the site supported a small population of the rare Desmoulin's whorl snail in the freshwater fen and brackish reedbeds at the top of Fishbourne Channel in Chichester Harbour. However, the species was last recorded here in 2005 and no individuals were found during surveys in 2009 and 2010.

4.2 Chichester and Langstone Harbours - SPA and Ramsar

The large, sheltered estuarine basins of Chichester and Langstone Harbours comprise extensive sand and mudflats which are exposed at low tide. The harbour basin contains a wide range of coastal habitats supporting important plant and animal communities. The invertebrate-rich mudflats support extensive beds of algae (especially *Enteromorpha*[1] species) and eelgrasses. The Chichester and Langstone Harbours site is of particular significance for water birds, especially in migration periods and in winter (Natural England, 2019b). It also supports important colonies of breeding terns (*Sterna* species) during the summer months.

4.2.1 Chichester and Langstone Harbours SPA

Chichester and Langstone Harbours are of European importance and are classified as a SPA based on the criteria set out in **Table 4.2**. The total area of the SPA is 5,810.03 ha.

Table 4.2: Chichester and Langstone Harbours SPA site qualification information (from Natural England, 2023b).

Site qualification criteria	Qualifying details
This site qualifies under Article 4.1 of the Birds Directive by supporting populations of European importance of species listed on Annex I of the Directive	**During the breeding season the area regularly supports:**
	Little tern, *Sterna albifrons* - 109 pairs representing up to 5.7% of the UK breeding population (5 year mean 1982 – 1986).
	Common tern, *Sterna hirundo* - 126 pairs representing up to 1.1% of the UK breeding population (5 year mean 1982 – 1986).
	Sandwich tern, *Sterna sandvicensis* - 93 pairs representing up to 0.7% of the UK breeding population (5 year mean 2011 - 2015).
	Over winter the area regularly supports: (5 year peak mean 1982/83 - 1986/87 unless stated otherwise. Internationally important population percentages are taken from the original SPA citation.)
	Bar-tailed godwit, *Limosa lapponica* – 1,491 individuals representing up to 3.9% of the GB breeding population
This site also qualifies under Article 4.2 of the Directive	Northern pintail, *Anas acuta* – 323 individuals representing 1.1% of the GB population

[1] Now known as *Ulva* species

Site qualification criteria	Qualifying details
(79/409/EEC). Over winter the area regularly supports:	Northern shoveler, *Anas clypeata* – 124 individuals representing 0.7% of the GB population
	Eurasian teal, *Anas crecca* – 2,553 individuals representing 1% of the North-western Europe population
	Eurasian wigeon, *Anas penelope* – 3,947 individuals representing 0.9% of the GB population (5 year peak mean 2010/11 – 2014/15)
	Ruddy Turnstone, *Arenaria interpres* – 564 individuals representing 1.2% of the GB population
	Dark-bellied Brent Goose, *Branta bernicla bernicla* – 17,712 individuals representing 12% of the Western Siberia/Western Europe population
	Sanderling, *Calidris alba* – 407 individuals representing 3.1% of the Eastern Atlantic/Western & Southern Africa wintering population
	Dunlin, *Calidris alpina alpina* – 53,977 individuals representing 2.6% of the Northern Siberia/Europe/Western Africa population
	Common Ringed Plover, *Charadrius hiaticula* – 1,012 individuals representing 3% of the GB population
	Red-breasted merganser, *Mergus serrator* – 366 individuals representing 4.4% of the GB population (5 year peak mean 2010/11 – 2014/15)
	Eurasian Curlew, *Numenius arquata* – 2,937 individuals representing 2.1% of the GB population
	Grey Plover, *Pluvialis squatarola* – 3,271 individuals representing 3.9% of the Eastern Atlantic wintering population
	Common Shelduck, *Tadorna tadorna* – 4,287 individuals representing 4% of the North-western Europe population
	Common Redshank, *Tringa totanus* – 3,417 individuals representing 1.4% of the Eastern Atlantic wintering population
The area qualifies under Article 4.2 of the Birds Directive by regularly supporting at least 20,000 waterfowl.	Over winter, the area regularly supports 108,811 individual waterbirds including: Wigeon *Anas penelope*, Bar-tailed Godwit Limosa lapponica, Dark-bellied Brent Goose *Branta bernicla bernicla,* Common Ringed Plover *charadrius hiaticula*, Grey Plover *Pluvialis squatarola*, Dunlin *Calidris alpina alpina*, Redshank Tringa totanus, Shelduck *Tadorna tadorna*, Curlew *Numenius arquata*, Teal *Anas crecca*, Pintail *Anas acuta*, Shoveler *Anas clypeata*, Red-breasted Merganser *Mergus serrator*, Ruddy turnstone Arenaria interpres, Sanderling *Calidris alba*.

4.2.2 Chichester and Langstone Harbours Ramsar

Chichester and Langstone Harbours are designated as a Ramsar site, under the international Ramsar Convention, based on the criteria set out in **Table 4.3**.

Table 4.3: Chichester and Langstone Harbours Ramsar site qualification information (from Ramsar Information Sheet, JNCC, October 1987).

Ramsar Criterion	Qualifying details	
Ramsar criterion 1 – a representative, rare, or unique example of a natural or near-natural wetland type	Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.	
Ramsar criterion 5 – regularly supports 20,000 or more water birds	Assemblages of international importance: Species with peak counts in winter: 76,480 waterfowl (5 year peak mean 1998/99 - 2002/2003)	
Ramsar criterion 6 – species / populations occurring at levels of international importance	**Qualifying species / populations occurring at levels of international importance**	**Number of individuals (5 year peak mean 1998/9 - 2002/3)**
	Peak counts spring/autumn:	
	Ringed plover, *Charadrius hiaticula*	853 individuals, representing an average of 1.1% of the population
	Black-tailed godwit, *Limosa limosa islandica*	906 individuals, representing an average of 2.5% of the population
	Common redshank, *Tringa totanus totanus*	2,577 individuals, representing an average of 1% of the population
	Peak counts winter:	
	Dark-bellied Brent goose, *Branta bernicla bernicla*	12,987 individuals, representing an average of 6% of the population
	Common shelduck, *Tadorna tadorna*	1,468 individuals, representing an average of 1.8% of the GB population
	Grey plover, *Pluvialis squatarola*	3,043 individuals, representing an average of 1.2% of the population
	Dunlin, *Calidris alpina alpina*	33,436 individuals, representing an average of 2.5% of the population

4.3 Functionally Linked Land (SPA/Ramsar supporting habitat outside of the European sites)

As described earlier in **Section 4**, the over-wintering bird features of the Chichester and Langstone Harbours SPA and Ramsar site also use areas outside of the European site boundaries. They use these arable and grassland areas, especially during high tide periods,

for feeding and roosting and, as such, these areas are an important part of the functional integrity of the SPA and Ramsar site.

4.3.1 Solent Wader and Brent Goose Strategy (SWBGS) sites

Local Authorities in the Solent have worked collaboratively with other organisations for several years to protect the Solent's SPAs and Ramsar sites and the terrestrial sites used by SPA/Ramsar species. This started in 2002 with the publication and implementation of the original South East Hampshire Brent Goose Strategy (Wicks, 2002). This was updated with the 2010 Solent Waders and Brent Goose Strategy (King, 2010). In 2020, a new strategy was published, which significantly updates the previous strategy in terms of the data used to identify sites and the level of protection given (Whitfield, 2020).

The SWBGS is a non-statutory document that provides analysis and recommendations relating to strategic planning within and around the Solent coast with respect to the non-designated terrestrial sites that support the SPA/Ramsar wetlands and their bird populations. The SWBGS highlights that many of the important Brent Goose feeding sites and wader roost sites around the Solent fall outside of the European site boundaries (Whitfield, 2020), and a large proportion of the important bird sites are in flood risk areas as identified by the Environment Agency. The SWBGS sites adjacent to the proposed Scheme are shown in **Figure 4.2** below, together with their classifications.

4.3.2 Solent Bird Studies sites

The SWBGS does not categorise the importance and network value of high tide roosting and feeding sites within the SPA. However, the Solent Bird Studies (Nightingale et al., 2020) investigated the importance of the network of sites including those within the SPA with a particular focus on future flood and coastal erosion risk management strategies and schemes. The Solent Bird Studies sites within and adjacent to the proposed Scheme are shown in **Figure 4.3** below.

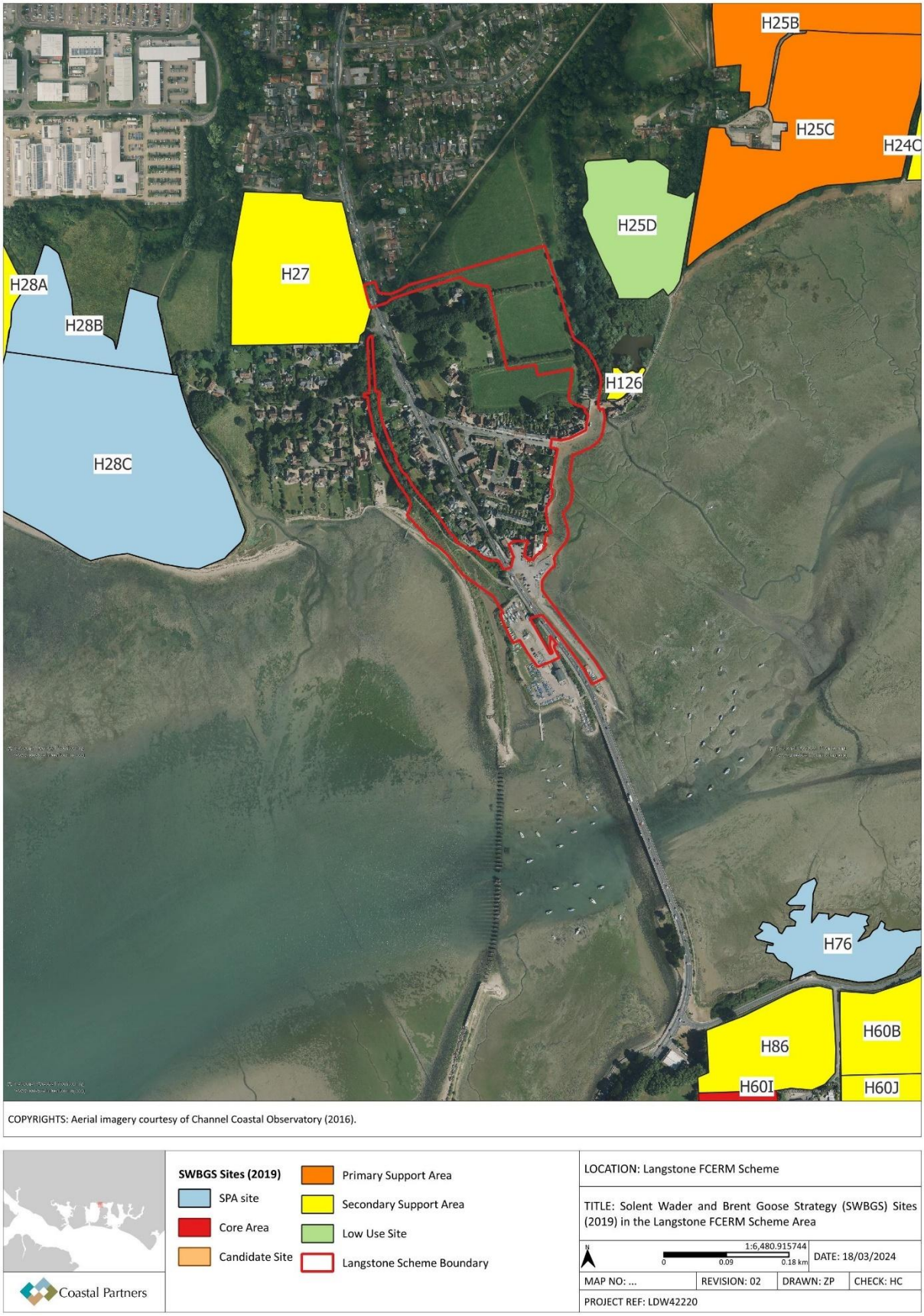

Figure 4.2: SWBGS sites in the Langstone FCERM Scheme area.



Figure 4.3: Solent Bird Studies sites in the Langstone FCERM Scheme area.

5. Stage 1 - Screening

The first stage of the HRA process is to screen the proposed plan or project to determine whether it is necessary for site management and whether it is likely to have a significant effect on the internationally important interest features of the European sites, either alone or in combination with other plans or projects. The initial HRA screening for the Langstone FCERM Scheme was undertaken in November 2020 following completion of the Outline Design and covered both the Core and Additional Schemes. Following refinement of the leading options and the development of the Detailed Design for the Scheme between April 2021 and January 2024, this HRA Screening has been updated to reflect any changes in the proposed works between outline and detailed design and the greater level of detail that is now known. Furthermore, the planning and marine licence applications that this Information for HRA is supporting are for consenting of the Core Scheme only (as described in **Chapter 3 of the ES**). Therefore, the HRA Screening has also been updated to cover only the Core Scheme (Frontages 1A, 2, 3, 4 and 5). The results of the updated HRA Screening assessment for the Langstone FCERM Scheme are presented in this section.

5.1 Management Test

The Langstone FCERM Scheme is not directly connected with or necessary for the management of all of the relevant European sites' qualifying features for nature conservation. Therefore, because the proposed scheme includes non-conservation elements, further assessment under the Habitats Regulations is required.

5.2 Test of Likely Significant Effect

The AoO component of Natural England's Conservation Advice for each relevant European site was used to identify activities within the proposed scheme that could interact with features of the protected sites. The relevant activities listed in the AoO that were identified for assessment in the TLSE for the Langstone FCERM Scheme are listed below in **Table 5.1**.

Table 5.1: Activities in the NE AoO that are relevant to the Langstone FCERM Scheme

Construction phase	Operational phase
Construction of coastal flood and erosion risk management schemes	Maintenance of hard coastal defences
Piling	Operation of coastal flood and erosion risk management schemes
Reclaim and land take (e.g. the footprint of coastal defences)	

For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages. Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests (Natural England, 2019). Therefore, the AoO for the Chichester and Langstone Harbours SPA has been used to cover both the SPA and the Ramsar interest features for the site in this HRA. All the Chichester and Langstone Harbours Ramsar features are qualifying species or supporting habitats of the Chichester and Langstone Harbours SPA, except for the godwit qualifying species – bar-tailed

godwit is a classified feature of the SPA whilst black-tailed godwit is a designated feature of the Ramsar site. However, the two species have similar ecology and therefore the SPA AoO provides adequate information for assessment of both features/protected sites.

5.2.1 Screening features and supporting habitats

Features, sub-features and SPA/Ramsar supporting habitats were screened out of requiring further assessment for all activities where there is no realistic pathway between the feature / sub-feature / supporting habitat and the activities within the proposed scheme. Features and supporting habitats that have been screened out of further assessment are listed in **Table** 5.2, together with their justification.

5.2.2 Screening low risk pressures

Pressures that are listed as 'Low risk' in the AoO were screened out, unless it was considered that there is a case-specific factor that could increase the risk of a pressure for the Langstone FCERM Scheme, in which case that low risk pressure was screened in for further assessment in accordance with the precautionary principle and Natural England guidance. The low risk pressures that have been screened out of further assessment for all activities and features / supporting habitats are listed in **Table 5.3**, together with their justification.

Table 5.2: Features and supporting habitats screened out of further assessment.

Feature / Supporting habitat	Justification
Coastal lagoons	There are only two coastal lagoons within the Solent Maritime SAC, which are both on the Isle of Wight and therefore will not be affected by the proposed Scheme. Shut Lake, located 3.3 km away from the Langstone frontage at Farlington Marshes, is a feature of the Solent and Isle of Wight Lagoons SAC. The isolated nature of the lagoon, which is located on the landward side of the Farlington sea wall (with water flow regulated by a tidal flap), means that there is unlikely to be an impact pathway to this receptor. Great Deep on Thorney Island in Chichester Harbour is not a true saline lagoon but is mapped as such on the Priority Habitat Inventory and, as it is within the SPA/Ramsar site, has therefore been considered as saline lagoon supporting habitat for the purpose of this HRA screening. However, Great Deep is located over 3 km away from the Langstone frontage and its semi-isolated nature (it is separated from the harbour at both ends by a sea wall with culverts) means that there is not likely to be an impact pathway to this receptor from the proposed Scheme.
Coastal reedbeds	The nearest reedbed habitat is located only 120 metres from the eastern end of proposed Scheme, to the north-east of the mill pond (ESCP, 2018). Whilst this area is not within the SPA/Ramsar site boundary, it provides functionally linked supporting habitat to passage and over-wintering SPA/Ramsar birds. However, the reedbed is not within the proposed works area and is located on the other side of The Old Mill pond. No works are proposed to The Old Mill as part of the Scheme, therefore there will be no impact on water flow or levels within the mill pond and, as such, the reedbed is not likely to be affected by the proposed Scheme. The reedbed habitat around Shut Lake at Farlington Marshes is located 2.8 km away from the proposed scheme and is isolated from the harbour by the Farlington sea wall and a sluice structure, therefore there is unlikely to be an impact pathway to this receptor. Reedbed is also present to the south of Emsworth marina on Thorney Island, but again, as this is located over 3 km from the proposed Scheme and the habitat is located on the landward side of the sea wall, there is unlikely to be an impact pathway to this receptor.
Desmoulin's whorl snail	The SAC Desmoulin's whorl snail feature is only present in the northern reaches of the Fishbourne Channel in Chichester Harbour. This is over 11 km away from the Langstone frontage, therefore there is unlikely to be any impact pathway to this receptor.
Shifting dunes along the shoreline with *Ammophila arenaria*	The SAC shifting dunes feature is only present at East Head on the eastern side of Chichester Harbour mouth, which is over 7 km from the Langstone frontage. The distance of this feature from the proposed works means there is unlikely to be any impact pathway to this receptor.
Subtidal seagrass beds	There are no subtidal seagrass beds present within Chichester or Langstone Harbours. The nearest subtidal seagrass beds are located in the open Solent off north coast of the Isle of Wight at Osborne Bay (over 19 km from the proposed Scheme) and at Lepe/Stansore Point off the New Forest coast (over 26 km from the proposed Scheme). Therefore, there is unlikely to be any impact pathway to this receptor.

Table 5.3: Low risk pressures screened out of further assessment.

Pressure (from NE AoO)	Justification
Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Construction activities for the proposed Scheme will generally be undertaken during daytime hours (7am to 7pm). However, due to the complexities of the project, occasional 24-hour working may be necessary. There will be no deliveries by sea; all materials and equipment will come via road so there is no risk of collisions between vessels and SPA/Ramsar birds. The new sea defences will be in approximately the same location as existing structures and buildings so are not likely to affect the foraging activities or flight paths of SPA/Ramsar birds. No new aerial structures are proposed that could introduce a collision risk for SPA/Ramsar birds. As such, the benchmark for the above water pressure is not triggered and the below water benchmark of a change of 0.1% of tidal volume on average tide, passing through an artificial structure, is not relevant to the proposed Scheme. No case specific factors have been identified that would increase the risk of these pressures for the Langstone FCERM scheme.
Collision BELOW water with static or moving objects not naturally found in the marine environment	
Introduction of light	Construction activities for the proposed Scheme will generally be undertaken during daytime hours (7am to 7pm). However, due to the complexities of the project, occasional 24-hour working may be necessary. Nonetheless, any lighting that is required for construction or maintenance activities is not likely to have a significant effect on the foraging or roosting activities of SPA/Ramsar birds or on the intertidal habitats in the harbour as the lighting would be highly localised and directed towards the defences/footpath working area. Lighting requirements for the operational scheme will be similar to existing levels and locations. No case specific factors have been identified that would increase the risk of this pressure for the Langstone FCERM scheme.
Introduction of other substances (solid, liquid or gas)	Best practice will be in place for construction site management and maintenance activities, which will minimise the risk of any spills from materials, equipment or re-fueling activities. Spill kits will be kept on site for use in case of any accidental spillage. This is included as standard in the Construction Environmental Management Plan (CEMP) for all Coastal Partners projects. No vessels will be used in the construction of the proposed Scheme. All materials to be used in the construction and maintenance of the new sea defences are suitable for use in the marine environment. There will be no changes to the catchment area of drainage outfalls/discharges, therefore, no releases of oil or fuel are likely from the operation of the proposed Scheme. No case specific factors have been identified that would increase the risk of this pressure for the Langstone FCERM scheme.
Introduction or spread of invasive non-native species (INNS)	Best practice will be in place for construction site management and maintenance activities, which will minimise the risk of introduction or spread of INNS. This is included as standard in the CEMP for all Coastal Partners projects. No case specific factors have been identified that would increase the risk of this pressure for the Langstone FCERM scheme.
Litter	Best practice will be in place for construction site management and maintenance activities, which will minimise the risk of introducing litter to the marine environment. This will include suitable waste management and storage facilities, which is included as standard in the CEMP for all Coastal Partners projects. No case specific factors have been identified that would increase the risk of this pressure for the Langstone FCERM scheme.
Nutrient enrichment	The proposed Langstone FCERM scheme does not involve any changes to the catchment area of outfalls/discharges, or any dredging works, so no new sources/pathways of nutrient enrichment or organic
Organic enrichment	

Pressure (from NE AoO)	Justification
	enrichment are anticipated as part of the works or operation of the new defences. No case specific factors have been identified that would increase the risk of this pressure for the Langstone FCERM scheme.
Salinity decrease	The new sea defences will not result in any changes to sea water intrusion to the harbour and no changes are proposed to the catchment area of outfalls that could affect the salinity of the designated habitats on the seaward side of the defences or of the SPA/Ramsar supporting habitats on the landward side of the defences. As such, there is no potential for changes to saline and freshwater inputs to the harbour and landward supporting habitats. No case specific factors have been identified that would increase the risk of this pressure for the Langstone FCERM scheme.
Salinity increase	
Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	Foreshore sediment samples analysed from within and adjacent to the footprint of the proposed Scheme were all found to be relatively uncontaminated by heavy metals, transition elements and organotins, with the majority of analytes being below the Interim Sediment Quality Guideline (ISQG) Threshold Effect Level (TEL) and no results exceeding the Probable Effects Level (PEL) or Cefas Action Level 2 (see **Section 4.3 Marine Water and Sediment Quality of the EIA Scoping Report (Appendix B of the ES)**). The results of the Geotechnical Investigation (GI) also indicate that levels of heavy metals in all the samples tested from the landward side of the proposed works area were below limits of detection or within the thresholds for re-use of material suitable for Parks, Open Amenity Space (see **Section 4.2 Land Quality and Hydrology of the ESR (Appendix B of the ES)**). Therefore, the risk of remobilisation of heavy metal /organotin contaminated sediments from excavation of the foreshore and piling for the new sea wall is considered to be very low. All excavations during the construction works will be undertaken in accordance with the CEMP as is standard practice for all Coastal Partners projects. No case specific factors have been identified that would increase the risk of this pressure for the Langstone FCERM scheme.
Transition elements & organo-metal (e.g. TBT) contamination	

5.2.3 Screening remaining Feature-Activity-Pressure interactions

For the remaining features / supporting habitats and pressures, each Feature-Activity-Pressure (FAP) interaction was reviewed to determine if it could have a significant effect on the features of the relevant European sites. The FAP interactions were screened in or out of further assessment using information from the activity-pressure notes, the sensitivity assessment and the risk profiling contained within the AoO, together with knowledge of the project site and the proposed scheme.

FAP interactions that are listed as 'Not relevant' in the AoO were screened out of any further assessment. 'Not sensitive' interactions were also screened out if the pressure level that will result from the proposed activity within the Langstone FCERM Scheme is not likely to exceed the pressure benchmark defined within the AoO.

The screening tables completed in this stage of the assessment are included in **Annex A: Advice on Operations Screening Tables**. A summary of the screening of the remaining FAP interactions for the Solent Maritime SAC and the Chichester and Langstone Harbours SPA / Ramsar site is provided in **Table 5.4** and **Table 5.6** respectively. The pressures screened in for further assessment for each of the European sites are listed in **Table 5.5** and **Table 5.7**, together with the relevant justifications.

Table 5.4: Summary results from the screening of the remaining FAP interactions for the Solent Maritime SAC.

Y = screened in for further assessment; N = screened out of further assessment; N/A = not applicable (activity and feature cannot interact or no interaction of concern between the pressure and the feature)

Pressure	Construction Phase			Operational Phase	
	Construction of FCERM schemes	Piling	Reclaim-footprint of defences	Maintenance of hard defences	Operation of FCERM schemes
Abrasion/disturbance of the substrate on the surface of the seabed	Y	Y	Y	Y	N
Barrier to species movement	N	N	N	N	N
Changes in suspended solids (water clarity)	Y	Y	Y	Y	N
Deoxygenation	Y	N/A	Y	N/A	N
Emergence regime changes, including tidal level change considerations	N/A	N/A	N/A	N/A	N
Hydrocarbon & Polycyclic Aromatic Hydrocarbons (PAH) contamination	Y	Y	Y	Y	N
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	Y	Y	Y	Y	N
Physical change (to another seabed type)	N	N	N	N/A	N
Physical change (to another sediment type)	N	N	N	N/A	N
Physical loss (to land or freshwater habitat)	Y	Y	Y	N/A	N/A

Pressure	Construction Phase			Operational Phase	
	Construction of FCERM schemes	**Piling**	**Reclaim-footprint of defences**	**Maintenance of hard defences**	**Operation of FCERM schemes**
Physical loss due to coastal squeeze	N/A	N/A	N/A	N/A	Y
Smothering and siltation rate changes (Heavy)	Y	N/A	Y	N/A	N
Smothering and siltation rate changes (Light)	Y	Y	Y	Y	N
Underwater noise changes	N	N	N	N	N
Vibration	N/A	N	N/A	N	N/A
Visual disturbance	N	N	N	N	N
Water flow (tidal current) changes, including sediment transport considerations	N	N	N	N/A	N
Wave exposure changes	N	N	N	N/A	N

Table 5.5: Pressures that are likely to arise from activities within the Langstone FCERM Scheme that have the potential to affect the Solent Maritime SAC and have therefore been screened in for appropriate assessment.

Pressure (from Natural England AoO)	Feature(s) and/or supporting habitats that could be affected	Rationale for screening into appropriate assessment
Abrasion/disturbance of the substrate on the surface of the seabed Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	• Annual vegetation of drift lines • Perennial vegetation of stony banks • Salicornia and other annuals colonising mud and sand • Atlantic salt meadows • Spartina swards • Estuaries • Mudflats and sandflats not covered by seawater at low tide • Intertidal mixed sediments • Intertidal mud • Intertidal sand and muddy sand	Direct disturbance of vegetated shingle, intertidal sediments and saltmarsh habitats within the SAC may occur during the construction of the new sea defences due to excavation of the foreshore and use of machinery on the foreshore during the works. These pressures may also occur during maintenance activities if excavation or machinery is required on the foreshore to undertake any repairs. No works are proposed within subtidal habitats or within the sensitive seagrass beds in the harbours, therefore these habitats have been screened out of further assessment. Intertidal coarse sediments are not sensitive to these pressures and have therefore also been screened out of further assessment.
Changes in suspended solids (water clarity)	• Annual vegetation of drift lines • Perennial vegetation of stony banks • Salicornia and other annuals colonising mud and sand • Atlantic salt meadows • Spartina swards • Estuaries • Mudflats and sandflats not covered by seawater at low tide, and all associated sub-features (except intertidal coarse sediment, which is not sensitive to this pressure) • Sandbanks which are slightly covered by sea water all the time, and all associated sub-features	Excavation and disturbance of the foreshore will occur during the construction of the new sea defences, which has the potential to result in increased suspended sediment concentrations within the water column that could affect SAC habitats. This pressure may also occur during maintenance works if excavation or machinery is required on the foreshore to undertake any repairs.
Deoxygenation	• Estuaries • Mudflats and sandflats not covered by seawater at low tide	The construction of the new sea defences has the potential to cause localised increases in suspended sediment concentrations. The source of the disturbance will be short-lived and increases in suspended sediment concentrations from

Pressure (from Natural England AoO)	Feature(s) and/or supporting habitats that could be affected	Rationale for screening into appropriate assessment
	• Intertidal mixed sediments • Intertidal sand and muddy sand • Sandbanks which are slightly covered by sea water all the time • Subtidal coarse sediment • Subtidal mixed sediments • Subtidal sand	construction activities are not likely to cause significant deoxygenation effects. However, some intertidal and subtidal sediment biotopes are sensitive to deoxygenation. This pressure has therefore been screened in on a precautionary basis. SAC saltmarsh features are not sensitive to this pressure and have therefore been screened out of further assessment for this pressure. The proposed Scheme does not involve changes to the catchment area of outfalls/discharges, or any dredging works, so no new sources/pathways of nutrient enrichment or organic enrichment are anticipated as part of the works.
Hydrocarbon & Polycyclic Aromatic Hydrocarbons (PAH) contamination	• Annual vegetation of drift lines • Perennial vegetation of stony banks • Salicornia and other annuals colonising mud and sand • Atlantic salt meadows • Spartina swards • Estuaries • Mudflats and sandflats not covered by seawater at low tide, and all associated sub-features • Sandbanks which are slightly covered by sea water all the time, and all associated sub-features	Best practice will be in place for construction site management and maintenance activities, which will minimise the risk of any spills from equipment or re-fuelling activities. Spill kits will be kept on site for use in case of any accidental spillage. This is included as standard in the CEMP for all Coastal Partners projects. However, as described in **Section 4.2 (Land Quality and Hydrology) and Section 4.3 (Marine Water and Sediment Quality) of the ESR (Appendix B of the ES)**, several foreshore sediment samples analysed from within and adjacent to the proposed works area during the Ground Investigation (GI) had slightly elevated levels of PAHs above Cefas Action Level 1 but below ISQG Probable Effects Level (PEL). In addition, one landward (terrestrial) sample located in Frontage 2 had elevated levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding the ISQG PEL and LQM/CIEH Suitable 4 Use Level threshold for re-use of material suitable for Public Open Spaces (Parks) SOM1. Therefore, this pressure has been screened in on a precautionary basis for further assessment due to the potential for hydrocarbon contamination to affect SAC habitats during construction and maintenance works if excavations are not managed carefully and undertaken in accordance with the CEMP and with a detailed methodology to prevent release of contaminated sediments and/or leachate into the marine environment.
Physical loss (to land or freshwater habitat)	• Estuaries • Mudflats and sandflats not covered by seawater at low tide and all associated sub-features	The new sea defences in Frontages 3, 4 and 5 will result in the permanent loss of a narrow ribbon of intertidal sediment SAC habitat in front of Langstone Village, which will be changed to steel piles and concrete under the footprint of the new defence structures. The intertidal seagrass beds and subtidal sediment habitats in the harbours will not be affected by this pressure as they are not within the footprint of the works.
Physical loss due to coastal squeeze	• Salicornia and other annuals colonising mud and sand • Atlantic salt meadows • Spartina swards • Estuaries	Loss of intertidal habitats due to coastal squeeze over the lifetime of the Scheme will occur from the implementation of the 'Hold the Line' policy at the Langstone frontage. This loss has been assessed at both the SMP and Strategy level and compensation via the Solent and South Downs Habitat Compensation and Restoration Programme (HCRP) has been approved by the Secretary of State (see

Pressure (from Natural England AoO)	Feature(s) and/or supporting habitats that could be affected	Rationale for screening into appropriate assessment
	• Mudflats and sandflats not covered by seawater at low tide and all associated sub-features	**Annex C**), but this pressure is included here for completeness of the current assessment.
Smothering and siltation rate changes (heavy and light)	• Annual vegetation of drift lines • Perennial vegetation of stony banks • Salicornia and other annuals colonising mud and sand • Atlantic salt meadows • Spartina swards • Estuaries • Mudflats and sandflats not covered by seawater at low tide, and all associated sub-features (except intertidal coarse sediment, which is not sensitive to this pressure) • Sandbanks which are slightly covered by sea water all the time, and all associated sub-features	Excavation and disturbance of intertidal sediments will occur during the construction of the new sea defences, which has the potential to result in increased suspended sediment concentrations and associated siltation and smothering that could affect SAC habitats. This pressure may also occur during maintenance works if excavation or machinery is required on the foreshore to undertake any repairs.

Table 5.6: Summary results from the screening of the remaining FAP interactions for the Chichester and Langstone Harbours SPA / Ramsar site.

Y = screened in for further assessment; N = screened out of further assessment; N/A = not applicable (activity and feature cannot interact or no interaction of concern between the pressure and the feature)

Pressure	Construction Phase			Operational Phase	
	Construction of FCERM schemes	Piling	Reclaim – footprint of defences	Maintenance of hard defences	Operation of FCERM schemes
Above water noise	Y	Y	Y	Y	N
Abrasion/disturbance of the substrate on the surface of the seabed	Y	Y	Y	Y	N
Barrier to species movement	Y (for non-breeding birds only)	Y (for non-breeding birds only)	Y (for non-breeding birds only)	Y (for non-breeding birds only)	N
Changes in suspended solids (water clarity)	Y	Y	Y	Y	N
Deoxygenation	Y	N/A	Y	N/A	N
Emergence regime changes, including tidal level change considerations	N/A	N/A	N/A	N/A	N
Hydrocarbon & Polycyclic Aromatic Hydrocarbons (PAH) contamination	Y	Y	Y	Y	N
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	Y	Y	Y	Y	N
Physical change (to another seabed type)	N	N	N	N/A	N
Physical change (to another sediment type)	N	N	N	N/A	N

Pressure	Construction Phase			Operational Phase	
	Construction of FCERM schemes	Piling	Reclaim – footprint of defences	Maintenance of hard defences	Operation of FCERM schemes
Physical loss (to land or freshwater habitat)	Y	Y	Y	N/A	N/A
Physical loss due to coastal squeeze	N/A	N/A	N/A	N/A	Y
Smothering and siltation rate changes (Heavy)	Y	N/A	Y	N/A	N
Smothering and siltation rate changes (Light)	Y	Y	Y	Y	N
Underwater noise changes	Y	Y	Y	Y	N
Vibration	N/A	N	N/A	N	N/A
Visual disturbance	Y	Y	Y	Y	N
Water flow (tidal current) changes, including sediment transport considerations	N	N	N	N/A	N
Wave exposure changes	N	N	N	N/A	N

Table 5.7: Pressures that are likely to arise from activities within the Langstone FCERM Scheme that have the potential to affect the Chichester and Langstone Harbours SPA/Ramsar site and have therefore been screened in for appropriate assessment.

Pressure (from Natural England AoO)	Feature(s) and/or supporting habitats that could be affected		Rationale for screening into appropriate assessment
Above water noise	• Bar-tailed godwit • Curlew • Dark-bellied brent goose • Dunlin • Grey plover • Pintail • Red-breasted merganser • Redshank • Ringed plover	• Sanderling • Shelduck • Shoveler • Teal • Turnstone • Wigeon • Waterbird assemblage • Common tern • Little tern • Sandwich tern	Noise from construction and maintenance activities, e.g., breaking out of existing structures, piling activities and from the use of heavy machinery, has the potential to cause disturbance to non-breeding SPA/Ramsar birds (present in significant numbers from October to March inclusive) and breeding terns (present between April and August inclusive). Non-breeding birds feed at low tide on the adjacent intertidal sediment in Langstone and Chichester Harbours, and roost at high tide on the upper foreshore, shingle banks and/or landward functionally linked grassland sites adjacent to the Scheme. The locations of the important high tide roosting and feeding sites adjacent to the Langstone FCERM scheme are as shown in **Figure 4.2 and Figure 4.3**. The nearest tern breeding colony is located at the Oysterbeds on Hayling Island in Langstone Harbour, which is approximately 1.3km away from the proposed Scheme frontage and breeding terns forage for small fish in the water column across the whole of Chichester and Langstone Harbours.
Abrasion/disturbance of the substrate on the surface of the seabed Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	• Saltmarsh • Intertidal sediments • Functionally linked grassland sites (Solent Bird Studies (SBS) sites)		Direct disturbance of intertidal sediment and saltmarsh supporting habitat within the SPA/Ramsar site may occur during the construction of the new sea defences due to excavation of the foreshore and use of machinery on the foreshore during the works. There will also be abrasion/disturbance effects on functionally linked landward grassland and wet woodland areas which are used by SPA/Ramsar non-breeding species in Frontage 5, namely in Solent Bird Studies (SBS) Auxiliary sites H26 (where an earth embankment is proposed as the eastern tie-in) and H120 (where a reinforced concrete flood wall is proposed to run along the footpath through the woodland) (see **Figure 4.3**). There could also be additional temporary disturbance of functionally linked landward grassland supporting habitat for non-breeding SPA/Ramsar birds if important areas are used for site compounds and access routes during the construction works. These pressures may also occur during maintenance activities if excavation or machinery is required on the foreshore and/or within the SBS Auxiliary sites to undertake any repairs. No works are proposed within subtidal habitats or within the sensitive seagrass beds in the harbours, therefore these supporting habitats have been screened out of further assessment. Intertidal coarse sediments are not sensitive to these pressures and have therefore also been screened out of further assessment.
Barrier to species movement	• Bar-tailed godwit • Curlew	• Redshank • Ringed plover • Sanderling • Shelduck	Once operational, the new coastal defence is unlikely to cause any alteration to migration flyways or local flight passes (e.g., between feeding and roosting habitat) of SPA/Ramsar birds as it will be in the same location as the existing defence and there will only be a small increase in height of the new sea wall relative to bird movements.

Pressure (from Natural England AoO)	Feature(s) and/or supporting habitats that could be affected		Rationale for screening into appropriate assessment
	• Dark-bellied brent goose • Dunlin • Grey plover • Pintail • Red-breasted merganser	• Teal • Turnstone • Wigeon • Waterbird assemblage	However, there is potential for construction and maintenance activities to cause a temporary barrier to bird movements between intertidal feeding areas and important landward feeding/roosting sites due to prolonged exposure to noise and/or visual disturbance from piling and the presence of heavy machinery and personnel. Therefore, this pressure has been screened in for the construction and maintenance activities for further assessment on SPA/Ramsar non-breeding birds, except for Shoveler which are classified as 'Not sensitive' to this pressure. Both Sandwich and common terns are classified as not sensitive to this pressure and the presence of construction activities for the sea defences will not present a barrier to foraging little terns as the works are not located between their breeding colonies (at the Oysterbeds and the RSPB islands) and their foraging habitat (the shallow coastal waters of the harbours and wider Solent). The harbour mouths (a key foraging/transiting area for terns) will remain unrestricted. The pressure benchmark for the supporting habitat sensitivity assessment is 'Permanent or temporary barrier to species movement ≥50% of water body width or a 10% change in tidal excursion'. The proposed Langstone FCERM works will not cause any changes to the tidal regime or a barrier to movement of fish or seeds/propagules within the Langstone Harbour and Chichester Harbour water bodies. Therefore, impacts on terns and supporting habitats from this pressure have been screened out of further assessment.
Changes in suspended solids (water clarity)	• Common tern • Little tern • Sandwich tern • Red-breasted merganser • Saltmarsh	• Intertidal sediments • Intertidal seagrass beds • Subtidal sediments • Water column	Excavation and disturbance of intertidal sediments will occur during the construction of the new sea defences, which has the potential to result in increased suspended sediment concentrations within the water column that could affect the foraging success of terns and diving ducks and/or the supporting habitats of SPA/Ramsar birds. This pressure may also occur during maintenance activities if excavation of the foreshore is required to undertake any repairs.
Deoxygenation	• Intertidal mixed sediments • Intertidal sand and muddy sand • Subtidal coarse sediment • Subtidal mixed sediment • Subtidal mud • Subtidal sand • Water column		The construction of the new sea defences has the potential to cause localised increases in suspended sediment concentrations. This effect will be short-lived and increases in suspended sediment concentrations from construction activities are not likely to cause significant deoxygenation effects. However, some intertidal and subtidal sediments and the water column supporting habitats are sensitive to deoxygenation. This pressure has therefore been screened in on a precautionary basis. Saltmarsh supporting habitats are not sensitive to this pressure and have therefore been screened out of further assessment for this pressure. The proposed works do not involve changes to the catchment area of outfalls/discharges, or any dredging works, so no new

Pressure (from Natural England AoO)	Feature(s) and/or supporting habitats that could be affected	Rationale for screening into appropriate assessment
		sources/pathways of nutrient enrichment or organic enrichment are anticipated as part of the works.
Hydrocarbon & Polycyclic Aromatic Hydrocarbons (PAH) contamination	• All non-breeding waterbird features • All breeding tern features • Saltmarsh • Intertidal sediments • Intertidal seagrass beds • Subtidal sediments • Water column	Best practice will be in place for construction site management and maintenance activities, which will minimise the risk of any spills from equipment or re-fueling activities. Spill kits will be kept on site for use in case of any accidental spillage. This is included as standard in the CEMP for all Coastal Partners projects. However, as described in **Section 4.2 (Land Quality and Hydrology) and Section 4.3 (Marine Water and Sediment Quality) of the ESR (Appendix B of the ES)**, several foreshore sediment samples analysed from within and adjacent to the proposed works area during the Ground Investigation (GI) had elevated levels of PAHs above Cefas Action Level 1 but below ISQG PEL. In addition, one landward (terrestrial) sample located in Frontage 2 had elevated levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding the ISQG PEL and the LQM/CIEH Suitable 4 Use Level threshold for re-use of material suitable for Public Open Spaces (Parks) SOM1. Therefore, this pressure has been screened in on a precautionary basis for further assessment due to the potential for hydrocarbon contamination to affect SPA/Ramsar features and supporting habitats during construction and maintenance works if excavations are not managed carefully and undertaken in accordance with the CEMP with a detailed methodology to prevent release of contaminated sediments and/or leachate into the marine environment.
Physical loss (to land or freshwater habitat)	• Intertidal sediments • Water column • Functionally linked grassland sites (Solent Bird Studies (SBS) sites)	The new sea defences in Frontages 3, 4 and 5 will result in the permanent loss of a narrow ribbon of intertidal sediment and water column supporting habitat in front of Langstone Village, which will be changed to steel piles and concrete under the footprint of the new defence structures. There will also be some loss of functionally linked landward grassland habitat used by SPA/Ramsar non-breeding species in Frontage 5, namely in Solent Bird Studies Auxiliary site H26 where an earth embankment is proposed as the eastern tie-in. The intertidal seagrass beds and subtidal sediment supporting habitats in the harbours will not be affected by this pressure as they are not within the footprint of the works.
Physical loss due to coastal squeeze	• Intertidal sediments • Saltmarsh	Loss of intertidal supporting habitats due to coastal squeeze over the lifetime of the Scheme will occur from the implementation of the HTL policy for the Langstone frontage. This loss has been assessed at both the SMP and Strategy level and compensation via the Solent and South Downs HCRP has been approved by the Secretary of State (see **Annex C**), but this pressure is included here for completeness of the current assessment.

Pressure (from Natural England AoO)	Feature(s) and/or supporting habitats that could be affected		Rationale for screening into appropriate assessment
Smothering and siltation rate changes (heavy and light)	• Saltmarsh • Intertidal sediments • Intertidal seagrass beds • Subtidal sediments		Excavation and disturbance of intertidal sediments will occur during the construction of the new sea defences, which has the potential to result in increased suspended sediment concentrations and associated siltation and smothering that could affect SPA/Ramsar supporting habitats. This pressure may also occur during maintenance works if excavation or machinery is required on the foreshore to undertake any repairs.
Underwater noise changes	• Common tern • Little tern • Sandwich tern • Red-breasted merganser • Pintail • Dark-bellied brent goose	• Shelduck • Shoveler • Teal • Wigeon • Waterbird assemblage	Underwater noise from piling has the potential to disturb non-breeding diving ducks during the over-wintering season (October to March inclusive) and foraging terns during the summer (April to August). Underwater noise could also affect small fish prey availability in the water column, and therefore also have an indirect effect on breeding terns and diving ducks.
Visual disturbance	• Bar-tailed godwit • Curlew • Dark-bellied brent goose • Dunlin • Grey plover • Pintail • Red-breasted merganser • Redshank	• Ringed plover • Sanderling • Shelduck • Teal • Turnstone • Wigeon • Waterbird assemblage • Common tern • Little tern • Sandwich tern	The presence and movement of machinery and personnel during the construction and maintenance of the new defences has the potential to cause visual disturbance to SPA/Ramsar non-breeding birds (present in significant numbers from October to March inclusive) and breeding terns (present between April and August inclusive). Non-breeding birds feed at low tide on the adjacent intertidal sediment in Langstone and Chichester Harbours, and roost at high tide on the upper foreshore, shingle banks and/or landward functionally linked grassland sites adjacent to the Scheme. The locations of the important high tide roosting and feeding sites adjacent to the Langstone FCERM scheme as shown in **Figure 4.2 and Figure 4.3**. The nearest tern breeding colony is located at the Oysterbeds on Hayling Island in Langstone Harbour, which is 1.3km away from the proposed Scheme frontage and breeding terns forage for small fish in the water column across the whole of Chichester and Langstone Harbours. Therefore, this pressure has been screened in for the construction and maintenance activities for further assessment on all SPA/Ramsar birds (except for Shoveler which are classified as 'Not sensitive' to this pressure).

5.3 Screening Conclusion

5.3.1 Solent Maritime SAC

As indicated in **Table 5.4** and **Table 5.5**, a likely significant effect from the proposed Langstone FCERM scheme on the Solent Maritime SAC cannot be excluded at this stage as several FAP combinations have been screened in for further assessment for this site. These potential effects (pressures) can be summarised into four categories:

1. **Temporary disturbance / habitat loss** from the excavation and disturbance of the intertidal foreshore during the construction, and potentially maintenance, of the new sea defences – as indicated by the screening in of the 'abrasion/disturbance of the substrate on the surface of the seabed' and 'penetration/disturbance of the substratum below the surface of the seabed' pressures.

2. **Changes in suspended sediment (water clarity), deoxygenation and smothering and siltation rate changes (heavy and light)** caused by the excavation and disturbance of the foreshore during the construction, and potentially maintenance, of the new sea wall.

3. **Potential hydrocarbon and PAH contamination** caused by the release of potentially contaminated sediments and/or leachate into the marine environment during excavations for the construction, and potentially maintenance, of the new sea defences.

4. **Permanent loss of intertidal SAC habitat** from the footprint of the new defences and in the longer term from coastal squeeze due to sea level rise over the lifetime of the Scheme.

During the development of the EIA, avoidance and reduction measures have been included for activities where it has been identified that the proposed works could have a likely significant effect on the features of the Solent Maritime SAC (refer to **Table 17.1** in the **Conclusions chapter of the ES**). These measures have been included in the draft Construction Environmental Management Plan (CEMP) for the scheme and will also be included in the construction contractor's scope and construction methodology to ensure that they are implemented.

However, a ruling by the Court of Justice of the European Union (CJEU) in the case of *People Over Wind and Sweetman v Coillte Teoranta* (C-323/17) stated that measures intended to avoid or reduce the harmful effects of a proposed project on a European site may no longer be taken into account at the screening stage of an HRA when judging whether a proposed plan or project is likely to have a significant effect on the integrity of a European designated site. Therefore, the avoidance and reduction mitigation measures included for the Langstone FCERM Scheme have not been considered in this screening stage but instead are considered in the appropriate assessment stage in the following section (see **Section 6**).

5.3.2 Chichester and Langstone Harbours SPA and Ramsar site

As indicated in **Table 5.6** and **Table 5.7**, a likely significant effect from the proposed Langstone FCERM scheme on the Chichester and Langstone Harbours SPA and Ramsar site also cannot be excluded at this stage as several pressure-feature combinations have been screened in for further assessment for this site. These potential effects (pressures) can be summarised into eight categories, comprising of direct effects on SPA/Ramsar birds (pressures 1-4 below) and indirect effects on their supporting habitats (pressures 5-8 below), which are the same as described for the overlapping Solent Maritime SAC in **Section 5.3.1** but also including temporary loss of important functionally linked landward grassland and wet woodland sites:

1. **Above water noise** from the breaking out of existing structures, piling and the use of heavy machinery during the construction, and potentially maintenance, of the new sea defences, which could cause disturbance to SPA/Ramsar non-breeding birds and / or breeding terns depending on the timing of the works.

2. **Underwater noise** from piling has the potential to disturb non-breeding diving ducks during the over-wintering period and foraging terns during the summer and could also affect the availability of small fish prey species of water column feeding SPA/Ramsar birds.

3. **Visual disturbance** caused by the presence and movement of machinery and personnel during the works has the potential to disturb non-breeding SPA/Ramsar birds feeding at low tide on the intertidal sediment or feeding/roosting at high tide on the upper foreshore, shingle banks and/or functionally linked landward sites adjacent to the proposed Scheme.

4. **Barrier to species movement** between intertidal feeding areas and important landward feeding/roosting sites for non-breeding SPA/Ramsar birds due to prolonged exposure to noise and/or visual disturbance during construction and maintenance activities.

5. **Temporary disturbance / habitat loss** from the excavation and disturbance of the intertidal foreshore during the construction, and potentially maintenance, of the new sea defences and from the temporary disturbance of functionally linked landward grassland and wet woodland supporting habitat for non-breeding SPA/Ramsar birds during the construction of the embankment and flood wall in Frontage 5. There could also be additional temporary disturbance of functionally linked landward grassland supporting habitat for non-breeding SPA/Ramsar birds if important areas are used for site compounds and access routes during the construction works.

6. **Changes in suspended sediment (water clarity), deoxygenation and smothering and siltation rate changes (heavy and light)** caused by the excavation and disturbance of the foreshore during the construction, and potentially maintenance, of the new sea wall.

7. **Potential hydrocarbon and PAH contamination** caused by the release of potentially contaminated sediments and/or leachate into the marine environment during excavations for the construction, and potentially maintenance, of the new sea defences.

8. **Permanent loss of intertidal SPA/Ramsar supporting habitat** from the footprint of the new defences and in the longer term from coastal squeeze due to sea level rise over the lifetime of the Scheme.

As stated above (**Section 5.3.1**), avoidance and reduction measures have been identified during the development of the EIA to address potential impacts on SPA/Ramsar features and their supporting habitats, and these are considered in **Section 6**Error! Reference source not found. as part of the appropriate assessment and integrity test.

Above water noise and visual disturbance impacts on SPA/Ramsar birds have been screened out for the operational phase of the scheme as the new defences are not expected to change the number, frequency or way in which people use the Langstone frontage compared to existing levels. The new concrete sea wall in Frontage 5 will partially reduce visual disturbance to SPA/Ramsar birds using the adjacent intertidal area as people, and notably dogs using the footpath, will be screened from the harbour to a height of approximately 1 metre along the section where the concrete sea wall will be full height rather than topped with flood glass. Therefore, resulting in a small beneficial impact on the SPA/Ramsar site once the works are completed.

6. Stage 2 - Appropriate Assessment and Integrity Test

The second stage of the HRA process is to undertake an 'appropriate assessment' of the implications of the proposed scheme (alone and in combination with other plans or projects) for the screened in European sites in view of their conservation objectives. The appropriate assessment provides information to ascertain whether the proposal will have an adverse effect on the integrity of the European sites, taking account of mitigation measures (the Integrity Test).

The pressure-feature interactions that were screened in for further consideration in the Stage 1 Screening (in **Section 5**) are assessed in more detail in this section, using information on predicted impacts from the EIA and consideration of mitigation (avoidance and reduction) measures, to conclude whether each interaction, and therefore the Langstone FCERM Scheme overall, is likely to have an adverse effect on the integrity (AEOI) of the Solent Maritime SAC and/or the Chichester and Langstone Harbours SPA and Ramsar site.

In accordance with Natural England guidance, the High Level Conservation Objectives (HLCO) and the Supplementary Advice on Conservation Objectives (SACO) components of the relevant conservation advice packages have been used to link the screened in pressures to relevant ecological attributes of the SAC and SPA/Ramsar qualifying features and therefore assess the impacts of the proposed works against the conservation objectives of the site. For features and pressures where potential impacts are of a similar nature, those features and pressures have been considered together to save repetition during this assessment.

As part of pre-application discussions, there have been meetings and correspondence with Natural England during both the options appraisal / development of the leading options stage and the detailed design stage of the project to discuss the proposed works and agree suitable mitigation measures for the Langstone FCERM Scheme (see **Annex B1-B3**). Natural England officers also visited the site in April 2023 to better understand the scheme proposals. The mitigation measures agreed with Natural England have been incorporated into the proposed works and are included in the appropriate assessment below to ensure that an adverse effect on the integrity of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA/Ramsar site are avoided as far as is technically possible.

6.1 Conservation Objectives for the Solent Maritime SAC

6.1.1 High Level Conservation Objectives

The HLCOs for the Solent Maritime SAC are:

"*With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features'), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;*

- *the extent and distribution of qualifying natural habitats and habitats of qualifying species;*
- *the structure and function (including typical species) of qualifying natural habitats;*
- *the structure and function of the habitats of qualifying species;*

- *the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;*
- *the populations of qualifying species; and*
- *the distribution of qualifying species within the site.*"

6.1.2 Supplementary Advice on Conservation Objectives

The SACOs aim to describe the range of ecological attributes that are most likely to contribute to a site's overall integrity and provide more detailed information to help achieve the HLCOs set out above, including site specific targets and which attributes should be maintained and which need to be restored. The attributes that could be affected by the screened in pressures have been extracted for the screened in SAC features and sub-features and are assessed in **Table 6.1** below.

6.2 Conservation Objectives for the Chichester and Langstone Harbours SPA and Ramsar site

6.2.1 High Level Conservation Objectives

The HLCOs for the Chichester and Langstone Harbours SPA are:

"*With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change; Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;*

- *the extent and distribution of the habitats of the qualifying features*
- *the structure and function of the habitats of the qualifying features*
- *the supporting processes on which the habitats of the qualifying features rely*
- *the population of each of the qualifying features, and,*
- *the distribution of the qualifying features within the site.*"

6.2.2 Supplementary Advice on Conservation Objectives

As described above for the Solent Maritime SAC (**Section 6.1.2**), the attributes within the SACOs that could be affected by the screened in pressures have also been extracted for the Chichester and Langstone Harbours SPA/Ramsar features and are assessed in **Table 6.2** below.

6.3 Appropriate Assessment of the Langstone FCERM Scheme on the Solent Maritime SAC

Table 6.1: Appropriate assessment of screened in pressures against relevant attributes and targets for the features and sub-features of the Solent Maritime SAC

Potential effect (Pressure from NE's AoO)		Feature(s) and sub-features that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
1.	**Abrasion / disturbance of the substrate on the surface of the seabed** **Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion**	Annual vegetation of drift lines, Perennial vegetation of stony banks, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows, Spartina swards, Estuaries, Mudflats and sandflats not covered by seawater at low tide, Intertidal mixed sediments, Intertidal mud, Intertidal sand and muddy sand.	Medium for vegetated shingle and saltmarsh features. Low for the Intertidal sand and muddy sand, intertidal mud and intertidal mixed sediments biotopes (A2.243, A2.312, A2.322, A2.411) present adjacent to the Langstone FCERM Scheme.	Extent and distribution of the feature or sub-feature within the site, including associated transitional habitats. Distribution: presence and spatial distribution of biological communities.	Maintain (for mudflats and vegetated shingle) / restore (for saltmarsh and Estuaries) the total extent and spatial distribution of the estuary and its component features and sub-features (and their biological communities and natural transitions) to ensure no loss of integrity, whilst allowing for natural change and succession.	The extent and distribution of the feature/sub-feature will influence the component communities present. Maintaining/restoring this attribute will help to ensure the health and resilience of the features. A reduction in extent would alter the biological and physical functioning of the features. Changes to the spatial distribution of communities across the feature could highlight changes to the overall feature.	Yes – as described in **Section 8.6.1 of the ES (Marine Ecology)**, approximately 0.6 ha within Frontages 3, 4 and 5 consisting of 0.4ha of coastal shingle (B2) and littoral coarse sediment (A2.1) habitat types within the upper shore and 0.17ha of fragments of *Spartina anglica* saltmarsh communities within intertidal mudflat (A2.3) habitat within the SAC have the potential to be temporarily disturbed during the construction works due to excavation of the foreshore to construct the new seawall apron and from the use of machinery on the foreshore. There will also be a period following completion of the construction works that the habitat will take to recover before the intertidal sediment and saltmarsh communities return to their pre-works condition.	Yes – The vegetated shingle habitat within Frontage 2 will be avoided and will not be impacted during construction works as the new sheet pile wall will be installed working from the landward side. Intertidal works will be undertaken from the landward side wherever possible to minimise disturbance of the foreshore. Where foreshore working is required, this will be restricted to a maximum of 20 metres seawards of the existing defences. The seaward limit of the intertidal works area will be marked by the silt curtain to limit the extent of foreshore disturbance. The silt curtain and temporary working area boundary will be set out to ensure that areas of *Spartina* swards are protected and excluded from the haul route / working areas wherever possible, to ensure this habitat is not damaged during the works. Any *Spartina* swards that cannot be avoided will be translocated within the redline boundary area (see Section 4.11.15 of the Construction Environmental Management Plan for details of the translocation methods). Where access is required on the foreshore, removable temporary haul routes will be installed - this will be a geotextile and geogrid with beach material /aggregate on top, retaining the intertidal layers with additional geotextile if necessary. to minimise disturbance to the	No – the incorporated mitigation measures will ensure that temporary intertidal habitat disturbance is minimised as far as possible and the SAC habitat will be reinstated on completion of the works and therefore will not have an adverse effect on the integrity of the site.
				Structure: species composition of component communities. Structure and function: presence and abundance of key structural and influential species	Restore the species composition of component communities to Good Status (under the WFD). [Maintain OR Recover OR Restore] the abundance of listed species, to enable each of them to be a viable component of the habitat.	Species composition of communities includes consideration of both the overall range of species present, as well as their relative abundance. Within each component community, species composition and population structure should be taken into consideration to avoid diminishing biodiversity and affecting ecosystem functioning within the habitat. Benthic invertebrate communities are a good indicator of the health of the feature.			
				Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its sub-features).	The substrate types and their distribution are instrumental in determining the biological communities present within the estuary and therefore the biodiversity of these features and sub-features.			
				Structure: topography	Maintain the presence of topographic features, while allowing for natural responses to hydrodynamic regime, by preventing erosion	Topography is an essential structural component of these features. Alterations in topography can cause changes in the slope angle of the foreshore or result in increases or decreases in			

Potential effect (Pressure from NE's AoO)	Feature(s) and sub-features that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
				or deposition through human-induced activity.	surface elevation. Topographic changes can alter the way the sediment drains and holds water, and can also alter the tidal exposure, meaning areas can be covered by the tide for longer or shorter periods. This can influence the animal and plant communities supported.		intertidal habitat. Methods are set out within Section 4.15 and Appendix A of the CEMP. These measures will lead to a reduced or negligible impact on foreshore stability and accelerated recovery upon reinstatement. The area excavated for construction of the buried apron of the new sea walls will be reinstated to existing foreshore levels using material retained from the excavation and stockpiled adjacent to the working area within the silt curtain, which will be replaced back over the new apron once it has been constructed. The foreshore material will be placed back over the new sea wall apron in the reverse order to that in which it was excavated to ensure that the sediment layers are returned in the order they were prior to the works (see Sections 4.3, 4.15 and Appendix A of the CEMP)	
	Atlantic salt meadows	Medium	Structure and function: presence of unvegetated surfaces	Maintain the degree of patterning of patches of bare mud of varying sizes in a mosaic with saltmarsh vegetation.	Patches of bare mud are important to provide the structural diversity that can be important for species typical of this habitat feature.			
	Estuaries	Medium for saltmarsh Low for the Intertidal sand and muddy sand, intertidal mud, intertidal mixed sediments biotopes (A2.243, A2.312, A2.322, A2.411) present in Chichester and Langstone Harbours.	Structure: habitat zonation	Maintain the estuary zonation, which is affected by both changes in salinity gradient and tides in the estuary from river to sea (horizontally) and with shore height (vertically) from terrestrial to subtidal.	Retaining natural transitions from river to sea and upper to lower shore are important to a healthy estuary structure. Habitat zonation will be representative of the limits and range of estuarine communities with tidal movements and salinity.			
			Structure: morphology	Maintain the characteristic morphology of the estuaries within the SAC. Maintain the characteristic physical form (e.g. coastal plain or bar built), topographic features of the estuary and the overall topography on which the morphology relies.	Morphology describes the behaviour of an estuarine system, and the interaction of the topography, sediments and physical processes, e.g. wave and tides. Morphology is an essential structural component of an estuary and dictates the distribution and composition of its substrate, and therefore its habitats and species.	No - the alignment, footprint and profile of the new sea wall does not represent a significant change compared to the existing defences and there will be no change to the morphology of the estuary or the hydrodynamics and sediment transport pathways within the harbours.	None required.	No – there will not be any significant changes to the estuary morphology, hydrodynamics or sediment transport pathways within Chichester Harbour or Langstone Harbour.
	Salicornia and other annuals colonising mud and sand; Atlantic salt meadows; Spartina swards; Estuaries;	Medium for saltmarsh Low for the Intertidal sand and muddy sand, intertidal	Supporting processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the feature (or its	Various different contaminants are known to affect the species that live in, or on the surface of, sediments. These include heavy metals (Hg, As, Zn, Ni, Ch, Cd, etc), poly-aromatic	Yes – as described in the Environmental Scoping Report (**Appendix B of the ES**), foreshore sediment samples analysed from within the proposed scheme area were found to be relatively uncontaminated by heavy metals/metalloids with the	Yes - the mitigation measures incorporated to address possible effects from suspended sediments (potential effect row #2 below), i.e., undertaking foreshore works in the dry	No – the risk of excavation and remobilisation of contaminated sediments on the foreshore during the construction of the

Potential effect (Pressure from NE's AoO)		Feature(s) and sub-features that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
		Mudflats and sandflats not covered by seawater at low tide; Intertidal mixed sediments; Intertidal mud; Intertidal sand and muddy sand	mud, intertidal mixed sediments biotopes (A2.243, A2.312, A2.322, A2.411) present in Chichester and Langstone Harbours.		sub-features), i.e. to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold.	hydrocarbons (PAHs), poly-chlorinated biphenyls (PCBs), organotins (TBT) and pesticides such as hexachlorobenzene. These can impact species sensitive to particular contaminants, degrading the community structure (e.g. heavy metals) and bioaccumulating within organisms, entering the marine food chain (e.g. PCBs).	majority of samples being below the Interim Sediment Quality Guideline (ISQG) Threshold Effect Level (TEL) and no results exceeded the Probable Effects Level (PEL). All foreshore sediment samples were below Cefas Action Level 1 (AL1) for heavy metals/ metalloids except for one sample (TP8 located at the end of the High Street), which had a slightly elevated level of lead (above Cefas AL1 but below ISQG PEL and below AL2) (Coastal Partners, 2020).	and the use of a silt curtain during the works, will also prevent any contaminants in sediments from reaching the wider harbour in the event that they are present and are remobilised during the works. All excavations during the construction works will be undertaken in accordance with the CEMP as is standard practice for all Coastal Partners' projects.	new sea wall is very low and will be managed as set out in the CEMP. Therefore, the proposed works will not have an adverse effect on this attribute of the SAC.
				Supporting processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the Water Framework Directive, avoiding deterioration from existing levels.	Contaminants may impact the ecology of the SAC by having a range of biological effects on different species within the habitat, depending on the nature of the contaminant.	However, eight samples had a low level of PAH contamination (exceeding TEL / AL1 but below PEL). One sample (TP8 located at the end of the High Street) had a level of Dibenzo[a,h]anthracene that exceeded PEL. However, this is a 'less than' result so the concentration of the analyte could be below the PEL, but the accuracy of the lab analysis means it is not possible to determine this. In addition, adjacent samples to TP8 do not replicate this exceedance. All other foreshore samples had PAH levels below PEL (Coastal Partners, 2020). Therefore, the risk of remobilisation of contaminated sediments from excavation of the foreshore and piling for the new sea defences at Langstone is considered to be low, but there is a small potential for hydrocarbon contamination to affect SAC habitats during construction and maintenance works if excavations are not managed carefully and undertaken in accordance with a materials management plan and CEMP with a detailed methodology to prevent release of any potentially contaminated sediments and/or leachate into the marine environment.		
2.	**Changes in suspended solids (water clarity)** **Deoxygenation** **Smothering and siltation rate changes**	Annual vegetation of drift lines; Perennial vegetation of stony banks; Salicornia and other annuals colonising mud and sand; Atlantic	High for saltmarsh features and seagrass beds Low for the vegetated shingle	Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Prolonged changes in turbidity may influence the amount of light reaching the seabed, affecting the primary production and nutrient levels of the habitat's associated communities. Changes in turbidity may also have a range of biological effects on	Yes – excavation and disturbance of intertidal sediments will occur during the construction of the new sea defences, which has the potential to result in increased suspended sediment concentrations and associated deoxygenation and	Yes - works will be undertaken from the landward side wherever possible to minimise disturbance of the foreshore. Excavation and piling on the foreshore will only be undertaken over the low tide	No – the silt curtain will ensure that there is no adverse effect on water quality within the harbour. There is a high degree of confidence in the effectiveness of this mitigation

Potential effect (Pressure from NE's AoO)	Feature(s) and sub-features that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
(heavy and light)	salt meadows; Spartina swards; Estuaries; Mudflats and sandflats not covered by seawater at low tide and all associated sub-features (except intertidal coarse sediment, which is not sensitive to this pressure); Sandbanks which are slightly covered by seawater all the time and all associated sub-features	features, intertidal sediments and subtidal sediments			different species within the habitat, e.g. affecting their abilities to feed or breathe.	siltation/smothering of habitats within the harbours. Reduced photosynthetic / feeding rates causes reduced growth rates, which, if prolonged, may lead to a reduction in the extent of habitats and/or their component communities and a change to their distribution within the site. Saltmarsh and seagrass beds are particularly sensitive to increases in suspended sediments and siltation due to the associated reduction in light levels and smothering, which affects the ability of plants to photosynthesize.	period (when the foreshore is exposed) to minimise mobilisation of sediments into the water column. A silt curtain will be installed prior to the commencement of any work on the intertidal area to fully contain the current working area and to protect the sensitive habitats in the harbour, including the sensitive seagrass beds. The silt curtain will be maintained for the duration of construction works on the foreshore, and any failures in the silt curtain will be reported to the sub-contractor and repaired as soon as feasible.	measure due to its previous use within Langstone Harbour for the North Portsea Island scheme.
			Supporting processes: water quality - dissolved oxygen	Maintain the dissolved oxygen [DO] concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	DO levels affect the condition and health of features. High turbidity can lead to a drop in DO, especially in warmer months. Low DO can have sub-lethal and lethal impacts on fish and infauna and epifauna communities.			
			Extent and distribution of the feature or sub-feature within the site, including associated transitional habitats. Distribution: presence and spatial distribution of biological communities.	Maintain (for mudflats and vegetated shingle) / restore (for saltmarsh) the total extent and spatial distribution of the estuary and its component features and sub-features (and their biological communities and natural transitions) to ensure no loss of integrity, whilst allowing for natural change and succession.	The extent and distribution of the feature/sub-feature will influence the component communities present. A reduction in extent would alter the biological and physical functioning of the features. Changes to the spatial distribution of communities across the feature could highlight changes to the overall feature.			
			Structure: species composition of component communities Structure and function: presence and abundance of key structural and influential species	Restore the species composition of component communities to Good Status (under the WFD). [Maintain OR Recover OR Restore] the abundance of listed species, to enable each of them to be a viable component of the habitat.	Within each component community, species composition and population structure should be taken into consideration to avoid diminishing biodiversity and affecting ecosystem functioning within the habitat. Benthic invertebrate communities are a good indicator of the health of the feature.			
			Structure: sediment composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its sub-features).	The substrate types and their distribution are instrumental in determining the biological communities present within the estuary and therefore the biodiversity of these features and sub-features.			

Potential effect (Pressure from NE's AoO)		Feature(s) and sub-features that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
		Intertidal seagrass beds	High	Supporting processes: light levels	Maintain the natural light availability to the seagrass bed.	Light availability is important as photosynthesis is essential to seagrasses. If light availability, and therefore carbon uptake, is reduced lower depth limits are likely to be shallower and the extent limits of the seagrass beds reduced.			
				Supporting processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Sedimentation can influence community composition, alter species growth rates and potentially impact reproductive success by affecting larval recruitment. A change in suspended sediment character can cause a direct loss of seagrass; it's also likely to change the bed shape and the communities it supports.			
3.	**Hydrocarbon & Polycyclic Aromatic Hydrocarbons (PAH) contamination**	Annual vegetation of drift lines; Perennial vegetation of stony banks; Salicornia and other annuals colonising mud and sand; Atlantic salt meadows; Spartina swards; Estuaries; Mudflats and sandflats not covered by seawater at low tide, and all associated sub-features; Sandbanks which are slightly covered by sea water all the time, and all associated sub-features.	Medium for seagrass beds Low for intertidal mud and intertidal sand and muddy sand biotopes (A2.312, A2.322 and A2.243) Not assessed for other features & sub-features.	Supporting processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the feature (or its sub-features), i.e. to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold.	Various different contaminants are known to affect the species that live in, or on the surface of, sediments. These include heavy metals (Hg, As, Zn, Ni, Ch, Cd, etc), poly-aromatic hydrocarbons (PAHs), poly-chlorinated biphenyls (PCBs), organotins (TBT) and pesticides such as hexachlorobenzene. These can impact species sensitive to particular contaminants, degrading the community structure (e.g. heavy metals) and bioaccumulating within organisms, entering the marine food chain (e.g. PCBs).	Yes - best practice measures will be in place for construction site management and maintenance activities, which will minimise the risk of any spills from equipment or re-fuelling activities. Spill kits will be kept on site for use in case of any accidental spillage. This is included as standard in the CEMP for all Coastal Partners projects. However, as described in **Section 4.3 (Marine Water and Sediment Quality) of the ESR (Appendix B of the ES)**, several foreshore sediment samples analysed from within and adjacent to the proposed works area during the Ground Investigation (GI) had slightly elevated levels of PAHs above Cefas Action Level 1 but below ISQG Probable Effects Level (PEL). One sample (TP8 located at the end of the High Street) had a level of Dibenzo[a,h]anthracene that exceeded PEL. However, this is a 'less than' result so the concentration of the analyte could be below the PEL, but the accuracy of the lab analysis means it is not possible to determine this. In addition, as described in **Section 4.2 (Land Quality and Hydrology) of the ESR (Appendix B of the ES),** one	Yes – all excavations during the construction works will be undertaken in accordance with the CEMP. The following measures will be included within the CEMP: All materials used in the Scheme will be suitable for use in the marine environment. A contaminated land method statement and materials management plan will be produced for approval by HBC prior to the commencement of construction works. Works on the foreshore will be undertaken over the low tide period to minimise resuspension of any contaminants into the water column. A silt curtain will be in place during construction works on the foreshore, which will contain any suspended sediments within the works area and prevent any	No – the risk of Hydrocarbon and PAH contamination is low and will be managed as set out in the CEMP. Therefore, the proposed works will not have an adverse effect on this attribute of the SAC.
				Supporting processes: water quality - contaminants (habitat) Supporting processes: water quality (habitat)	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the Water Framework Directive, avoiding deterioration from existing levels. Restore (for vegetated shingle and saltmarsh	Contaminants may impact the ecology of the SAC by having a range of biological effects on different species within the habitat, depending on the nature of the contaminant. A restore target has been chosen due to nutrient levels			

Potential effect (Pressure from NE's AoO)	Feature(s) and sub-features that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
				features) where the feature is dependent on estuarine water, ensure water quality and quantity is restored to a standard that provides the necessary conditions to support the feature.	in the site. Water quality should be restored to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication do not affect the integrity of the site and features.	landward (terrestrial) sample located in Frontage 2 had elevated levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding the LQM/CIEH Suitable 4 Use Level threshold for re-use of material suitable for Public Open Spaces (Parks) SOM1. Therefore, the risk of remobilisation of contaminated sediments from excavation of the foreshore and piling for the new sea defences at Langstone is considered to be low, but there is a small potential for hydrocarbon contamination to affect SAC habitats during construction and maintenance works if excavations are not managed carefully and undertaken in accordance with the CEMP with a detailed methodology to prevent release of any potentially contaminated sediments and/or leachate into the marine environment.	significant impacts on water quality in the harbours. Machinery used during construction will be required to adhere to standard best practice measures including pollution control strategies and spillage response.	
			Structure: species composition of component communities	Restore the species composition of component communities. Restore the faunal quality of this feature to Good Status (a minimum mean IQI score of ≥ 0.64), with no sustained deterioration within the status.	Species composition of communities includes a consideration of both the overall range of species present within the community, as well as their relative abundance. Species considered need not be restricted to sessile benthic species but could include mobile species associated with the benthos.			
			Structure and function: presence and abundance of key structural, influential and distinctive species	Maintain the abundance of the vegetated shingle / saltmarsh species listed to enable each of them to be a viable component of the Annex I habitat feature. [Maintain OR Recover OR Restore] the abundance of listed species, to enable each of them to be a viable component of the habitat.	Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. Within each component community, species composition and population structure should be taken into consideration to avoid diminishing biodiversity and affecting ecosystem functioning within the habitat. Benthic invertebrate communities are a good indicator of the health of the feature.			
			Structure and function: vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the relevant National Vegetation Classification type. Maintain the species composition of	Vegetated shingle and saltmarsh habitat features will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-			

Potential effect (Pressure from NE's AoO)		Feature(s) and sub-features that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
					component vegetation communities and associated transitions, allowing for successional changes in response to natural processes.	status and drainage) and vegetation management.			
4.	**Physical loss (to land or freshwater habitat);** **Physical loss due to coastal squeeze**	Salicornia and other annuals colonising mud and sand; Atlantic salt meadows; Spartina swards; Estuaries; Mudflats and sandflats not covered by seawater at low tide; Intertidal coarse sediment; Intertidal mixed sediments; Intertidal mud; Intertidal sand and muddy sand	High	Extent and distribution of the feature, including associated transitional habitats, within the site; Distribution: presence and spatial distribution of biological communities	Maintain the total extent and spatial distribution of the intertidal mudflats and sandflats feature and its component sub-features (intertidal coarse sediment, intertidal mixed sediments, intertidal mud and intertidal sand and muddy sand habitats) and their biological communities. Restore the total extent of saltmarsh features within the SAC to at least 1,095 hectares. Restore the range of the habitat and natural transitions with other saltmarsh types and to other habitats seaward and landward. Restore the total extent and spatial distribution of the estuary to ensure no loss of integrity, whilst allowing for natural change and succession.	A reduction in extent would alter the biological and physical functioning of the feature. The distribution will influence the component communities present and help increase the health and resilience of the feature. Changes to the spatial distribution of communities across the feature could highlight changes to the overall feature. A contraction in the geographic spread of the saltmarsh features (and their component vegetation and typical species) across the site will reduce its overall area, the local diversity and variations in its structure and composition and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of the habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations that are more vulnerable to extinction.	Yes – as described in **Section 8.7.2 of the ES (Marine Ecology)**, a narrow ribbon of intertidal sediment habitat under the footprint of the new structures along Frontages 3, 4 and 5 will result in the permanent loss of 172m^2 of intertidal sediment habitat within the SAC. This comprises of coastal shingle (B2) and littoral coarse sediment (A2.1) habitat types within the upper shore. Loss of intertidal sediment and saltmarsh habitat will also occur from the implementation of the Hold the Line policy along the Langstone frontage due to sea level rise and coastal squeeze over the lifetime of the scheme. This loss has already been assessed at both the SMP and Strategy level and is being compensated via the Solent and South Downs HCRP but has been included here for completeness.	No. The area of permanent habitat loss that will arise from the proposed Scheme has been minimised as far as technically feasible, as described in **Chapter 4 (Alternatives)** and the **Detailed Design Report (AECOM, 2024a)**. The proposed design for the new sea walls in Frontages 3, 4 and 5, with a buried apron, has significantly reduced the area of permanent habitat loss as far as is technically feasible. Opportunities for intertidal habitat creation and/or improvement to offset the footprint losses have been considered as part of the detailed design work but are extremely limited within the proposed Scheme area given the very linear and narrow nature of the Scheme and the Conservation Areas / Listed Building heritage requirements and constraints on cladding and finishes. Therefore, the 172m^2 permanent loss of intertidal sediment within the SAC under the footprint of the new defences, together with the coastal squeeze losses from implementation of the HTL policy, will result in an adverse effect on the SAC intertidal habitat features and their sub-features, which cannot be mitigated under the Habitat Regulations in accordance with the Briels and Orleans CJEU rulings (C	Yes – the permanent loss of SAC intertidal sediment habitat under the footprint of the new defences, and intertidal habitat loss from coastal squeeze, will result in an adverse effect on the integrity of the mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows, Spartina swards and Estuaries features of the SAC.
		Salicornia and other annuals colonising mud and sand; Atlantic	High	Future extent of habitat within the site and ability to respond to	Maintain the ability for colonisation each year of the annual species that comprise the habitat.	This target is included to recognise the need to allow for natural fluctuations in the extent and the distribution of this habitat feature, often			

Potential effect (Pressure from NE's AoO)	Feature(s) and sub-features that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
	salt meadows; Spartina swards		seasonal changes		during particular seasons and usually as a result of natural coastal processes. Colonisation of annual species must be possible: this will reflect elevation of the marsh surface and degree of tidal exposure.		– 521/12, C – 387/15 and C – 388/15). Therefore, habitat creation to offset this permanent loss via the HCRP cannot be taken into account at the appropriate assessment stage but should instead be considered as a compensatory measure later in the HRA process, i.e. after consideration of alternative solutions and only having established imperative reasons of over-riding public interest.	
			Structure and function: vegetation structure - zonation of saltmarsh	Maintain the full range of zonations (low-mid, mid, mid-upper and transitional zones) between component saltmarsh communities and adjacent intertidal communities.	The coastal saltmarsh ecosystem has a characteristic range of natural features, representing different stages of natural succession. The full representation of these stages should be maintained or, where appropriate, restored.			
			Supporting processes: adaptation and resilience	Maintain the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.	This attribute recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes such as changes in sea levels, precipitation and temperature, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. Any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability.			

6.4 Appropriate Assessment of the Langstone FCERM Scheme on the Chichester and Langstone Harbours SPA and Ramsar site

Table 6.2: Appropriate assessment of screened in pressures against relevant attributes and targets for the non-breeding bird qualifying features of the Chichester and Langstone Harbours SPA / Ramsar site

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
1.	**Above water noise**	Non-breeding features: Bar-tailed godwit; Curlew; Dark-bellied brent goose; Dunlin; Grey plover; Pintail; Red-breasted merganser; Redshank; Ringed plover; Sanderling; Shelduck; Shoveler; Teal; Turnstone; Wigeon; Waterbird assemblage Breeding features: Common tern; Little tern; Sandwich tern	High for all except Dark-bellied brent goose (Medium) and Pintail and Shoveler (Low)	Disturbance caused by human activity	Reduce (for non-breeding birds) or restrict (for breeding birds) the frequency, duration and / or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed	The nature, scale, timing and duration of some human activities can result in bird disturbance (defined as any human-induced activity sufficient to disrupt normal behaviours and / or distribution of birds in the absence of the activity) at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population.	Yes – noise from site clearance, construction and maintenance activities, e.g., breaking out of existing structures, piling activities and from the use of heavy machinery, has the potential to cause disturbance to SPA/Ramsar birds, which could result in a temporary loss of feeding, roosting and/or nesting habitat (through displacement of birds), a reduction in feeding time (whilst alert or moving away from the source of disturbance), as well as an increase in energy expenditure if they take flight as a result of the disturbance. This could affect the energy budgets, body condition and/or breeding success of individual birds, and potentially, if severe, could affect the viability of the populations of the SPA/Ramsar species using the site. **Section 10.4 of the ES (Ornithology)** describes the important feeding, roosting and nesting locations for SPA/Ramsar birds near to the Langstone frontage. Non-breeding SPA/Ramsar birds: As described in **Section 10.6.1 of the ES (Ornithology**), use of a wacker plate in frontage 1A is likely to generate a 69dB noise contour approximately 120m into the SPA/Ramsar site on the seaward side of the works (**Figure 10.9 in the ES**). In Frontage 2, vibro piling and use of construction machinery will likely generate a noise contour of 69dB approximately 70m into the SPA/Ramsar on the seaward side (**Figure 10.10 in the ES**). In Frontage 3, vibro piling will likely generate a noise contour of 69dB approximately 100m and percussive piling of approximately 300m into the SPA/Ramsar on the seaward side (**Figure 10.11 in the ES**). In Frontage 4, vibro piling will	Yes – to reduce above water noise impacts on non-breeding SPA/Ramsar birds, the following seasonal timing restrictions will be incorporated for sensitive bird locations and will be included in the CEMP: • In Frontage 1A, a wacker plate or compacting plant with a similar noise profile will not be used between CH120-188 during the overwintering bird period October to March inclusive. • In Frontage 2, no construction work to be undertaken during the overwintering bird period October-March inclusive. • In Frontage 3, piling work will not be undertaken during the overwintering bird period October to March inclusive. Furthermore, no construction work will be undertaken on the harbourside stretch of this frontage at the Ship Inn and Annex (CH100-152) during the overwintering bird period. • In Frontage 4, no construction work to be undertaken during the overwintering bird period October-March inclusive. • In Frontage 5, no construction work to be undertaken between CH0-95 or piling / trench sheet installation work between CH96-185 during the overwintering bird period October to March inclusive. To minimise risk of disturbance to egret and heron roost, no night working, and particularly no artificial lighting, should be used between CH112-221. For all frontages, installation of piles will be undertaken using vibro or silent piling techniques as standard. Percussive piling will only be used	No – the restricted timing of the noisy works in the sensitive areas means that there will be no significant adverse effect on non-breeding SPA / Ramsar birds. Using vibro or silent piling / soft start percussive piling and only piling in the dry will ensure no adverse effect on both non-breeding SPA / Ramsar birds and foraging SPA breeding terns.
				Non-breeding population: abundance Breeding population: abundance Assemblage of species: abundance	Maintain or restore (dependent on species) the size of the non-breeding or breeding population, whilst avoiding deterioration from its current level	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird abundance depends on the suitability of the site.			
				Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species the SPA/Ramsar site supports. Each component makes a different contribution to the diversity of the assemblage and changes to some components may be considered to affect diversity more than others. The waterbird assemblage includes all native waterbirds using the site, excluding gulls and terns.			

Potential effect (Pressure from NE's AoO)	Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
						likely generate a 69dB noise contour approximately 75m and percussive piling of approximately 320m into the SPA/Ramsar site on the seaward side of the works (**Figure 10.12 in the ES**). Other construction work noise impacts in Frontage 4 (use of plant such as excavators and the delivery of materials) will likely generate a noise contour of 69dB approximately 90-100m into the SPA/Ramsar site on the seaward side of the works. In Frontage 5, vibro piling will likely generate a 69dB noise contour approximately 75m and percussive piling of approximately 400m into the SPA/Ramsar site on the seaward side of the works (**Figure 10.13 in the ES**). The use of a wacker plate 69dB noise contour will encroach up to 140m (**Figure 10.13 in the ES**) and other construction noise impacts (e.g., plant movements) up to 60m into SPA/Ramsar site on the seaward side of the works. In Frontage 5 noise levels above 69dB will encroach into SWBGS site H126 and SBS sites H120 and H26 used as functionally linked land by non-breeding waterbirds. <u>Breeding SPA birds:</u> The 69dB noise contour for percussive piling will encroach approximately 300-400 metres into the SPA site. As the nearest tern nesting grounds at the Oysterbeds on Hayling Island in Langstone Harbour are 1.3km away from the construction works, the nesting sites will not be adversely affected by airborne noise. However, breeding terns forage for food across the whole of Langstone and Chichester Harbours and therefore piling and construction work noise impacts could have a minor adverse effect on their foraging activity. However, due to the profile of the shore adjacent to the Langstone FCERM Scheme frontage, there is only a short	when necessary to achieve the required design depth. If percussive piling is required, a soft start procedure will be implemented for a minimum of 20 minutes. Should piling cease for a period greater than 10 minutes, then the soft start procedure will be repeated once piling is recommenced (see Section 4.4 of the CEMP). In addition, for any work proposed within the over-wintering bird period, October to March inclusive, an appropriate ornithological watching brief by a suitably qualified and experienced ecologist will be undertaken to assess any impacts. Significant disturbance will be determined by expert opinion and, if required, consultation with relevant bodies, but could be reached by unacceptable daily effects or cumulatively, e.g., a pattern of effect amounting to an adverse impact. Appropriate management measures will be put in place immediately to address it. Such measures could range from the installation of acoustic barriers, implementation of timing restrictions to cessation of construction activities if other measures are not sufficient to avoid significant disturbance to the over-wintering birds. Details of this watching brief will be within the final CEMP. In the event of severe weather, defined as frozen ground conditions reported by over half of the meteorological stations in England/Wales, after 7 consecutive days (allowing for short (24-48 hours) periods of thaw) an expert review will be undertaken by the project ecologist and, if necessary, work may be restricted or halted. After 14 consecutive days of frozen ground conditions and if a statutory suspension is announced all works will cease during the suspension period. See Section 4.12.5 of the CEMP.	

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
							period around high tide when the area of influence will be covered by water, and therefore for most of the tidal frame it will not be deep enough to be suitable for foraging terns.	During the SPA seabird breeding season (April to August), piling on the foreshore will only be undertaken in the dry (when the surface of the substrate is above the current tide level) and when water column supporting habitat is therefore not available for foraging terns due to tidal conditions.	
2.	**Underwater noise changes**	<u>Non-breeding features</u>: Red-breasted merganser; Pintail; Dark-bellied brent goose; Shelduck; Shoveler; Teal; Wigeon; Waterbird assemblage <u>Breeding features</u>: Common tern; Little tern; Sandwich tern <u>Supporting habitat</u>: Water column	Low for red-breasted merganser. Insufficient evidence for other diving ducks and breeding terns High for water column supporting habitat (fish prey)	Disturbance caused by human activity	Reduce (for non-breeding birds) or restrict (for breeding birds) the frequency, duration and / or intensity of disturbance affecting roosting, nesting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed	The nature, scale, timing and duration of some human activities can result in bird disturbance (defined as any human-induced activity sufficient to disrupt normal behaviours and / or distribution of birds in the absence of the activity) at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population.	Yes – as described in **Section 10.6.1 of the ES (Ornithology)** marine piling during construction and maintenance of the new sea defences has the potential to generate underwater noise and disturb non-breeding diving ducks during the over-wintering season and foraging terns during the summer season. Underwater noise could result in fatal or sub lethal damage caused by exposure to sound energy, a temporary loss of feeding habitat (through displacement of birds), a reduction in feeding time (whilst moving away from the source of disturbance), a reduction in small fish prey availability in the water column supporting habitat, as well as an increase in energy expenditure if birds take flight as a result of the disturbance. This could affect the energy budgets, body condition and/or breeding success of individual birds, and potentially, if severe, could affect the viability of the populations of the SPA/Ramsar species using the site. However, due to the profile of the shore adjacent to the Langstone FCERM Scheme frontage, there is only a short period around high tide when the works area will be covered by water. As such, the potential for sound to propagate into the water body and generate underwater noise will be limited in duration to a very short period on each tidal cycle.	Yes – to reduce below water noise effects on diving ducks (between October and March) and foraging terns (during the summer months), installation of piles will be undertaken using vibro or silent piling techniques as standard. Percussive piling will only be used when necessary to achieve the required design depth. If percussive piling is required, a soft start procedure will be implemented for a minimum of 20 minutes. Should piling cease for a period greater than 10 minutes, then the soft start procedure will be repeated once piling is recommenced. Furthermore, piling on the foreshore will only be undertaken in the dry (when the surface of the substrate is above the current tide level) to avoid the transmission of noise / sound waves into the water column. This means that piling on the foreshore will only be undertaken when the water column supporting habitat is not available for diving ducks, foraging terns and small fish prey species due to tidal conditions. See Section 4.4 of the CEMP. In addition, for any work proposed within the over-wintering bird period, October to March inclusive, an appropriate ornithological watching brief by a suitably qualified and experienced ecologist will be undertaken to assess any impacts (as set out for the above water noise impact above).	No – using vibro or silent piling / soft start percussive piling and only piling in the dry (when the surface of the substrate is above the current tide level) will ensure no significant adverse effect on non-breeding SPA/Ramsar birds or foraging SPA breeding terns.
				Non-breeding population: abundance Breeding population: abundance Assemblage of species: abundance	Maintain or restore (dependent on species) the size of the non-breeding or breeding population, whilst avoiding deterioration from its current level.	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird abundance depends on the suitability of the site.			
				Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species the SPA/Ramsar site supports. Each component makes a different contribution to the diversity of the assemblage and changes to some components may be considered to affect diversity more than others.			
				Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. Salmon, brook	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the			

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
					lamprey, minnow, gobies, eels, stickleback, flatfish, herring, sandeel, sprat) at preferred sizes (e.g.<11cm)	overall sustainability of the population.			
3.	**Visual disturbance**	<u>Non-breeding features</u>: Bar-tailed godwit, Curlew, Dark-bellied brent goose, Dunlin, Grey plover, Pintail, Red-breasted merganser, Redshank; Ringed plover, Sanderling, Shelduck, Teal, Turnstone, Wigeon, Waterbird assemblage <u>Breeding features</u>: Common tern, Little tern, Sandwich tern	High for all except Dark-bellied brent goose, Little tern and Wigeon (Medium) and Turnstone (Low)	Disturbance caused by human activity	Reduce the frequency, duration and / or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed	The nature, scale, timing and duration of some human activities can result in bird disturbance at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population.	Yes – as described in **Section 10.6.2 of the ES (Ornithology)** the presence and movement of machinery and personnel during the construction and maintenance of the new defences particularly in Frontages 3, 4 and 5 has the potential to cause visual disturbance (in combination with noise impacts) to SPA/Ramsar non-breeding birds feeding at low tide on the adjacent intertidal sediment and/or feeding or roosting on the landward functionally linked grassland SWBGS site (H126) and SBS sites (H26, H120) adjacent to the works. This disturbance could result in a temporary loss of feeding and/or roosting habitat (through displacement of birds), a reduction in feeding time (whilst alert or moving away from the source of disturbance), as well as an increase in energy expenditure if they take flight as a result of the disturbance. This could affect the energy budgets and body condition of individual birds, and potentially, if severe, could affect the viability of the populations of the SPA/Ramsar species using the site. The nearest tern breeding colony is located at the Oysterbeds on Hayling Island in Langstone Harbour, which is approximately 1.3km away from the proposed Scheme frontage, therefore the nesting sites will not be adversely affected by visual disturbance. Foraging seabirds associated with this breeding colony do use this area, however, it is considered that the partly commensal habits of these tern species make them less likely to be susceptible to visual disturbance whilst foraging. The low	Yes – to avoid visual disturbance on overwintering birds in Frontage 4, no construction works will be undertaken during the overwintering bird period (October to March inclusive). To reduce visual disturbance on overwintering birds in Frontages 3 and 5, no construction work will be undertaken on the harbourside sections (i.e., Frontage 3 chainage 100-152 and Frontage 5 chainage 0-110) during the overwintering bird period (October to March inclusive). In addition, for all frontages, any work proposed within the over-wintering bird period, October-March inclusive, an appropriate ornithological watching brief by a suitably qualified and experienced ecologist will be undertaken to assess any impacts. Significant disturbance will be determined by expert opinion and, if required, consultation with relevant bodies, but could be reached by unacceptable daily effects or cumulatively, e.g., a pattern of effect amounting to an adverse impact. Appropriate management measures will be put in place immediately to address it. Such measures could range from the installation of screening barriers, implementation of timing restrictions to cessation of construction activities if other measures are not sufficient to avoid significant disturbance to the over-wintering birds See Appendix D of the CEMP for Ornithological Watching Briefs related to the current programme of works. Any additional activities within the overwintering period will be set out within an amended CEMP accompanied by any additional noise data, mitigation methods and	No – the restricted timing of the works in sensitive areas and the implementation of the ornithological watching brief for other areas means that there will be no adverse effect on non-breeding SPA/Ramsar birds from visual disturbance during the construction or maintenance of the new sea wall.
				Non-breeding population: abundance Breeding population: abundance Assemblage of species: abundance	Maintain or restore (dependent on species) the size of the non-breeding or breeding population, whilst avoiding deterioration from its current level.	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird abundance depends on the suitability of the site.			
				Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species the SPA/Ramsar site supports. Each component makes a different contribution to the diversity of the assemblage and changes to some components may be considered to affect diversity more than others.			

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
							sensitivity of foraging terns to visual disturbance is also referenced in the Conservation Advice AoO for the site (Natural England, 2023b). Therefore, no specific mitigation is considered necessary for this impact pathway and foraging SPA terns.	additional ornithological Watching Briefs, to be submitted for approval to the LPA in consultation with the relevant consultees, In the event of severe weather, defined as frozen ground conditions reported by over half of the meteorological stations in England/Wales, after 7 consecutive days (allowing for short (24-48 hours) periods of thaw) an expert review will be undertaken by the project ecologist and if necessary, work may be restricted or halted. After 14 consecutive days of frozen ground conditions and if a statutory suspension is announced all works will cease during the suspension period (See Section 4.12.5 of the CEMP)	
4.	**Barrier to species movement**	Non-breeding features: Bar-tailed godwit; Curlew; Dark-bellied brent goose; Dunlin; Grey plover; Pintail; Red-breasted merganser; Redshank; Ringed plover; Sanderling; Shelduck; Teal; Turnstone; Wigeon; Waterbird assemblage	Medium for all except Ringed plover (High) and Dark-bellied brent goose, Red-breasted merganser and Wigeon (Low)	Connectivity with supporting habitats	Maintain safe passage of birds moving between roosting and feeding areas	The ability of the feature to safely and successfully move to and from feeding and roosting areas is critical to adult fitness and survival. This applies within the site boundary and where birds regularly move to and from off-site habitat.	No – The benchmark for this pressure is defined as disruption to >10% of the local population of a migratory feature affected by permanent or temporary lack of continuity of parts of the commuting or migration corridor causing complete obstruction or an increase in travel distance around barriers to species movement. The maximum height of the proposed new defences is +3.8m ODN, and the new defences will be in front of existing buildings or raising existing pathways. No artificial structures that could block or significantly alter bird migration routes or local flight passes will be constructed as part of the proposed works. The local movements of SPA/Ramsar non-breeding birds between intertidal feeding areas within the site boundary and the landward functionally linked SWBGS / SBS roosting sites could be temporarily altered during construction works due to noise and visual disturbance from piling and the presence of heavy machinery and personnel, but this is not likely to exceed the 10% population benchmark for this pressure.	Yes – the mitigation measures incorporated to avoid noise and visual disturbance of non-breeding SPA/Ramsar birds will ensure that the construction works do not cause a temporary barrier to local movements of over-wintering birds between the harbour and landward functionally linked sites.	No – the restricted timing of the works in sensitive areas and using vibro or silent piling / soft start percussive piling and only piling in the dry will ensure that there will be no adverse effect on non-breeding SPA/Ramsar birds from noise and visual disturbance that may have caused a barrier to species movements during the construction or maintenance of the new flood defences.
				Non-breeding population abundance Assemblage of species: abundance	Maintain or restore (dependent on species) the size of the non-breeding population, whilst avoiding deterioration from its current level	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird abundance depends on the suitability of the site.			
				Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species the SPA / Ramsar site supports. Each component makes a different contribution to the diversity of the assemblage and changes to some components may be considered to affect diversity more than others.			
				Supporting habitat: landscape	Maintain open and unobstructed terrain around	These features favour large areas of open terrain, largely free of obstructions, in and			

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
					roosting and feeding sites.	around their roosting and feeding areas. Often there is a need to maintain an unobstructed line of sight within feeding or roosting habitat to detect approaching predators, ensure visibility of displaying behaviour and/or facilitate movement of birds between the SPA and any off-site supporting habitat.			
5a.	**Temporary loss of supporting habitat - functionally linked landward sites (SBS sites)**	<u>Supporting habitat</u>: landward grassland and wet woodland sites <u>Relevant bird features</u>: Bar-tailed godwit; Curlew; Dark-bellied brent goose; Dunlin, Grey plover; Pintail; Redshank; Red-breasted merganser, Ringed plover; Sanderling, Shelduck; Shoveler; Teal; Turnstone, Wigeon; Waterbird assemblage	Not provided in AoO as supporting habitat outside of the site boundary is not included. However, assumed medium sensitivity as the grassland and wet woodland sites are listed as Auxiliary sites in the Solent Bird Studies	Supporting habitat: extent and distribution of supporting habitat for the non-breeding season	Restore the extent and distribution of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing and feeding).	This target may apply to supporting habitat which also lies outside the site boundary. Direct or indirect impacts which may affect the extent and distribution of habitats may adversely affect the population and alter the distribution of birds. The areas of importance for waterbirds around the harbours are indicated in the Solent Wader and Brent Goose Strategy (SWBGS) and the Solent Bird Studies (SBS).	No – There will be no habitat loss within SWBGS site H126 (Mill Pond). A large part of SBS auxiliary site H26 will form the main compound and will be largely unavailable to birds for the duration of the work and a thin strip of H120 will be cleared to enable the construction of Frontage 5. However, both of these sites are not classified by the SWBGS due to limited recent records for these sites. SBS data for H26 shows a single record of a little egret in 2016, and over-wintering bird surveys in 2020-21 and 2021-22 observed no SPA/Ramsar birds using this location. H120 is an area of wet woodland that is used in the winter as a night roost by little egret and grey heron. SBS data has a 2017 record of four grey herons and over-wintering bird surveys in 2020-21 and 2021-22 observed regular use of the site with a peak of 21 little egret in September (probably associated with post breeding), with more normal winter numbers of up to 3-4 little egrets and 4-7 grey heron during the daytime. The night survey indicated a peak of 31 birds (probably little egrets but may include cattle egret and grey heron). However, the proposed vegetation to be removed to facilitate access for construction of the flood wall along the footpath in Frontage 5 will not directly affect areas that are used by roosting birds, and therefore it is not	Not required as no significant effect from temporary FLL habitat loss identified.	No - due to the low/insignificant use of the affected SBS site H26 by SPA/Ramsar birds and avoidance of habitat impacts within the functionally used area of site H120, the temporary loss of habitats within these SBS sites will be inconsequential to the populations of SPA/Ramsar features and their use of the sites and therefore will not have an adverse effect on the integrity of the Chichester and Langstone Harbours SPA/Ramsar site.
				Supporting habitat: vegetation characteristics for roosting Supporting habitat: habitat structure Supporting habitat: vegetation characteristics for feeding	Maintain a vegetation structure of key roost sites dominated by bare ground or a short sparsely-vegetated sward. Maintain the extent and distribution of predominantly short grassland swards in areas used for feeding. Maintain the availability of grasslands in close proximity (typically <50 m) to open water.	The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this feature which enables successful concealment / roosting / foraging / feeding and / or displaying. Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature.			
				Supporting habitat: food availability	Maintain the distribution, abundance and availability of key	The availability of an abundant food supply is critically important for adult fitness and survival and the			

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
					food and prey items (e.g. earthworm, leatherjacket, grassland/marsh invertebrates, *Agrostis stolonifera, Lolium perenne, Trifolium repens, Scirpus, Eleocharis palustris, Polygonum, Rumex, Carex, Potamogeton* and *Glyceria*) at preferred sizes.	overall sustainability of the population. Direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population and alter the distribution of birds. Food/prey in grassland sites includes	considered to represent a significant impact.		
				Supporting habitat: landscape	Maintain open and unobstructed terrain around roosting and feeding sites, and overall field sizes where relevant.	These features are known to favour large areas of open terrain, largely free of obstructions, in and around their roosting and feeding areas. Often there is a need to maintain an unobstructed line of sight within feeding or roosting habitat to detect approaching predators and/or facilitate movement of birds between the SPA/Ramsar site and any off-site supporting habitat.			
				Connectivity with supporting habitats	Maintain safe passage of birds moving between roosting and feeding areas.	The ability of the feature to safely and successfully move to and from feeding and roosting areas is critical to adult fitness and survival. This applies within the site boundary and where birds regularly move to and from off-site habitat.			
				Non-breeding population: abundance Assemblage of species: abundance	Maintain or restore (dependent on species) the size of the non-breeding population, whilst avoiding deterioration from its current level	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird abundance depends on the suitability of the site.			
				Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species that the SPA/Ramsar site supports.			

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
						Each component makes a different contribution to the diversity of the assemblage and changes to some components may affect diversity more than others.			
5b.	**Temporary loss / disturbance of intertidal supporting habitat:** **Abrasion / disturbance of the substrate on the surface of the seabed** **Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion**	<u>Supporting habitats</u>: Saltmarsh, Intertidal mixed sediments, Intertidal mud, Intertidal sand and muddy sand <u>Relevant bird features</u>: Bar-tailed godwit; Curlew; Dark-bellied brent goose; Dunlin; Grey plover; Pintail; Red-breasted merganser; Redshank; Ringed plover; Sanderling; Shelduck; Shoveler; Teal; Turnstone; Wigeon; Waterbird assemblage	Medium for saltmarsh Low for the Intertidal sand and muddy sand, intertidal mud and intertidal mixed sediments biotopes (A2.243, A2.312, A2.322, A2.411) present adjacent to the Langstone FCERM Scheme.	Supporting habitat: extent and distribution of supporting habitat for the non-breeding season	Restore the extent and distribution of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing and feeding)	Inappropriate management and direct or indirect impacts which may affect the extent and distribution of habitats may adversely affect the population and alter the distribution of birds.	Yes – as described in **Section 8.6.1 of the ES (Marine Ecology)** and **Section 10.6.3 of the ES (Ornithology),** 0.57 ha of foreshore within Frontages 3, 4 and 5 within the SPA/Ramsar site has the potential to be temporarily disturbed during the construction works and will, therefore, be unavailable as supporting habitat for SPA/Ramsar birds. The habitat affected is comprised of 0.4ha of coastal shingle (B2) and littoral coarse sediment (A2.1) habitat types within the upper shore and 0.17ha of fragments of *Spartina anglica* saltmarsh communities within intertidal mudflat (A2.3) habitat. Therefore, the majority of the habitat that will be temporarily affected is shingle and coarse sediment, which is not especially valuable foraging habitat for most waders. Data from the overwintering bird surveys in 2020/21 and 2021/22 indicates that of birds observed within 500m of the proposed new defences that only 4% of SPA assemblage species were observed within 25m of the proposed alignment, which constitutes 332 birds across the entire survey series and an average of 34 birds per survey (0.09% of the Chichester Harbour 5-year average assemblage). There will also be a period following completion of the construction works that the foreshore habitat will take to recover and re-establish its interest to foraging birds before the intertidal communities return to their pre-works condition. The duration of this recovery period is difficult to predict but following the completion	Yes – as much of the construction works as possible will be carried out from the landward side to minimise disturbance of the foreshore. Where foreshore working is required, this will be restricted to a maximum of 20 metres seawards of the existing defences. The seaward limit of the intertidal works area will be marked by the silt curtain to limit the extent of foreshore disturbance. The silt curtain and temporary working area boundary will be set out to ensure that areas of *Spartina* swards are protected and excluded from the haul route / working areas wherever possible, to ensure this habitat is not damaged during the works. Any *Spartina* swards that cannot be avoided will be translocated within the redline boundary area (see Section 4.11.15 of the Construction Environmental Management Plan for details of the translocation methods). Where access is required on the foreshore, removable temporary haul routes will be installed - this will be a geotextile and geogrid with beach material /aggregate on top, retaining the intertidal layers with additional geotextile if necessary, to minimise disturbance to the intertidal habitat and accelerate recovery upon reinstatement. Methods are set out within Section 4.15 and Appendix A of the CEMP. The intertidal habitat disturbed during the construction works will be reinstated over the apron of the new defences to the same topography as existing levels following completion of the new sea wall. The foreshore material will be placed back over the	No – the incorporated mitigation measures will ensure that temporary intertidal habitat disturbance is minimised as far as possible and the SPA/Ramsar supporting habitat will be reinstated on completion of the works. The short-term and very small temporary disturbance of intertidal supporting habitat available to non-breeding birds over the winter following construction, when the foreshore will still be recovering, will be inconsequential to the populations of SPA/Ramsar features and their use of the site and therefore will not have an adverse effect on the integrity of the site.
				Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items at preferred sizes	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. Direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population and alter the distribution of birds.			
				Supporting habitat: landform	Maintain a high density of channel networks within intertidal feeding areas; Maintain the width of beach sections.	The physical topography and landform of a site will strongly influence the quality and extent of supporting habitats used by SPA/Ramsar features for feeding and/or roosting as appropriate. Any changes or modifications to site topography may adversely affect the ability of the supporting habitats to support and sustain the features.			
				Non-breeding population: abundance	Maintain or restore (dependent on species) the size of the non-breeding population, whilst avoiding	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird			

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				Assemblage of species: abundance	deterioration from its current level.	abundance depends on the suitability of the site.	of Phases 1 to 4b of the NPI scheme, birds were observed feeding alongside the completed defence in the winter following the completion of the works.	apron of the new sea wall in the reverse order to that in which it was excavated to ensure that the sediment layers are returned in the order they were prior to the works. This will ensure restoration of conditions suitable for like-for-like recolonisation of intertidal habitats (see Sections 4.3, 4.15 and Appendix A of the CEMP).	
				Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species that the SPA supports. Each component makes a different contribution to the diversity of the assemblage and changes to some components may be considered to affect diversity more than others.			
6.	**Changes in suspended solids (water clarity)** **Deoxygenation** **Smothering and siltation rate changes (heavy and light)**	Bird features (direct impacts): Common tern; Little tern; Sandwich tern; Red-breasted merganser; Waterbird assemblage Supporting habitats (indirect impacts): Water column; Saltmarsh; Intertidal mixed sediments; Intertidal mud; Intertidal sand and muddy sand; Intertidal seagrass beds; Subtidal coarse sediment; Subtidal mixed sediments; Subtidal mud; Subtidal sand	High for terns; Medium for red-breasted merganser High for saltmarsh features and seagrass beds Low for intertidal and subtidal sediments	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity across the habitat.	Prolonged changes in turbidity may influence the amount of light reaching supporting habitats, affecting the primary production and nutrient levels of the habitat's associated communities. A prolonged increase in turbidity can affect fish health, clog the filtering organs of suspension feeding animals and affect sedimentation rates. This in turn can adversely affect the availability and suitability of bird breeding, rearing, feeding and roosting habitats.	Yes – excavation and disturbance of intertidal sediments will occur during the construction of the new sea defences, which has the potential to result in increased suspended sediment concentrations and associated deoxygenation and/or siltation/smothering of habitats within the harbour. There are a number of mechanisms by which an increase in suspended solids could affect SPA/Ramsar bird populations; i) smothering of foraging habitats reducing access to prey items, ii) smothering of foraging habitats resulting in reduced prey abundance, iii) increased suspended solids displacing fish from foraging areas of diving ducks and seabirds, and iv) reduced clarity of water reducing the foraging ability of diving ducks (during the over-wintering period) and terns (during the summer breeding season). Diving ducks and terns tend to be sight feeders and therefore require reasonably clear water in order to see and capture fish - decreased clarity of water could reduce foraging ability or displace birds.	Yes – works will be undertaken from the landward side wherever possible to minimise disturbance of the foreshore. Where foreshore working is required, excavation and piling on the foreshore will only be undertaken over the low tide period (when the foreshore is exposed) to minimise mobilisation of sediments into the water column. A silt curtain will be installed prior to the commencement of any work on the intertidal area to fully contain the current working area and it will be maintained throughout construction to avoid increased water turbidity of adjacent areas and sensitive habitats in the harbours. Any failures in the silt curtain will be reported to the sub-contractor and repaired as soon as feasible. Silt curtains have successfully been used on Coastal Partners' North Portsea Island Scheme and have been proven to drastically reduce the release of mobilised sediment into the wider water body (Portsmouth and Langstone Harbours).	No – the silt curtain will ensure that there is no adverse effect on water quality within the harbour. There is a high degree of confidence in the effectiveness of this mitigation measure due to its previous use within Langstone Harbour for the North Portsea Island scheme.
				Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	Dissolved Oxygen [DO] levels affect the condition and health of supporting habitats. Excessive nutrients and/or high turbidity can lead to a drop in DO, especially in warmer months. Low DO can have sub-lethal and lethal impacts on fish and infauna and epifauna communities and hence can adversely affect the availability and suitability of bird breeding, rearing, feeding and roosting habitats.			
				Supporting habitat: food availability	Maintain the distribution, abundance and availability of key	The availability of an abundant food supply is critically important for successful breeding, adult			

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
					food and prey items at preferred sizes.	fitness and survival and the overall sustainability of the population.			
				Supporting habitat: extent and distribution of supporting habitat for the breeding and non-breeding seasons	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the breeding or non-breeding / wintering period as applicable.	Direct or indirect impacts which may affect the extent and distribution of habitats may adversely affect the population and alter the distribution of birds.			
				Non-breeding population: abundance Breeding population: abundance Assemblage of species: abundance	Maintain or restore (dependent on species) the size of the non-breeding or breeding population, whilst avoiding deterioration from its current level.	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird abundance depends on the suitability of the site.			
				Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species that the SPA/Ramsar site supports.			
7.	**Hydrocarbon & Polycyclic Aromatic Hydrocarbons [PAH] contamination**	<u>Supporting habitats</u>: Saltmarsh, Water column, Intertidal sediments, Intertidal seagrass beds, Subtidal sediments <u>Relevant bird features</u>: Bar-tailed godwit, Common tern, Curlew, Dark-bellied brent goose, Dunlin, Grey plover, Little tern, Pintail, Red-breasted merganser,	Medium for intertidal seagrass beds Low for intertidal mud biotope A2.312 and subtidal sand and muddy sand biotope A2.243 Not assessed for all other supporting habitats and all bird features	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.	Contaminants may have a range of biological effects on different species within the supporting habitat, depending on the nature of the contaminant. This in turn can adversely affect the availability of bird breeding, rearing, feeding and roosting habitats, and potentially bird survival.	Yes - best practice measures will be in place for construction site management and maintenance activities, which will minimise the risk of any spills from equipment or re-fuelling activities. Spill kits will be kept on site for use in case of any accidental spillage. This is included as standard in the CEMP for all Coastal Partners projects. However, as described in **Section 4.3 (Marine Water and Sediment Quality) of the ESR (Appendix B of the ES)**, several foreshore sediment samples analysed from within and adjacent to the proposed works area during the GI had slightly elevated levels of PAHs above Cefas Action Level 1 but below ISQG Probable Effects Level (PEL). One sample (TP8 located at	Yes – all excavations during the construction works will be undertaken in accordance with the CEMP. The following measures will be included within the CEMP: • All materials used in the Scheme will be suitable for use in the marine environment. • A contaminated land method statement and materials management plan will be produced for approval by HBC prior to the commencement of construction works. • Works on the foreshore will be undertaken over the low tide period to minimise resuspension of any contaminants into the water column.	No – the risk of excavation and remobilisation of contaminated sediments on the foreshore during the construction of the new sea defences is low and will be managed as set out in the CEMP. Therefore, the proposed works are not likely to have a significant adverse effect on this attribute of the SPA/Ramsar site.
				Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items at preferred sizes	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. Direct or indirect impacts which may affect the distribution, abundance and			

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		Redshank, Ringed plover, Sanderling, Sandwich tern, Shelduck, Shoveler, Teal, Turnstone, Wigeon, Waterbird assemblage				availability of prey may adversely affect the population and alter the distribution of birds.	the end of the High Street) had a level of Dibenzo[a,h]anthracene that exceeded PEL. However, this is a 'less than' result so the concentration of the analyte could be below the PEL, but the accuracy of the lab analysis means it is not possible to determine this. In addition, as described in **Section 4.2 (Land Quality and Hydrology) of the ESR (Appendix B of the ES),** one landward (terrestrial) sample located in Frontage 2 had elevated levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding the LQM/CIEH Suitable 4 Use Level threshold for re-use of material suitable for Public Open Spaces (Parks) SOM1. The risk of remobilisation of contaminated sediments from excavation of the foreshore and piling for the new sea defences at Langstone is considered to be low, but there is a small potential for hydrocarbon contamination to affect SPA/Ramsar birds and/or their supporting habitats during construction and maintenance works if excavations are not managed carefully and undertaken in accordance with the CEMP with a detailed methodology to prevent release of any potentially contaminated sediments and/or leachate into the marine environment.	• A silt curtain will be in place during construction works on the foreshore, which will contain any suspended sediments within the works area and prevent any significant impacts on water quality in the harbours. • Machinery used during construction will be required to adhere to standard best practice measures including pollution control strategies and spillage response.	
				Non-breeding population: abundance Breeding population: abundance Assemblage of species: abundance	Maintain or restore (dependent on species) the size of the non-breeding or breeding population, whilst avoiding deterioration from its current level	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird abundance depends on the suitability of the site.			
				Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species the SPA/Ramsar site supports. Each component makes a different contribution to the diversity of the assemblage and changes to some components may be considered to affect diversity more than others. The waterbird assemblage includes all native waterbirds using the site, excluding gulls and terns.			
8.	**Permanent loss of supporting habitat – intertidal sediment / saltmarsh and functionally linked landward sites (SBS sites):** **Physical loss (to land or**	Supporting habitats: Intertidal sediments; Saltmarsh; Water column; Functionally linked landward grassland and wet woodland (SBS sites) Relevant bird features: Bar-tailed godwit; Curlew; Dark-	High	Supporting habitat: extent, distribution and availability of supporting habitat for the breeding and non-breeding season	Restore the extent and distribution of suitable habitat which supports the feature for all necessary stages of the breeding period (courtship, nesting, feeding) or non-breeding/wintering period (moulting, roosting, loafing and feeding) as applicable.	To maintain or restore the extent of supporting habitats and their range in order to maintain the population. Inappropriate management and direct or indirect impacts which may affect the extent and distribution of habitats may adversely affect the population and alter the distribution of birds.	Yes – as described in **Section 8.7.2 of the ES (Marine Ecology)**, a narrow ribbon of intertidal sediment habitat under the footprint of the new structures along Frontages 3, 4 and 5 will result in the permanent loss of 172m^2 of intertidal sediment supporting habitat within the SPA/Ramsar site. This comprises of coastal shingle (B2) and littoral coarse sediment (A2.1) habitat types within the upper shore which is well compacted due its use for vehicular access and is therefore not	No. The area of permanent habitat loss that will arise from the proposed Scheme has been minimised as far as technically feasible, as described in **Chapter 4 of the ES (Alternatives)** and the **Detailed Design Report (AECOM 2024a)**. The proposed design for the new sea walls in Frontages 3, 4 and 5, with a buried apron, has significantly reduced the area of permanent habitat loss as far as is technically feasible. Opportunities for intertidal habitat creation and/or improvement to	Yes – the permanent loss of intertidal supporting habitat within the site, under the footprint of the new defences and intertidal habitat loss from coastal squeeze, will result in an adverse effect on the integrity of the site for non-breeding SPA/Ramsar wading birds.

Potential effect (Pressure from NE's AoO)	Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
freshwater habitat) **Physical loss due to coastal squeeze**	bellied brent goose; Dunlin; Grey plover; Pintail; Red-breasted merganser; Redshank; Ringed plover; Sanderling; Shelduck; Shoveler; Teal; Turnstone; Wigeon; Waterbird assemblage; Common tern; Little tern; Sandwich tern		Supporting habitat: water area	Maintain the number of waterbodies of optimal size.	Shoveler, teal, red-breasted merganser and wigeon depend on the presence and continuity of open water habitat; often requiring water bodies of a particular size to in order to successfully feed and/or roost. Changes in water area, and associated marginal habitat, can adversely affect the suitability of supporting open water habitat.	considered significant feeding habitat for non-breeding / overwintering bird populations. As such, the area of permanent habitat loss that will result from the proposed works represents a very small footprint of effect in an intertidal habitat that is not particularly important for feeding SPA/Ramsar waterbirds. As described in **Section 10.7.1 of the ES (Ornithology)** the loss of intertidal habitat is considered inconsequential for foraging terns and diving ducks as it is sub-optimal habitat for water column feeding. Due to the profile of the shore, it is only for a short period at the top of the tide when the area that will be lost under the footprint of the defences is covered by water and therefore for most of the tidal frame it is not deep enough to be suitable for foraging terns and diving ducks. There will also be some permanent loss of landward sites used by SPA/Ramsar non-breeding species. There will be a permanent loss of 139m² (0.2% of the total area) of Solent Bird Studies Auxiliary site H26 in Frontage 5, where an earth embankment is proposed as the eastern tie-in. This site is not classified by SWBGS due to limited recent records. As described in **Section 10.7.1 of the ES (Ornithology)**, survey data indicates that this site is infrequently used by over-wintering birds and the alignment of the proposed embankment is along an existing hedgerow which will limit its impact as over-wintering birds tend to avoid areas close to perceived predator threat and therefore do not use areas close to hedgerows etc). As such, this loss is considered inconsequential to the feeding or roosting supporting habitat function for SPA/Ramsar birds and is	offset the footprint losses have been considered as part of the detailed design work but are extremely limited within the proposed Scheme area given the very linear and narrow nature of the Scheme and the Conservation Areas / Listed Building heritage requirements and constraints on cladding and finishes. Therefore, the 172m² permanent loss of intertidal sediment within the SPA/Ramsar site under the footprint of the new defences, together with the coastal squeeze losses from implementation of the HTL policy, will result in an adverse effect on the SPA/Ramsar intertidal supporting habitat, which cannot be mitigated under the Habitat Regulations in accordance with the Briels and Orleans CJEU rulings (C – 521/12, C – 387/15 and C – 388/15). Therefore, habitat creation to offset this permanent loss via the HCRP cannot be taken into account at the appropriate assessment stage but should instead be considered as a compensatory measure later in the HRA process, i.e. after consideration of alternative solutions and only having established imperative reasons of over-riding public interest.	The loss of intertidal habitat is considered inconsequential (no adverse effect) for foraging terns and diving ducks as it is sub-optimal habitat for water column foraging due to its upper intertidal nature (limited temporal availability and limited depth of inundation).
			Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items at preferred sizes.	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. Direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population and alter the distribution of birds.			
			Non-breeding population: abundance Breeding population: abundance Assemblage of species: abundance	Maintain or restore (dependent on species) the size of the non-breeding or breeding population, whilst avoiding deterioration from its current level.	This will sustain the site's population and contribute to a viable local, national and bio-geographic population. Maintaining or restoring bird abundance depends on the suitability of the site.			
			Assemblage of species: diversity	Maintain the species diversity of the bird assemblage	This ensures the waterbird assemblage reflects the diversity of species that the SPA supports. Each component makes a different contribution to the diversity of the assemblage and changes to some components may be considered to affect diversity more than others.			

Potential effect (Pressure from NE's AoO)		Feature(s) that could be affected (from screening)	Sensitivity of the feature to the pressure (from AoO)	Relevant attribute (from SACOs)	Attribute target (from SACOs)	Contribution of attribute to ecological integrity of the site (from SACOs)	Is the proposed Langstone FCERM Scheme capable of adversely affecting this attribute of the site?	Does the proposal include measures which would avoid or reduce the potential effect?	Will there be a residual adverse effect on this attribute of the site's conservation objectives?
							unlikely to generate a significant adverse effect. Loss of intertidal sediment and saltmarsh SPA/Ramsar habitat will also occur from the implementation of the Hold the Line policy along the Langstone frontage due to sea level rise and coastal squeeze over the lifetime of the scheme. This loss has already been assessed at both the SMP and Strategy level and is being compensated via the Solent and South Downs HCRP but has been included here for completeness.		

6.5 Integrity Test

In the context of the Habitats Regulations, the integrity of a site is defined as "*the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is (or will be) designated.*" (European Commission, 2019; 2021).

The information in the appropriate assessments above (**Table 6.1** and **Table 6.2**) indicates that, providing the proposed mitigation measures are secured, the construction phase of the Langstone FCERM Scheme works will not have an adverse impact on the features and their attributes of the SAC or SPA/Ramsar sites. The incorporated mitigation measures (listed below) will prevent disturbance of SPA/Ramsar birds and ensure that the water quality and habitats within the harbours are not adversely affected. However, in the operational phase, the permanent loss of intertidal habitat under the footprint of the new sea wall structures, and from coastal squeeze over the lifetime of the scheme, will result in an adverse effect on the extent and distribution attribute of the sites' conservation objectives for the Estuaries, Mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows and Spartina swards SAC features and the intertidal sediment and saltmarsh SPA/Ramsar supporting habitats.

As such, it is concluded that the Langstone FCERM Scheme will have an adverse effect alone on the integrity of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar site in view of their conservation objectives. There is, therefore, no need for an in-combination assessment as any such effects are irrelevant to the conclusion of the appropriate assessment and integrity test (Tyldesley and Chapman, 2013). Instead, the proposed project must proceed to the derogation tests under Article 6(4) of the Habitats Directive, which is the subject of the following section of this report (**Section 7: Consideration of Alternatives**, **Imperative Reasons of Over-riding Public Interest and Compensation Measures**).

Incorporated mitigation measures to be included within the CEMP for the proposed works. The final CEMP has been submitted to the LPA and the MMO for approval as a pre-commencement condition on the planning permission and marine licence:

1) A silt curtain will be installed prior to the commencement of any work on the intertidal area to fully contain the current working area. The silt curtain will be maintained for the duration of construction works on the foreshore, and any failures in the silt curtain will be reported to the sub-contractor and repaired as soon as feasible.

   Reason: To clearly delineate the working area on the foreshore and protect the sensitive habitats in the harbour from suspended sediments and smothering and ensure the conservation status of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar site.

2) Intertidal works will be undertaken from the landward side wherever possible to minimise disturbance of the foreshore. Where foreshore working is required, the intertidal works area will be restricted to a maximum of 20 metres seawards of the existing defences. The seaward limit of the intertidal works area will be marked by the silt curtain to limit the extent of foreshore disturbance. The silt curtain and temporary working area boundary will be set out to ensure that areas of *Spartina* swards are

protected and excluded from the haul route / working areas wherever possible, to ensure this habitat is not damaged during the works. Any *Spartina* swards that cannot be avoided will be translocated within the redline boundary area (see Section 4.11.15 of the Construction Environmental Management Plan for details of the translocation methods). Where access is required on the foreshore, removable temporary haul routes will be installed so that they are removable (e.g. geotextile with sheet piles laid flat or aggregate on top) to minimise disturbance to the intertidal habitat and accelerate recovery upon reinstatement.

Reason: To minimise disturbance of the intertidal habitat and ensure the conservation status of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar site.

3) The vegetated shingle habitat within Frontage 2 will be avoided and will not be impacted during construction works as the new sheet pile wall will be installed working from the landward side.

   Reason: To avoid disturbance of the sensitive vegetated shingle habitat and ensure the conservation status of the Solent Maritime SAC.

4) The intertidal habitat excavated for construction of the buried apron of the new sea walls in Frontages 3, 4 and 5 will be reinstated to the same topography as existing levels following completion of the new sea wall using material retained from the excavation and stockpiled adjacent to the working area within the silt curtain. The foreshore material will be placed back over the new sea wall apron in the reverse order to that in which it was excavated to ensure that the sediment layers are returned in the order they were prior to the works.

   Reason: To ensure restoration of conditions suitable for like-for-like re-development of intertidal habitats following completion of the works and ensure the conservation status of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar site.

5) Excavation and piling on the foreshore will only be undertaken over the low tide period (when the surface of the foreshore is above the current tide level).

   Reason: To minimise the suspension of sediments into the water column and avoid transmission of sound into the water body to ensure the conservation status of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar site.

6) All materials used in the Scheme will be suitable for use in the marine environment. Machinery used during construction will be required to adhere to standard best practice measures including pollution control strategies and spillage response.

   Reason: To minimise the risk of introducing pollution or contamination during the works and ensure the conservation status of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar site.

7) A contaminated land method statement and materials management plan will be produced for approval by HBC prior to the commencement of construction works. All

excavations during the construction works will be undertaken in accordance with the CEMP and Materials Management Plan as is standard practice for all Coastal Partners' projects.

Reason: To minimise the risk from any potentially contaminated sediments that may be excavated during the construction works and to ensure the conservation status of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar site.

8) The following seasonal timing restrictions will be incorporated for sensitive bird locations and will be included in the CEMP:
   - In Frontage 1A, a wacker plate or compacting plant with a similar noise profile will not be used between CH120-188 during the overwintering bird period October to March inclusive.
   - In Frontage 2, no construction work to be undertaken during the overwintering bird period October-March inclusive.
   - In Frontage 3, piling work will not be undertaken during the overwintering bird period October to March inclusive. Furthermore, no construction work will be undertaken on the harbourside stretch of this frontage at the Ship Inn and Annex (CH100-152) during the overwintering bird period.
   - In Frontage 4, no construction work to be undertaken during the overwintering bird period October-March inclusive.
   - In Frontage 5, no construction work to be undertaken on the harbourside stretch of this frontage (CH0-110) or piling / trench sheet installation work between CH96-185 during the overwintering bird period October to March inclusive. To minimise risk of disturbance to egret and heron roost, no night working, and particularly no artificial lighting, should be used between CH112-221.

   Reason: To avoid the effect of acoustic and visual disturbance upon over-wintering birds and ensure the conservation status of the Chichester and Langstone Harbours SPA and Ramsar site.

9) Installation of piles will be undertaken using vibro or silent piling techniques as standard. Percussive piling will only be used when necessary to achieve the required design depth. If percussive piling is required, a soft start procedure will be implemented for a minimum of 20 minutes. Should piling cease for a period greater than 10 minutes, then the soft start procedure must be repeated once piling is recommenced. Piling methods will be agreed and included as part of the final CEMP once a contractor has been appointed.

   Reason: To reduce the effect of acoustic disturbance upon SPA/Ramsar birds and their prey species and ensure the conservation status of the Chichester and Langstone Harbours SPA and Ramsar site.

10) For any work proposed within the over-wintering bird period (October to March inclusive) an appropriate ornithological watching brief by a suitably qualified and experienced ecologist will be undertaken to assess any impacts. Significant disturbance will be determined by expert opinion and, if required, consultation with relevant bodies, but could be reached by unacceptable daily effects or cumulatively, e.g., a pattern of effect amounting to an adverse impact. Appropriate management

measures will be put in place immediately to address it. Such measures could range from the installation of acoustic/screening barriers, implementation of timing restrictions to cessation of construction activities if other measures are not sufficient to avoid significant disturbance to the over-wintering birds. Ornithological Watching Briefs can be found in Appendix D of the CEMP.

Reason: To avoid the effect of acoustic and visual disturbance upon over-wintering birds and ensure the conservation status of the Chichester and Langstone Harbours SPA and Ramsar site.

11) In the event of severe weather, defined as frozen ground conditions reported by over half of the meteorological stations in England/Wales, after 7 consecutive days (allowing for short (24-48 hours) periods of thaw) an expert review will be undertaken by the project ecologist and, if necessary, work may be restricted or halted. After 14 consecutive days of frozen ground conditions and if a statutory suspension is announced all works will cease during the suspension period. See Section 4.12.5 of the CEMP.

Reason: To minimise adverse effects on over-wintering birds and ensure the conservation status of the Chichester and Langstone Harbours SPA and Ramsar site.

7. Derogation under Article 6(4) of the Habitats Directive

The Integrity Test (**Section 6.5**) concluded that the Langstone FCERM Scheme will have an adverse effect alone on the integrity of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar site in view of their conservation objectives due to the permanent loss of intertidal habitat within the European sites. Therefore, the proposal can only be permitted if it meets the conditions and requirements of Article 6(4) of the Habitats Directive.

Opportunities for intertidal habitat creation and/or improvement to offset the footprint losses have been considered as part of the detailed design work but are extremely limited within the proposed Scheme area given the very linear and narrow nature of the Scheme and the Conservation Areas / Listed Building heritage requirements and constraints. Furthermore, CJEU case law indicates that permanent habitat loss resulting from the implementation of SMP and Strategy policies via FCERM scheme delivery within a European site should be considered to have an adverse effect on the integrity of the site, and that the provision of new or improved habitat, even within the same European site, cannot mitigate for the loss or damage to the habitat for which the site is designated.

In light of the CJEU rulings, Coastal Partners has previously sought advice from Defra and Natural England on the HRA process for FCERM schemes which will result in unavoidable habitat loss in delivering approved SMP and Strategy policy (see **Annexes B4 and B5**). In summary, as the North Solent SMP and the Portchester Castle to Emsworth Strategy (PEMS) have been through the HRA process and the derogation tests, the Secretary of State has already approved the plan and the decision to have a coastal defence at this location (i.e. to Hold the Line). Another derogation is not required for the Langstone FCERM Scheme as the alternatives and IROPI tests have already been agreed at the plan and strategic level. The Secretary of State derogation approval letters for the North Solent SMP and the PEMS are included in **Annex C**.

As such, this HRA for the Langstone FCERM Scheme only needs to consider the unforeseen circumstances that have materialized since the SMP and PEMS HRAs were undertaken. These unforeseen circumstances include:

1) **The pressures generated by the construction activities** required to build the scheme to deliver the SMP and PEMS policy of HTL. This has been addressed in the appropriate assessments and integrity test in **Section 6**; and

2) **The habitat loss from encroachment of the new sea defences footprint** into the European site, which is considered further in this derogation chapter. **Section 7.1** provides the information required to demonstrate that the proposed design for the Langstone FCERM Scheme is the solution to delivering the SMP and Strategy HTL policy which best respects the integrity of the European sites. **Section 7.2** describes the compensation measures that will be delivered to address the additional unavoidable habitat loss from the footprint of the structures and ensure that the overall coherence of the European site network is protected.

7.1 Stage 3 - Consideration of Alternatives

The first obligation of the Article 6(4) derogation procedure is to demonstrate that the proposal put forward is the least damaging for habitats, for species and for the integrity of the European

site network, regardless of economic considerations, and that no other feasible alternative exists that would not adversely affect the integrity of the sites (European Commission, 2019; 2021).

This stage of the assessment therefore examines alternative ways of achieving the objectives of the proposed scheme to establish whether there are any financially, legally and technically feasible solutions that would avoid or have a lesser adverse effect on the integrity of the European sites.

7.1.1 Objectives of the proposed scheme

Before it is possible to assess whether there are any alternative solutions to the proposed scheme, it is necessary to identify the problem that the scheme is trying to solve and the objectives that led to the proposed design. **Chapter 1 (Introduction) and Chapter 2 (Statement of Need and Strategic Background) of the ES** describe the risk from coastal flooding and erosion to Langstone Village and the properties, infrastructure and assets that may be affected in the event of a failure or breach of the current defences. The following assets at Langstone are at risk from flooding based on a 0.5% AEP (1 in 200 year) tidal flood event (present day):

- 53 residential properties
- 4 non-residential properties
- Critical infrastructure including the A3023 (the only road crossing to Hayling Island)
- Heritage assets

As described in **Section 2.1 of the ES**, visual inspections and structural investigations have assessed the residual life of some of the existing flood defences at Langstone as less than five years and, therefore, without a Scheme at Langstone, the existing community will continue to be at significant flood and erosion risk.

The key aims and objectives of the Langstone FCERM Scheme are:

- To reduce the risk of flooding and erosion on residents, businesses, the local economy and the A3023 at Langstone.
- To construct new coastal defences that provide a present-day Standard of Protection (SoP) of 0.5% AEP (1:200-year event).
- To construct new coastal defences with a 50-year design life with minimal maintenance and operational requirements.
- To construct new coastal defences that are sympathetic to the heritage and landscape of the area, and achieve wider benefits such as place-making, regeneration, and improved amenity.
- To enhance and improve the environment and provide a minimum of 10% biodiversity net gain through the scheme.

7.1.2 Consideration of alternatives in setting the Hold the Line (HTL) policy option

As described in **Chapter 2 of the ES** and **Section 1.1 of this report**, the strategic policy of Hold the Line (HTL) for the Langstone FCERM Scheme was set by the North Solent SMP,

which was adopted in 2010. The Portchester Castle to Emsworth Strategy (PEMS) also confirmed that there is a strategic need to improve FCERM defences along the Langstone Village frontage, also adopting a policy of HTL. Both the North Solent SMP and the PEMS underwent a rigid option selection process, including consideration of the 'do nothing' option, to identify policy that is considered environmentally, technically and economically viable. The HRAs for the North Solent SMP and the PEMS included a thorough assessment of alternative solutions, which demonstrated that the policies adopted are the least damaging and that there are no alternative solutions that would have a lesser effect on the integrity of the European sites. This has been approved by the Secretary of State for both the SMP and the PEMS as shown in the derogation letters in **Annex C** and, therefore, alternatives to the HTL policy for the Langstone Village frontage are not considered further here.

7.1.3 Consideration of alternatives in designing the implementation of the HTL policy

FCERM option selection

Chapter 4 of the ES describes the option selection process that was followed to determine the leading options for the design of the Langstone FCERM Scheme to deliver the SMP and strategic policy of HTL. The scheme design went through a robust option development, long-list and short-list process, as described in **Sections 4.1 and 4.2 of the ES**. This resulted in the following viable (i.e. financially, legally and technically feasible) options being short-listed for the various frontages within the Langstone FCERM Scheme:

- Option 1, Do Nothing, abandon defences, no maintenance.
- Option 2, Do Minimum, reactive patch and repair for health and safety compliance.
- Option 3, Capital Refurbishment, proactive repair of structures to extend life.
- Option 4, Crest Raising / Floodwall, raising the crest of the defence to improve the SoP.
- Option 6, Seawall / revetment / sheet piling, new linear defence to improve SoP.
- Option 8, Land Raising, raising roads and or land to sustain / improve current SoP.
- Option 9, In situ deployable defences, includes flood gates and flip-up barriers.
- Option 10, Demountable Defences, temporary deployment of defences.
- Option 11, Property Level Resilience (PLR), local modifications to properties to reduce individual flood risk.

The Langstone scheme area is characterised by landward space constraints, an environmentally designated foreshore which limits the potential for encroachment, heritage / landscape constraints and substantial local variation in the orientation and character of the shoreline. It was therefore unfeasible for the scheme to comprise just one defence type across each frontage. As a result, a wide variety of defence types were considered in the option appraisal process for each location along the Core Scheme frontage.

A multi-criteria analysis was undertaken to determine the leading option for each frontage of the Scheme. As described in **Sections 4.2.2 and 4.2.3 of the ES**, this analysis included a full assessment of the technical, environmental, economic and social impacts of each short-listed option. Furthermore, several frontage wide options and alternative alignments for the scheme were considered, as described in **Section 4.2 and 4.3 of the ES**. As part of the short list appraisal, several options were ruled out as they would cause significant adverse effects to the designated site features of the harbours – for example the tidal flood barrier and offshore

breakwater options. Thorough environmental consideration was given to the remaining short-listed options for each frontage, to ensure that the leading options selected and taken forward into the design stage were the least encroaching viable options and therefore the least damaging solutions to the integrity of the European sites that meet the Scheme's objectives.

Outline and Detailed design

Throughout the design process, the project team has sought to avoid or minimise as far as is technically possible the encroachment of the new flood defence structures into the designated intertidal habitat, as described in **Sections 4.3 and 4.4 of the ES**. In particular, the design for the new flood defences in Frontage 4 and Frontage 5 within Chichester Harbour was revised during detailed design to incorporate a buried toe/apron, which significantly reduced the area of permanent intertidal habitat loss as far as is technically feasible.

The proposed defence alignments have been setback wherever possible to do so, for example at the southern end of Frontage 2. However, due to the significant landward space constraints and the heritage constraints along the scheme, it is not possible to setback defences along the harbourside stretches of Frontages 3, 4 and 5 as the existing buildings and footpath prevent this.

Opportunities for intertidal habitat creation and/or improvement to offset the footprint losses have been considered as part of the detailed design work but are extremely limited within the proposed Scheme area given the very linear and narrow nature of the Scheme and the Conservation Areas / Listed Building heritage requirements and constraints on cladding and finishes.

As such, the proposed design is the least encroaching viable option for the Langstone FCERM scheme and is the least damaging option to the integrity of the European sites that delivers the scheme objectives.

7.2 Stage 4 - Imperative Reasons of Over-Riding Public Interest (IROPI) and Compensatory Measures

In the absence of alternative solutions, or in the presence of solutions having even greater negative effects on the European sites (as is the case for the Langstone FCERM Scheme), the next stage of the derogation procedure is to assess whether the reasons for undertaking the project are imperative (for health and safety and/or socio-economic reasons) and of over-riding public interest. If IROPI can be demonstrated, and the necessary compensatory measures have been secured to ensure that the overall coherence of the European site network is maintained, then permission may be granted under Regulation 64(1) of the Conservation of Habitats and Species Regulations 2017 (as amended).

7.2.1 Imperative Reasons of Over-riding Public Interest (IROPI)

The HRAs for the North Solent SMP and the PEMS both set out the imperative and over-riding reasons of public interest for a coastal defence at Langstone Village. These reasons include:

- A need to address a serious risk to human health and public safety - uncoordinated and un-controlled flood and erosion risks to residential populations and major infrastructure (the A3023 is the only road on to Hayling Island); and

- Where failure to proceed would have unacceptable social and / or economic consequences (which would include the loss of, or risk to, residential properties, commercial properties, important infrastructure and services and assets of national and local historical and cultural heritage importance) through coastal flood and erosion damage.

The PEMS IROPI case for the Langstone frontage states: “The competent authority believes the residual damage is justified by the case for overriding public importance based on a need to address a serious risk to human health and public safety from risk of flooding to 81 homes by 2108.”

As described above, the Secretary of State has already approved the IROPI case for a coastal defence at Langstone and the derogation approval letters are provided in **Annex C**. Defra has confirmed that another derogation and Secretary of State approval is not required for individual FCERM schemes as the alternatives case and IROPI test has already been agreed at the plan and strategic level and the scheme is implementing the approved SMP / PEMS policy (see **Annex B4**). Natural England is also in agreement with this approach as indicated in their previous advice on the North Portsea Island FCERM Scheme (see **Annex B5**).

There are no habitats or species that are considered ‘priority’ features under Annex I or Annex II of the Habitats Directive that will be adversely affected by the Langstone FCERM Scheme and, therefore, there is no change to the suite of reasons that can be considered under IROPI to those considered within the North Solent SMP or the PEMS HRAs.

7.2.2 Compensatory Measures

Under Article 6(4) of the Habitats Directive and Regulation 68 of the Conservation of Habitats and Species Regulations 2017 (as amended), where a project is agreed to, notwithstanding a negative assessment of the implications for a European site, the competent authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of the European site network is protected.

In order to determine the compensatory measures required, it is necessary for the appropriate assessment and the integrity test to precisely describe the harm to the site. As stated in **Section 6.5**, the Langstone FCERM Scheme will result in an adverse effect on the extent and distribution attribute of the of the sites’ conservation objectives for the Estuaries, Mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows and Spartina swards SAC features and the intertidal sediment and saltmarsh SPA/Ramsar supporting habitats due to the permanent loss of intertidal habitat under the footprint of the new sea wall structures and from coastal squeeze over the lifetime of the scheme.

The Environment Agency’s Habitat Compensation and Restoration Programme (HCRP) has already been approved by the Secretary of State as the agreed compensatory mechanism for habitat losses caused by coastal squeeze due to the HTL policies within the North Solent SMP and the PEMS (see **Annex C**). As the Langstone FCERM Scheme is implementing the SMP and strategic policy, it follows that any unforeseen additional compensatory requirements arising at the scheme level can be included within this compensatory mechanism. This approach is supported by Defra and Natural England as indicated in their previous advice on the North Portsea Island FCERM Scheme (**Annex B4 and B5**).

A live habitat balance sheet for the Solent and South Downs (SSD) HCRP is maintained and the Environment Agency reports both locally and nationally on HCRP delivery to both Natural England and Defra. The live habitat balance sheet for the SSD HCRP is available via the Southern Coastal Group and SCOPAC website at the following link: https://southerncoastalgroup-scopac.org.uk/rhcp.

The intertidal habitat losses from the footprint of the new defence structures for the Langstone FCERM Scheme will be added to the SSD HCRP balance sheet to ensure that the required additional compensation is captured within the HCRP targets. This will include the loss of 172m^2 of intertidal sediment habitat from the footprint of the new defences in Frontages 3, 4 and 5 of the proposed scheme.

8. Conclusion

A thorough assessment of the impacts of the proposed Langstone FCERM Scheme on the relevant European sites has been undertaken and is presented in this report. The information in the appropriate assessments in **Section 6.3** and **Section 6.4** indicates that, providing the proposed mitigation measures outlined in **Section 6.5** are secured, the construction phase of the Langstone FCERM works will not have an adverse impact on the attributes of the Solent Maritime SAC or the Chichester and Langstone Harbours SPA / Ramsar site. However, in the operational phase, the permanent loss of intertidal habitat under the footprint of the new defence structures and from coastal squeeze over the lifetime of the scheme, will result in an adverse effect on the extent and distribution attribute of the sites' conservation objectives for the Estuaries, Mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows and Spartina swards SAC features and the intertidal sediment and saltmarsh SPA/Ramsar supporting habitats.

However, as the North Solent SMP and the PEMS have already been through the HRA process and the derogation tests under Article 6(4) of the Habitats Directive, the Secretary of State has already approved the plan and the decision to have a coastal defence at this location (i.e. to Hold the Line). Another derogation is not required for the Langstone FCERM Scheme as the alternatives and IROPI tests have already been agreed at the plan and strategic level. The design of the new sea defences at Langstone has been developed ensuring the that least encroaching viable option is taken forward. The HCRP has already been approved by the Secretary of State as the agreed compensatory mechanism for habitat losses caused by coastal squeeze due to the HTL policies within the North Solent SMP and the PEMS. As the Langstone FCERM Scheme is implementing the SMP and strategic policy, it follows that any unforeseen and unavoidable additional compensatory requirements arising at the scheme level can be included within this compensatory mechanism to ensure the overall ecological coherence of the European site network. This approach has been previously supported by Defra and Natural England for the North Portsea Island FCERM Scheme (**Annex B4 and B5**).

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Annex A: Advice on Operations Screening Tables

This Annex includes the screening tables for interactions between European protected site features and activities within the proposed Langstone FCERM Scheme, as derived from the Natural England AoO for each site.

A separate table has been created for each of the activities within the proposed Langstone FCERM Scheme as described in **Section 5.2** (i.e. construction of coastal flood and erosion risk management schemes, piling, reclaim and land take (e.g. the footprint of coastal defences), maintenance of hard coastal defences and operation of coastal flood and erosion risk management schemes).

Within the screening tables, the sensitivity categories are the categories within the Natural England Advice on Operations, i.e. S = sensitive; IE = insufficient evidence to assess; NA = not assessed; NS = not sensitive at the benchmark; and grey = not relevant. For more information, please refer to the legend within the Advice on Operations on the Designated Sites System (available here: https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011011&SiteName=chichester&SiteNameDisplay=Chichester+and+Langstone+Harbours+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=).

A1. Solent Maritime SAC

INSERT Solent Maritime SAC AoO screening tables when produce final PDF version

A2. Chichester and Langstone Harbours SPA and Ramsar site

INSERT Chichester and Langstone Harbours SPA AoO screening tables when produce final PDF version

Annex B: Natural England and Defra advice

This Annex includes pre-application advice received from Natural England during the option appraisal (**Annex B1**) and detailed design (**Annexes B2 and B3**) stages of the proposed Scheme relevant to this HRA.

Annexes B4 and B5 include advice received from Defra and Natural England confirming that coastal schemes delivering SMP and Strategy policies that have been through the HRA process, including the derogation tests, and have been approved by the Secretary of State, do not require another Secretary of State approval as the alternatives and IROPI tests have already been agreed at the plan and strategic level.

Advice received from Natural England in relation to the Solent and Dorset Coast pSPA vulnerability assessment for flood and coastal erosion risk management schemes is also provided in **Annex B6**.

B1. Natural England's advice during the Option Development phase of the proposed Scheme

B2. Natural England’s advice on refined concept designs

B3. Natural England's advice on a potential alternative sea wall alignment for Frontage 4

B4. Advice from Defra confirming that the SMP and Strategy IROPI case is sufficient and there is no need to revisit the IROPI grounds again at the FCERM scheme level

B5. Advice from Natural England on HRA process for FCERM Schemes delivering approved SMP and Strategy policy

B6. Natural England's advice on the Solent and Dorset Coast pSPA vulnerability assessment for flood and coastal erosion risk management schemes

Annex C: SMP and PEMS derogation confirmation letters

This Annex includes the Secretary of State approval letters for the North Solent Shoreline Management Plan (SMP) and the Portchester Castle to Emsworth Flood and Erosion Management Strategy (PEMS).

C1. North Solent SMP Secretary of State derogation confirmation letter

C2. PEMS Secretary of State derogation confirmation letter