



Appendix C - Langstone Information for HRA



Langstone Flood and Coastal Erosion Risk Management (FCERM) Scheme

Information for Habitats Regulations Assessment

February 2025

Project	Langstone FCERM Scheme
Title	Information for HRA
Reference	LDW42220_HRA

Document History

Date	Revision	Prepared	Approved	Notes
17/06/2024	1.0	Zoe Palmer & Hilary Crane	Gavin Holder	For consent applications
31/01/2025	2.0	Hilary Ferres	Hannah Jackson	Updated for Frontage 2 redesign
27/02/2025	3.0	Hilary Ferres	Hannah Jackson	Updated construction dates



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 (172m²), 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 172m² 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

Page left intentionally blank

CONTENTS

1. Introduction	1
1.1 Background to the Langstone FCERM Scheme	1
1.2 Information for Habitats Regulations Assessment.....	2
2. Overview of the Habitat Regulations Assessment Process and Methodology	4
2.1 Overview of the Habitat Regulations	4
2.2 The Habitat Regulations Assessment Process	4
2.3 Methodology for Assessment of the Langstone FCERM Scheme	5
3. Description of the Langstone FCERM Scheme	7
3.1 Background to the Scheme and Options Appraisal.....	7
3.2 Description of the Recommended Options and Detailed Design for the Langstone FCERM Scheme	9
4. Background Information on the Relevant European Sites	11
4.1 Solent Maritime SAC	13
4.2 Chichester and Langstone Harbours - SPA and Ramsar	15
4.2.1 Chichester and Langstone Harbours SPA	15
4.2.2 Chichester and Langstone Harbours Ramsar.....	17
4.3 Functionally Linked Land (SPA/Ramsar supporting habitat outside of the European sites)	17
4.3.1 Solent Wader and Brent Goose Strategy (SWBGS) sites.....	18
4.3.2 Solent Bird Studies sites	18
5. Stage 1 - Screening	21
5.1 Management Test.....	21
5.2 Test of Likely Significant Effect	21
5.2.1 Screening features and supporting habitats	22
5.2.2 Screening low risk pressures.....	22
5.2.3 Screening remaining Feature-Activity-Pressure interactions.....	26
5.3 Screening Conclusion.....	38
5.3.1 Solent Maritime SAC	38
5.3.2 Chichester and Langstone Harbours SPA and Ramsar site	39
6. Stage 2 - Appropriate Assessment and Integrity Test	41
6.1 Conservation Objectives for the Solent Maritime SAC	41
6.1.1 High Level Conservation Objectives.....	41
6.1.2 Supplementary Advice on Conservation Objectives	42
6.2 Conservation Objectives for the Chichester and Langstone Harbours SPA and Ramsar site	42

6.2.1	High Level Conservation Objectives	42
6.2.2	Supplementary Advice on Conservation Objectives	42
6.3	Appropriate Assessment of the Langstone FCERM Scheme on the Solent Maritime SAC	43
6.4	Appropriate Assessment of the Langstone FCERM Scheme on the Chichester and Langstone Harbours SPA and Ramsar site	51
6.5	Integrity Test.....	64
7.	Derogation under Article 6(4) of the Habitats Directive	68
7.1	Stage 3 - Consideration of Alternatives.....	68
7.1.1	Objectives of the proposed scheme	69
7.1.2	Consideration of alternatives in setting the Hold the Line (HTL) policy option.....	69
7.1.3	Consideration of alternatives in designing the implementation of the HTL policy	70
7.2	Stage 4 - Imperative Reasons of Over-Riding Public Interest (IROPI) and Compensatory Measures	71
7.2.1	Imperative Reasons of Over-riding Public Interest (IROPI).....	71
7.2.2	Compensatory Measures	72
8.	Conclusion.....	74
9.	References	75
	Annex A: Advice on Operations Screening Tables.....	77
A1.	Solent Maritime SAC.....	78
A2.	Chichester and Langstone Harbours SPA and Ramsar site	91
	Annex B: Natural England and Defra advice	104
B1.	Natural England's advice during the Option Development phase of the proposed Scheme	105
B2.	Natural England's advice on refined concept designs	136
B3.	Natural England's advice on a potential alternative sea wall alignment for Frontage 4	142
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.....	146
B5.	Advice from Natural England on HRA process for FCERM Schemes delivering approved SMP and Strategy policy	150
B6.	Natural England's advice on the Solent and Dorset Coast pSPA vulnerability assessment for flood and coastal erosion risk management schemes.....	152
	Annex C: SMP and PEMS derogation confirmation letters	157
C1.	North Solent SMP Secretary of State derogation confirmation letter	158
C2.	PEMS Secretary of State derogation confirmation letter	161

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.

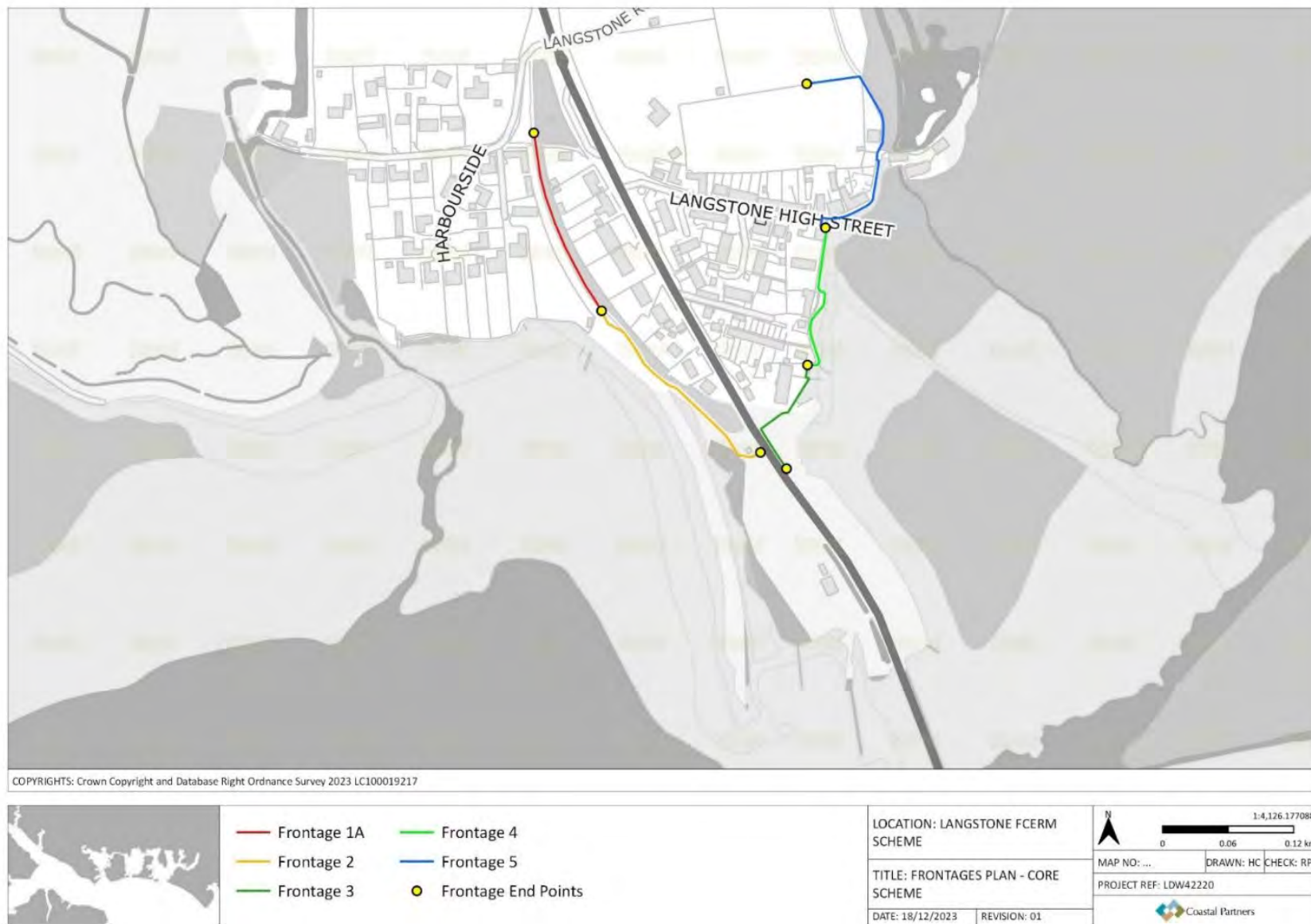


Figure 1.1: The location and extent of the Langstone FCERM Scheme.

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 is 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 AEOL 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)	- o Setback floodwall - o Setback earth embankment
3 (A3023 to The Look Out)	- o Flip-up floodwall - o Demountable defences - o Flood gate - o Setback flood wall with/without a glass crest (around edge of car park) - o Flip-up floodwall (across car park) - o Vertical floodwall with glass crest
4 (The Look Out to The Winklemarket)	- o Setback floodwall adjacent to the garden wall, with a timber boardwalk in-front of the footpath - o Replace / reinforce the existing garden walls at the back of the footpath - o Flip-up floodwall adjacent to the footpath - o Demountable defences adjacent to the footpath - o Frontline vertical floodwall with glass crest - o Floodwall with a boardwalk (front of grassed area) - o Self-raising flood barrier (front of grassed area) - o Flood proofing of the existing residential building (at the Winklemarket)
5 (High Street to Field North of Royal Oak)	- o Flip-up floodwall - o Demountable defences - o Flood gate - o Flip-up flood barrier defence - o Frontline floodwall of the existing defences - o Flood proofing the walls of the Royal Oak and adjacent buildings and reinforce or replace the garden / boundary walls - o Setback floodwall - o 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 expected to be undertaken primarily over two spring/summer periods (April 2026 to September 2026 and April 2027 to September 2027) with some lower impact activities not requiring heavy machinery being undertaken during the autumn / winter months. However, the programme of works is subject to change and will be confirmed by the contractor once appointed.

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 (<i>Spartina</i> spp.)	The Solent Maritime SAC is the only site in the UK where smooth cordgrass (<i>Spartina alterniflora</i>) is present. It is also one of only two sites where native small cordgrass (<i>Spartina maritima</i>) and Townsend's cordgrass (<i>Spartina townsendii</i>) are found. There are also extensive areas of common cordgrass (<i>Spartina anglica</i>) and, thus, all four <i>Spartina</i> species occur here in close proximity.
Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	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 (<i>Atriplex portulacoides</i>), common sea lavender (<i>Limonium vulgare</i>) and sea thrift (<i>Armeria maritima</i>), as well as common saltmarsh grass (<i>Puccinellia maritima</i>).
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 (<i>Zostera marina</i>), 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 (<i>Crepidula fornicata</i>).
<i>Salicornia</i> and other annuals colonizing mud and sand	The Solent Maritime SAC supports a significant presence of this pioneer saltmarsh habitat, which comprises glasswort (<i>Salicornia</i> species) and annual sea-blite (<i>Suaeda maritima</i>). 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 (<i>Zostera</i> species and <i>Ruppia marina</i>). Mud communities are present in the most sheltered areas of the site and are dominated by worms, bivalve molluscs and the mud snail <i>Hydrobia ulvae</i> . 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 (<i>Atriplex prostrata</i>) or grass-leaved orache (<i>Atriplex littoralis</i>) on the seaward side of the shingle. The second is a community dominated by sea sandwort (<i>Honkenya peploides</i>) and sea rocket (<i>Cakile maritima</i>) 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 (<i>Rumex crispus</i>) and yellow-horned poppy (<i>Glaucium flavum</i>) community or an associated transition or variation.
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("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 <i>Vertigo moulinsiana</i>	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, <i>Sterna albifrons</i> - 109 pairs representing up to 5.7% of the UK breeding population (5 year mean 1982 – 1986).
	Common tern, <i>Sterna hirundo</i> - 126 pairs representing up to 1.1% of the UK breeding population (5 year mean 1982 – 1986).
	Sandwich tern, <i>Sterna sandvicensis</i> - 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.)
This site also qualifies under Article 4.2 of the Directive	Bar-tailed godwit, <i>Limosa lapponica</i> – 1,491 individuals representing up to 3.9% of the GB breeding population
	Northern pintail, <i>Anas acuta</i> – 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, <i>Anas clypeata</i> – 124 individuals representing 0.7% of the GB population
	Eurasian teal, <i>Anas crecca</i> – 2,553 individuals representing 1% of the North-western Europe population
	Eurasian wigeon, <i>Anas penelope</i> – 3,947 individuals representing 0.9% of the GB population (5 year peak mean 2010/11 – 2014/15)
	Ruddy Turnstone, <i>Arenaria interpres</i> – 564 individuals representing 1.2% of the GB population
	Dark-bellied Brent Goose, <i>Branta bernicla bernicla</i> – 17,712 individuals representing 12% of the Western Siberia/Western Europe population
	Sanderling, <i>Calidris alba</i> – 407 individuals representing 3.1% of the Eastern Atlantic/Western & Southern Africa wintering population
	Dunlin, <i>Calidris alpina alpina</i> – 53,977 individuals representing 2.6% of the Northern Siberia/Europe/Western Africa population
	Common Ringed Plover, <i>Charadrius hiaticula</i> – 1,012 individuals representing 3% of the GB population
	Red-breasted merganser, <i>Mergus serrator</i> – 366 individuals representing 4.4% of the GB population (5 year peak mean 2010/11 – 2014/15)
	Eurasian Curlew, <i>Numenius arquata</i> – 2,937 individuals representing 2.1% of the GB population
	Grey Plover, <i>Pluvialis squatarola</i> – 3,271 individuals representing 3.9% of the Eastern Atlantic wintering population
	Common Shelduck, <i>Tadorna tadorna</i> – 4,287 individuals representing 4% of the North-western Europe population
	Common Redshank, <i>Tringa totanus</i> – 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 <i>Anas penelope</i> , Bar-tailed Godwit <i>Limosa lapponica</i> , Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> , Common Ringed Plover <i>Charadrius hiaticula</i> , Grey Plover <i>Pluvialis squatarola</i> , Dunlin <i>Calidris alpina alpina</i> , Redshank <i>Tringa totanus</i> , Shelduck <i>Tadorna tadorna</i> , Curlew <i>Numenius arquata</i> , Teal <i>Anas crecca</i> , Pintail <i>Anas acuta</i> , Shoveler <i>Anas clypeata</i> , Red-breasted Merganser <i>Mergus serrator</i> , Ruddy turnstone <i>Arenaria interpres</i> , Sanderling <i>Calidris alba</i> .

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, <i>Charadrius hiaticula</i>	853 individuals, representing an average of 1.1% of the population
	Black-tailed godwit, <i>Limosa limosa islandica</i>	906 individuals, representing an average of 2.5% of the population
	Common redshank, <i>Tringa totanus totanus</i>	2,577 individuals, representing an average of 1% of the population
	Peak counts winter:	
	Dark-bellied Brent goose, <i>Branta bernicla bernicla</i>	12,987 individuals, representing an average of 6% of the population
	Common shelduck, <i>Tadorna tadorna</i>	1,468 individuals, representing an average of 1.8% of the GB population
	Grey plover, <i>Pluvialis squatarola</i>	3,043 individuals, representing an average of 1.2% of the population
	Dunlin, <i>Calidris alpina alpina</i>	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.

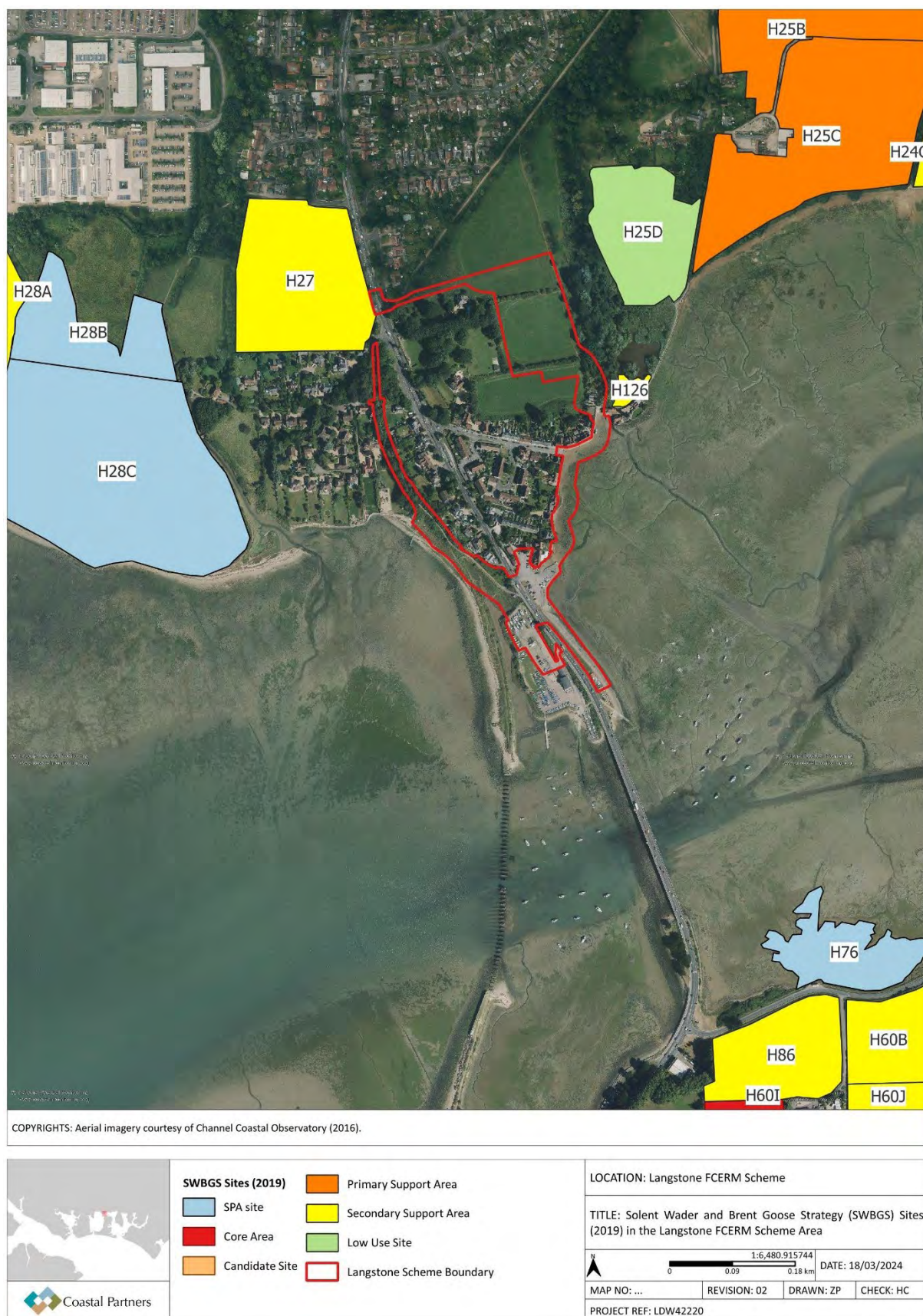


Figure 4.2: SWBGS sites in the Langstone FCERM Scheme area.

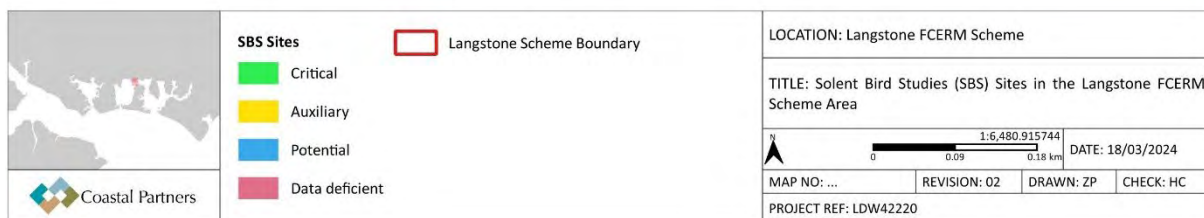


Figure 4.3: Solent Bird Studies sites in the Langstone FCERM Scheme area.

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 <i>Ammophila arenaria</i>	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 $\geq 50\%$ 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** 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 (AEOL) 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 <i>Spartina anglica</i> 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 <i>Spartina</i> swards are protected and excluded from the haul route / working areas to ensure this habitat is not damaged during the works. Where access is required on the foreshore, removable temporary haul routes will be installed (e.g., geotextile with sheet piles laid flat or aggregate on top) to minimise disturbance to the intertidal habitat. Methods will be finalised once a contractor has been appointed and will be confirmed within 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	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.		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. Methods will be finalised once a contractor has been appointed and confirmed within 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; Mudflats and sandflats not covered by seawater at low tide; Intertidal	Medium for saltmarsh Low for the Intertidal sand and muddy sand, intertidal mud, intertidal mixed sediments biotopes (A2.243,	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	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	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 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	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 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	No – the risk of excavation and remobilisation of contaminated sediments on the foreshore during the construction of the new sea wall is very low and will be managed as set out in the CEMP. Therefore, 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?
		mixed sediments; Intertidal mud; Intertidal sand and muddy sand	A2.312, A2.322, A2.411) present in Chichester and Langstone Harbours.		Range Low (ERL) threshold.	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).	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).	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.	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 (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;	High for saltmarsh features and seagrass beds Low for the vegetated shingle features, intertidal sediments and	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 different species within the habitat, e.g. affecting their abilities to feed or breathe.	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 siltation/smothering of habitats within the harbours. Reduced photosynthetic / feeding rates causes reduced growth rates, which, if prolonged, may lead to a reduction in	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 period (when the foreshore is exposed) to minimise	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

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 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	subtidal sediments	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.	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.	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.	for the North Portsea Island 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) 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.			
		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			

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?
						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), polychlorinated 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 landward (terrestrial) sample located in Frontage 2 had elevated levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding	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 significant impacts on water quality in the harbours. Machinery used during construction will be required to adhere to standard best	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 features) where the feature is dependent on estuarine water, ensure water quality	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 in the site. Water quality should be restored to mean winter dissolved inorganic nitrogen levels at which biological indicators of			

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?
				and quantity is restored to a standard that provides the necessary conditions to support the feature.	eutrophication do not affect the integrity of the site and features.	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.	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 component vegetation communities and associated transitions, allowing for	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- status and drainage) and vegetation management.			

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?
					successional changes in response to natural processes.				
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 – 521/12, C – 387/15 and C – 388/15). Therefore, habitat creation to offset this permanent loss via the HCRP	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 salt meadows; Spartina swards	High	Future extent of habitat within the site and ability to respond to seasonal changes	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 during particular seasons and usually as a result of natural coastal processes. Colonisation of annual			

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?
					species must be possible: this will reflect elevation of the marsh surface and degree of tidal exposure.			
			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	<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; Shoveler; Teal; Turnstone; Wigeon; Waterbird assemblage <u>Breeding features:</u> 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. <u>Non-breeding SPA/Ramsar birds:</u> 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	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.			
				Breeding population: abundance					
				Assemblage of species: abundance					
				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. Piling methods will be agreed and included as part of the final CEMP once a contractor has been appointed. 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	

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.	period. Details of this process will be laid out within the final CEMP. 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	Non-breeding features: 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. Piling methods will be agreed and included as part of the final CEMP once a contractor has been appointed. 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	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	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.			
				Breeding population: abundance					
				Assemblage of species: abundance					
				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	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 (e.g. Salmon, brook lamprey, minnow, gobies, eels, stickleback, flatfish, herring, sandeel, sprat) at preferred sizes (e.g.<11cm)	fitness and survival and the overall sustainability of the population.		(as set out for the above water noise impact above).	
3.	Visual disturbance	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 Breeding features: 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	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. Details of this watching brief will be included 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	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?
							likely to be susceptible to visual disturbance whilst foraging. The low 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.	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. Details of this process will be laid out within the final 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	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: abundance					
				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 roosting and feeding sites.	These features 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, ensure visibility of displaying behaviour and/or			

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?
						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)	Supporting habitat: landward grassland and wet woodland sites Relevant bird features: 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 considered to represent a significant impact.	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	Maintain a vegetation structure of key roost sites dominated by bare ground or a short sparsely-vegetated sward.	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: habitat structure	Maintain the extent and distribution of predominantly short grassland swards in areas used for feeding.				
				Supporting habitat: vegetation characteristics for feeding	Maintain the availability of grasslands in close proximity (typically <50 m) to open water.				
				Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. earthworm, leatherjacket, grassland/marsh invertebrates, <i>Agrostis stolonifera</i> , <i>Lolium perenne</i> , <i>Trifolium repens</i> .	The availability of an abundant food supply is critically important for 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.			

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?
				<i>Scirpus, Eleocharis palustris, Polygonum, Rumex, Carex, Potamogeton and Glyceria</i>) at preferred sizes.	Food/prey in grassland sites includes			
			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. Each component makes a different contribution to the diversity of the assemblage and changes to some components may 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?
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 <i>Spartina anglica</i> 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 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.	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 <i>Spartina</i> swards are protected and excluded from the haul route / working areas to ensure this habitat is not damaged during the works. Where access is required on the foreshore, removable temporary haul routes will be installed (e.g., geotextile with sheet piles laid flat or aggregate on top) to minimise disturbance to the intertidal habitat and accelerate recovery upon reinstatement. 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 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 redevelopment of intertidal habitats. Methods will be finalised once a contractor has been appointed and confirmed within the final CEMP.	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 winters of the construction works 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 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: abundance					
				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			

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?
					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)	<u>Bird features (direct impacts):</u> Common tern; Little tern; Sandwich tern; Red-breasted merganser; Waterbird assemblage <u>Supporting habitats (indirect impacts):</u> 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.	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.			
				Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items at preferred sizes.			
				Supporting habitat: extent and distribution of supporting	Restore the extent, distribution and availability of suitable habitat which supports 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?
				habitat for the breeding and non-breeding seasons	feature for all necessary stages of the breeding or non-breeding / wintering period as applicable.	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, Redshank, Ringed plover, Sanderling, Sandwich tern, Shelduck, Shoveler, Teal, Turnstone, Wigeon,	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 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.	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 significant impacts on water quality in the harbours. - Machinery used during construction will be required to	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 availability of prey may adversely affect the population and alter the distribution of birds.			
				Non-breeding population: abundance	Maintain or restore (dependent on species) the size of the non-breeding or	This will sustain the site's population and contribute to a viable local, national and bio-geographic population.			

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?
		Waterbird assemblage		Breeding population: abundance Assemblage of species: abundance	breeding population, whilst avoiding deterioration from its current level	Maintaining or restoring bird abundance depends on the suitability of the site.	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.	adhere to standard best practice measures including pollution control strategies and spillage response.	
				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 freshwater habitat) Physical loss due to coastal squeeze	<u>Supporting habitats:</u> Intertidal sediments; Saltmarsh; Water column; Functionally linked landward grassland and wet woodland (SBS sites) <u>Relevant bird features:</u> Bar-tailed godwit; Curlew; Dark-bellied brent goose; Dunlin; Grey plover; Pintail; Red-breasted merganser; Redshank; Ringed plover;	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 to its use for vehicular access and is therefore not 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	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 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	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. 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
				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			

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?
	Sanderling; Shelduck; Shoveler; Teal; Turnstone; Wigeon; Waterbird assemblage; Common tern; Little tern; Sandwich tern				water area, and associated marginal habitat, can adversely affect the suitability of supporting open water habitat.	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 139m ² (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 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	Building heritage requirements and constraints on cladding and finishes. Therefore, the 172m ² 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.	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?
							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 will be produced once a contractor has been appointed and will be 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 to ensure this habitat is not damaged during the works. 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. Methods will be finalised once a contractor has been appointed and will be confirmed within the final CEMP.

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:
- o 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.
 - o In Frontage 2, no construction work to be undertaken during the overwintering bird period October-March inclusive.
 - o 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.
 - o In Frontage 4, no construction work to be undertaken during the overwintering bird period October-March inclusive.
 - o 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. Details of this watching brief will be included within the final 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. Details of this process will be laid out within the final 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 172m² 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**).

9. References

AECOM (2018a) Langstone FCERM Scheme: Long List Options Report. Available online: <https://coastalpartners.org.uk/static/media/resources/langstone-long-list-options-report-1.pdf>. [Accessed 22/02/2024].

AECOM (2018b) Langstone FCERM Scheme: Short List Options Report. Available online: <https://coastalpartners.org.uk/static/media/resources/langstone-short-list-options-report-1.pdf>. [Accessed 22/02/2024].

AECOM (2019a) Langstone FCERM Scheme: Preferred Option report. Available online: <https://coastalpartners.org.uk/static/media/resources/langstone-preferred-option-report.pdf>. [Accessed 22/02/2024].

AECOM (2019b) Langstone FCERM Scheme: Outline Design and Decision Criteria Report. November 2019. 50pp.

AECOM (2024a) Langstone FCERM Scheme: Detailed Design Report. March 2024. 156pp.

AECOM (2024b) Langstone FCERM Scheme: Materials Report. March 2024. 33pp.

AECOM (2024c) Langstone FCERM Scheme: Drainage Strategy. March 2024. 56pp.

Coastal Partners (2020) Langstone FCERM Scheme – Environmental Scoping Report, November 2020.

DEFRA (2023) Habitats regulations assessments: protecting a European site. Available online: <https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site>. [Accessed 22/02/2024].

Eastern Solent Coastal Partnership (ESCP) (2018) Langstone FCERM scheme: Preliminary Ecological Appraisal, July 2018, 35pp.

European Commission (2019) Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Available online: <https://op.europa.eu/en/publication-detail/-/publication/11e4ee91-2a8a-11e9-8d04-01aa75ed71a1>. [Accessed 12/06/2024].

European Commission (2021) Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Available online: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC1028\(02\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC1028(02)&from=EN). [Accessed 22/02/2024].

JNCC (1987) Ramsar Information Sheet – Chichester and Langstone Harbours. Available online: <https://jncc.gov.uk/jncc-assets/RIS/UK11013.pdf>. [Accessed 23/04/2024].

JNCC (2015) Standard Data Form for sites within the UK national site network of European sites – Solent Maritime SAC. Available online: <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0030059.pdf>. [Accessed 23/04/2024].

King, D. (2010) Solent Waders and Brent Goose Strategy 2010. Hampshire and Isle of Wight Wildlife Trust.

Natural England (2019) Conservation Advice for Marine Protected Areas – Chichester and Langstone Harbours Ramsar site. Available online: <https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK11013&SiteName=chichester&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>. [Accessed 26/02/2024].

Natural England (2021) Guidance on how to use Natural England's Conservation Advice Packages in Environmental Assessments. Available online: [https://designatedsites.naturalengland.org.uk/pdfs/Guidance on how to use Natural England's Conservation Advice Packages for Environmental Assessments.pdf](https://designatedsites.naturalengland.org.uk/pdfs/Guidance%20on%20how%20to%20use%20Natural%20England's%20Conservation%20Advice%20Packages%20for%20Environmental%20Assessments.pdf). [Accessed 22/02/2024].

Natural England (2023a) Conservation Advice for Marine Protected Areas - Solent Maritime SAC. Available online. <https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK030059&SiteName=solent&countyCode=&responsiblePerson=>. [Accessed 26/02/2024].

Natural England (2023b) Conservation Advice for Marine Protected Areas – Chichester and Langstone Harbours SPA. Available online. <https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9011011&SiteName=solent&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=#adviceonops>. [Accessed 26/02/2024].

Nightingale, J., Rowsell, E., Crane, H., Robjohns, A. (2020) The Solent Bird Studies. Havant: East Solent Coastal Partnership.

Solent Waders and Brent Goose Strategy (SWBGS) (2024) Updated current use maps. Available online: <https://solentwbgs.wordpress.com/page/>. [Accessed 12/06/2024].

Tyldesley, D. and Chapman, C. (2013) The Habitats Regulations Assessment Handbook (July 2019 edition) UK DTA Publications Limited. Available online (subscription required): www.dtapublications.co.uk. [Accessed 12/06/2024].

Whitfield, D. (2019) Solent Waders and Brent Goose Strategy 2019 Interim Project Report: Year Two. Hampshire and Isle of Wight Wildlife Trust, Curdridge. Available online: <https://solentwbgs.files.wordpress.com/2019/05/swbgs-2019-interim-report-year-two-dw.pdf>. [Accessed 18/03/2024].

Whitfield, D. (2020) Solent Waders and Brent Goose Strategy Hampshire and Isle of Wight Wildlife Trust. Curdridge. Available online: <https://solentwbgs.files.wordpress.com/2021/03/solent-waders-brent-goose-strategy-2020.pdf>. [Accessed 18/03/2024].

Wicks, D. (2002) Brent Goose Strategy: South East Hampshire Coast. Hampshire Brent Goose Strategy Group, July 2002. Hampshire and Isle of Wight Wildlife Trust, Eastleigh.

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=&IFCAAarea=>).

A1. Solent Maritime SAC

Relevant activities - construction phase

Activity: Construction of coastal flood and erosion risk management schemes

Pressure Name (Red = medium to high risk White = low risk)	Annex I habitat																		Activity-Pressure (AP) Notes	Screening	Screening notes							
	Annual vegetation of drift lines	Perennial vegetation of stony banks	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Estuaries								Mud flats and sand flats			Sand banks											
						Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand	Intertidal seagrass beds	Intertidal coarse sediment				Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand	
Abrasion/disturbance of the substrate on the surface of the seabed	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	Installation of infrastructure will lead to penetration and abrasion of the seabed through the placement of the infrastructure itself, associated scour protection and the use of jack up barges and other installation vessels (Life Nature, 2005),(ABPmer, 2011). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Mooring chains from swinging moorings may scour the seabed as the mooring slackens and rotates with the tide. The anchors of large shipping and cargo vessels have been found to penetrate the seabed at depths up to approximately 1 m in trials. For example, for an 11.5 tonne anchor penetration of up to 0.88 m occurred in soft sediment when the anchor was dropped and dragged 87 m (Luger and Harkes, 2013). There is a tendency for the anchor to penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998). Typical maximum water depths for anchoring are between 100 m and 150 m.	Screened in	Medium-High risk pressure. Direct disturbance of vegetated shingle, intertidal sediments and saltmarsh habitat within the SAC may occur during the construction of the new sea defences. There will be no direct abrasion / disturbance of subtidal sediments or intertidal seagrass beds. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.
Barrier to species movement	LS	LS	LS	LS	LS	LS	LS	LS			NS	NS	NS	NS	NS	NS			NS	NS	NS	NS	NS	NS		The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on case-by-case basis to determine relevance to given feature/site. Noise arising from long-lived operations can also alter migration routes of sensitive species (Joint Nature Conservation Committee (JNCC), 2010). Coastal development can result in barriers to species movement through increase noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuk et al., 2012). Coastal defences can also result in barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006).	Screened out	Medium-High risk pressure but the construction of the new sea defences will not restrict the dispersion/supply of seeds or propagules required for the maintenance or regeneration of SAC vegetated shingle and saltmarsh habitats. SAC intertidal / subtidal sediment habitats are not sensitive to this pressure.
Changes in suspended solids (water clarity)	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	Structures placed in the marine environment as a result of coastal defence can be buried into the seabed (such as piles or the foundations of concrete seawalls) (Scottish Natural Heritage (SNH), 2000),(Environment Agency (EA), 2013),(Sutherland et al., 2007). The placement and burial of structures can cause localised and temporary changes in suspended sediments. This is likely to lead to negligible increases in siltation rates in the direct vicinity of the works (ABPmer, 2009),(ABP Research and Consultancy Ltd., 1999),(ABPmer, 2008).	Screened in	Medium-High risk pressure. 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 SAC habitats.
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	Installation of infrastructure will lead to penetration and abrasion of the seabed through the placement of the infrastructure itself, associated scour protection and the use of jack up barges and other installation vessels (Life Nature, 2005),(ABPmer, 2011). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Mooring chains from swinging moorings may scour the seabed as the mooring slackens and rotates with the tide. The anchors of large shipping and cargo vessels have been found to penetrate the seabed at depths up to approximately 1 m in trials. For example, for an 11.5 tonne anchor penetration of up to 0.88 m occurred in soft sediment when the anchor was dropped and dragged 87 m (Luger and Harkes, 2013). There is a tendency for the anchor to penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998). Typical maximum water depths for anchoring are between 100 m and 150 m.	Screened in	Medium-High risk pressure. Direct disturbance and excavation of vegetated shingle, intertidal sediments and saltmarsh habitat within the SAC may occur during the construction of the new sea defences. There will be no direct excavation or disturbance of subtidal sediments or intertidal seagrass beds. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.
Physical change (to another seabed type)																										Construction of structures may result in areas of scour/erosion or alternatively areas of siltation/accretion of sediment, causing disturbance, changes to seabed or siltation (Paganelli et al., 2013),(Rogers et al., 2010),(Bray, 2008),(EUROSION Project, 2004),(Govarets and Lauwaert, 2009),(OSPAR Commission, 2008).	Screened out	Medium-High risk pressure, however this pressure is not relevant for the SAC features and sub-features present within and adjacent to the Langstone frontage.

[illegible]

Deoxygenation			NS	NS	NS	NS	NS	NS	NS	NS	S	NS	S	S	S	S	NS	NS	S	NS	S	S	S	S	There are several sources of organic and nutrient enrichment in the marine environment: outflows of domestic/industrial origin, sludge, sediment resuspension, aquaculture food and faeces, and others. Sediment mobilisation during dredging can increase the levels of organic matter and nutrients (ABP Research and Consultancy Ltd., 1999),(Lohrer and Wetz, 2003); however, the effect is usually highly restricted in time and space (Centre for Environment, 2011). The extent of impacts is determined from the quantity and quality of the input and environmental conditions at the location (Holmer, 1992). However, magnitude of pressure would depend on intensity/scale of activity and hydrographic conditions (European Commission, 2012),(Bouwman et al., 2013),(Wilding and Hughes, 2010),(Holmer, 1992). Disposal of waste material into the marine environment includes the regulated discharge of wastewater and the disposal of hazardous and non-hazardous waste (UK Marine Monitoring and Assessment Strategy Community (UKMMAS), 2010).	Screened in	Low risk pressure. However, 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 construction activities are not likely to cause significant deoxygenation effects. However, intertidal and subtidal sediments are sensitive to deoxygenation. This pressure has therefore been screened in on a precautionary basis. SAC saltmarsh features are not sensitive to this pressure. The proposed Scheme works do 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 enrichment are anticipated as part of the works.
Hydrocarbon & PAH contamination	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Pressure primarily relates to vessels associated with this sub-activity and their movement. The primary chemicals of environmental concern in vessel oil and fuel are polycyclic aromatic hydrocarbons (PAHs). Deliberate discharges of oil or oil/water mixtures from ships are prohibited within the North West European Waters Special Area, established by the International Maritime Organization under MARPOL Annex I in 1999. This includes all waters around the UK and its approaches. However, accidental discharges still occur. Information on accidental discharges of oil from ships and offshore platforms is compiled annually by the Advisory Committee on Protection of the Sea (ACOPS) on behalf of the Maritime and Coastguard Agency. Although the majority of incidents are minor, several incidents occur annually that lead to the actual or potential release of significant amounts of oil (typically from large shipping vessels and tankers) (Defra and UK MMAS, 2010),(Ware, 2009),(The Green Blue, 2006),(The Green Blue, 2009).	Screened in	Low risk pressure and 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 Construction Environmental Management Plan (CEMP) for all Coastal Partners (CP) projects. However, several foreshore and landward 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 Probable Effects Level (PEL)). In addition, one terrestrial sample located in Frontage 2 had significant levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding the ISQG PEL. 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 the construction works if excavations are not managed carefully and undertaken in accordance with a contaminated land strategy and detailed methodology to prevent release of contaminated sediments and/or leachate into the marine environment.

Activity: Piling

Pressure Name (Red = medium to high risk White = low risk)	Annex I habitat																		Activity-Pressure (AP) Notes	Screening	Screening notes						
	Annual vegetation of drift lines	Perennial vegetation of stony banks	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Estuaries								Mud flats and sand flats				Sand banks									
						Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand	Intertidal seagrass beds	Intertidal coarse sediment				Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand
Abrasion/disturbance of the substrate on the surface of the seabed	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	Structures placed in the marine environment as a result of coastal defence can be buried into the seabed (such as piles or the foundations of concrete seawalls) (Scottish Natural Heritage (SNH), 2000),(Environment Agency (EA), 2013),(Sutherland et al., 2007).Piles used in coastal developments can be driven to depths of over -30 m Chart Datum. Tubular piles are typically 1-2 m in diameter with sheet piles typically 0.5-1 m in width and 0.1-0.2 m thick (ArcelorMittal, 2008),(BSI British Standards, 2009),(Nedwell et al., 2008),(ABPmer, 2008). Flat reflective surfaces such as sheet piling can also induce bed scour by reflecting waves.	Screened in	Medium-High risk pressure. Direct disturbance of vegetated shingle, intertidal sediments and saltmarsh habitat within the SAC may occur during the construction of the new sea defences. There will be no direct abrasion / disturbance of subtidal sediments or intertidal seagrass beds. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.	
Barrier to species movement	LS	LS	LS	LS	LS	LS	LS	LS			NS		NS	NS	NS	NS	NS		NS	NS	NS	NS	NS	The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on case-by-case basis to determine relevance to given feature/site. Noise arising from long-lived operations can also alter migration routes of sensitive species (Joint Nature Conservation Committee (JNCC), 2010). Coastal development can result in barriers to species movement through increase noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuk et al., 2012). Coastal defences can also result in barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006).	Screened out	Medium-High risk pressure but the construction of the new sea defences will not restrict the dispersion/supply of seeds or propagules required for the maintenance or regeneration of SAC vegetated shingle and saltmarsh habitats. SAC intertidal / subtidal sediment habitats are not sensitive to this pressure.	
Changes in suspended solids (water clarity)	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	Pile driving will cause a highly localised and temporary increase in suspended sediment levels in the direct vicinity of the works (ABPmer, 2009).	Screened in	Medium-High risk pressure. Marine piling activities in Frontages 3, 4 and 5 will cause localised disturbance of intertidal sediments during the construction of the new sea defences, which has the potential to result in localised increased suspended sediment concentrations within the water column that could affect SAC habitats.	
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	Installation of infrastructure will lead to penetration and abrasion of the seabed through the placement of the infrastructure itself, associated scour protection and the use of jack up barges and other installation vessels (Life Nature, 2005),(ABPmer, 2011). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Mooring chains from swinging moorings may scour the seabed as the mooring slackens and rotates with the tide. The anchors of large shipping and cargo vessels have been found to penetrate the seabed at depths up to approximately 1 m in trials. For example, for an 11.5 tonne anchor penetration of up to 0.88 m occurred in soft sediment when the anchor was dropped and dragged 87 m (Luger and Harkes, 2013). There is a tendency for the anchor to penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998). Typical maximum water depths for anchoring are between 100 m and 150m.	Screened in	Medium-High risk pressure. Direct disturbance and excavation of vegetated shingle, intertidal sediments and saltmarsh habitat within the SAC may occur during the construction of the new sea defences. There will be no piling within subtidal sediments or intertidal seagrass beds. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.	
Physical loss (to land or freshwater habitat)	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	Habitat change will occur due to placement of structures on the seabed (Wilhelmsson et al., 2010),(ABPmer, 2011),(OPSAR, 2008),(OSPAR Commission, 2008). The habitat may be changed to steel, concrete, rock or other substances depending on the type of foundation or scour protection. Piles are driven into the seabed (buried) and can change the seabed type within the footprint of the piling works from soft sediment to an artificial substratum (BSI British Standards, 2009),(Nedwell, 2007),(ABPmer, 2008),(ABPmer, 2009).	Screened in	Medium-High risk pressure. 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. A very small area of mid-upper saltmarsh will be lost under the footprint of the new sheet pile wall in Frontage 2, however this is area is not within the SAC so is not considered further within this HRA. 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.	
Smothering and siltation rate changes (Light)	NS	NS	NS	NS	NS	NS	NS	NS	LS	NS	LS	LS	LS	IF	LS	LS	LS	NS	LS	LS	LS	IF	LS	LS	Pile driving will cause a highly localised and temporary increase in suspended sediment levels in the direct vicinity of the works (ABPmer, 2009).	Screened in	Medium-High risk pressure. Piling activities will cause localised disturbance of intertidal sediments during the construction of the new sea defences, which has the potential to result in localised increased suspended sediment concentrations and associated siltation and smothering that could affect SAC habitats.

Underwater noise changes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Activity: Reclaim and land take (e.g. the footprint of coastal defences)

Pressure Name (Red = medium to high risk White = low risk)	Annex I habitat																				Activity-Pressure (AP) Notes	Screening	Screening notes				
	Annual vegetation of drift lines	Perennial vegetation of stony banks	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Estuaries							Mud flats and sand flats					Sand banks									
						Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand	Intertidal seagrass beds	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud				Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand
Abrasion/disturbance of the substrate on the surface of the seabed	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	Reclaim and land take may require structures to be placed on or be buried into the seabed (such as piles or the foundations of concrete seawalls) (Scottish Natural Heritage (SNH), 2000),(Environment Agency (EA), 2013),(Sutherland et al., 2007). Dredging/extraction might also be required, which disturb the seabed and in turn will result in abrasion and sediment disturbance (Bray, 2008),(ABPmer, 2008). Flat reflective surfaces may also induce bed scour by reflecting waves.	Screened in	Medium-High risk pressure. Direct disturbance of vegetated shingle, intertidal sediments and saltmarsh habitat within the SAC may occur during the construction of the new sea defences. There will be no direct abrasion / disturbance of subtidal sediments or intertidal seagrass beds. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.
Barrier to species movement	LS	LS	LS	LS	LS	LS	LS	LS			NS	NS	NS				NS		NS	NS	NS	NS	NS	NS	The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on case-by-case basis to determine relevance to given feature/site. Noise arising from long-lived operations can also alter migration routes of sensitive species (Joint Nature Conservation Committee (JNCC), 2010). Coastal development can result in barriers to species movement through increase noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuik et al., 2012). Coastal defences can also result in barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006).	Screened out	Medium-High risk pressure but the construction of the new sea defences will not restrict the dispersion/supply of seeds or propagules required for the maintenance or regeneration of SAC vegetated shingle and saltmarsh habitats. SAC intertidal and subtidal sediment habitats are not sensitive to this pressure.
Changes in suspended solids (water clarity)	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	The pressure will occur when activities are associated with input of additional sediment (Govarets and Lauwaert, 2009). Sediment is deliberately added to a foreshore and near shore environment. This will temporarily increase sediment levels in an area. In some areas the siltation rate will be high and in some areas this will be low. Dredged material is commonly used for coastal protection/beach nourishment/land reclaim projects and their maintenance (Scottish Natural Heritage (SNH), 2000),(Marine Management Organisation (MMO), 2014).	Screened in	Medium-High risk pressure. 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 SAC habitats.
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	Installation of infrastructure will lead to penetration and abrasion of the seabed through the placement of the infrastructure itself, associated scour protection and the use of jack up barges and other installation vessels (Life Nature, 2005),(ABPmer, 2011). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Mooring chains from swinging moorings may scour the seabed as the mooring slackens and rotates with the tide. The anchors of large shipping and cargo vessels have been found to penetrate the seabed at depths up to approximately 1 m in trials. For example, for an 11.5 tonne anchor penetration of up to 0.88 m occurred in soft sediment when the anchor was dropped and dragged 87 m (Luger and Harkes, 2013). There is a tendency for the anchor to penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998). Typical maximum water depths for anchoring are between 100 m and 150 m.	Screened in	Medium-High risk pressure. Direct disturbance and excavation of vegetated shingle, intertidal sediments and saltmarsh habitat within the SAC may occur during the construction of the new sea defences. There will be no direct excavation or disturbance of subtidal sediments or intertidal seagrass beds. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.
Physical change (to another seabed type)																									Coastal developments can result in the loss of marine habitat through land claim to create freshwater or terrestrial habitat. The footprint of any land claim is dependent on the scale of the project. For example, the Cardiff Barrage which was built as part of a dockland redevelopment project in 1999 involved the loss of c. 200 ha of intertidal habitat in Cardiff Bay and conversion to a freshwater lake. In Southampton Water berth extensions since the 1960s has reclaimed over 80 ha of sub tidal and intertidal habitat with individual projects varying in size from several hectares to over 40 ha (ABPmer, 2008).	Screened out	Medium-High risk pressure, however this pressure is not relevant for the SAC features and sub-features present within and adjacent to the Langstone frontage.
Physical change (to another sediment type)			LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	Coastal developments can result in the loss of marine habitat through land claim to create freshwater or terrestrial habitat. The footprint of any land claim is dependent on the scale of the project. For example, the Cardiff Barrage which was built as part of a dockland redevelopment project in 1999 involved the loss of c. 200 ha of intertidal habitat in Cardiff Bay and conversion to a freshwater lake. In Southampton Water berth extensions since the 1960s has reclaimed over 80 ha of sub tidal and intertidal habitat with individual projects varying in size from several hectares to over 40 ha (ABPmer, 2008).	Screened out	Medium-High risk pressure but no changes in sediment type will occur during the construction of the new sea defences. Where foreshore material needs to be excavated to allow the construction of the new defences, this will be placed back either over the toe or in front of the new structures on completion of the works. Permanent loss of intertidal habitat from the encroachment of the new defences into the harbours has been assessed under the physical loss pressure. Potential indirect effects on intertidal sediment habitat from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.

Physical loss (to land or freshwater habitat)	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	Coastal developments can result in the loss of marine habitat through land claim to freshwater or terrestrial habitat. The footprint of any land claim is dependent on the scale of the project. For example, the Cardiff Barrage which was built as part of a dockland redevelopment project in 1999 involved the loss of c. 200 ha of intertidal habitat in Cardiff Bay and conversion to a freshwater lake. In Southampton Water berth extensions since the 1960s has reclaimed over 80 ha of sub tidal and intertidal habitat with individual projects varying in size from several hectares to over 40 ha (ABPmer, 2008).	Screened in	Medium-High risk pressure. 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. A very small area of mid-upper saltmarsh will be lost under the footprint of the new sheet pile wall in Frontage 2, however this is not within the SAC so is not considered further within this HRA. 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.	
Smothering and siltation rate changes (Heavy)	S	S	S	S	S	S	S	S	S	S	NS	S	S	S	S	S	S	S	S	S	NS	S	S	S	The pressure will occur when activities are associated with input of additional sediment (Govarets and Lauwaert, 2009). Sediment is deliberately added to a foreshore and near shore environment. This will temporarily increase sediment levels in an area. In some areas the siltation rate will be high and in some areas this will be low. Dredged material is commonly used for coastal protection/beach nourishment/land reclaim projects and their maintenance (Scottish Natural Heritage (SNH), 2000),(Marine Management Organisation (MMO), 2014).	Screened in	Medium-High risk pressure. 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.	
Smothering and siltation rate changes (Light)	NS	NS	NS	NS	NS	NS	NS	NS	NS	S	NS	S	S	S	S	IE	S	S	S	NS	S	S	S	IE	S	The pressure will occur when activities are associated with input of additional sediment (Govarets and Lauwaert, 2009). Sediment is deliberately added to a foreshore and near shore environment. This will temporarily increase sediment levels in an area. In some areas the siltation rate will be high and in some areas this will be low. Dredged material is commonly used for coastal protection/beach nourishment/land reclaim projects and their maintenance (Scottish Natural Heritage (SNH), 2000),(Marine Management Organisation (MMO), 2014).	Screened in	Medium-High risk pressure. 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.
Underwater noise changes																NS	NS			NS	NS				If land reclaim involves piling this can create noise that may impact marine mammals and fish spawning and other sensitive life cycle stages. Important parameters are peak pressure, received energy (received sound pressure level), signal duration, spectral type, frequency (range), duty cycle, directionality and signal rise times. Possible effects on marine mammals can be divided into behavioural disturbance (including displacement), masking, and injury either as temporary threshold shift (TTS), permanent threshold shift (PTS) or other injuries such as tissue damage and, in extreme cases, death if the animal very close to pile-driving activities (OSPAR Commission, 2008). However, factors such as pile diameter, water depth, geology and sea bed topography can all influence noise generation and propagation so values are likely to vary from site to site (OSPAR Commission, 2008). Shipping is an important source of underwater noise. Although the majority of this will come from the propeller cavitation, on-board machinery and turbulence around the hull can also result in noise being transmitted underwater. Different part of the vessel and different vessels emit at different frequencies. Generally, lower frequency with increasing size. Low frequency sounds generally travel farther and have the potential of impacting larger areas.	Screened out	Medium-High risk pressure but SAC habitats are not sensitive to this pressure.	
Visual disturbance													NS		NS	NS			NS	NS					Vessels, vehicles and people movement can create visual stimuli which can evoke a disturbance response in mobile species such as marine mammals and seabirds (Chatwin et al., 2013),(Jansen et al., 2010). The magnitude of the pressure will depend on the nature and scale/intensity of the activity.	Screened out	Medium-High risk pressure but SAC habitats are not sensitive to this pressure.	
Water flow (tidal current) changes, including sediment transport considerations	NS	NS	NS	NS	NS	NS	NS	NS	NS	S	NS	S	S	S	NS	NS	NS	S	NS	S	S	S	NS	NS	NS	Structures added to the coastal environment as a result of coastal defence schemes, coastal developments, artificial reefs, etc., can change local flow conditions. In particular, cross shore structures such as groynes and harbour arms can intercept flow paths, causing flows to divert around or across the structures (ABPmer, 2009),(ABPmer, 2010),(ABPmer, 2014),(Bradbury and Picksley, 2013),(Bay., 2014),(Metoc Plc, 2010),(OSPAR Commission, 2008),(MeyGen Ltd., 2012).	Screened out	Medium-High risk pressure. However, no new cross-shore structures are proposed as part of the Scheme. The new defences will follow the existing alignment, albeit slightly seawards where encasement or sheet piles are required to ensure the stability of existing/new structures as part of the design. Therefore this pressure has been screened out of further assessment.
Wave exposure changes	S	S	NS	NS	NS	NS	NS	NS	NS	S	NS	NS	NS	NS	NS	NS	NS	S	NS	NS	NS	NS	NS	NS	NS	Structures added to the coastal environment as a result of coastal defence schemes, coastal developments, artificial reefs, etc., can change local flow conditions. In particular, cross shore structures such as groynes and harbour arms can intercept flow paths, causing flows to divert around or across the structures (ABPmer, 2009),(ABPmer, 2010),(ABPmer, 2014),(Bradbury and Picksley, 2013),(Bay., 2014),(Metoc Plc, 2010),(OSPAR Commission, 2008),(MeyGen Ltd., 2012). Changes in flow may also alter wave exposure. Land reclaim can cause wave attenuation to the project frontage, changing wave height in the local area. This includes sheltering effects on the lee of structures and increased wave reflection effects (ABPmer, 2010). Some coastal defence structures are designed specifically for this purpose, resulting in changes to wave height (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(Pontee et al., 2013),(Govarets and Lauwaert, 2009),(Adnitt et al., 2007). Changes to shore planform can also increase wave action on adjacent frontages via wave refraction.	Screened out	Medium-High risk pressure but the proposed scheme will not result in any changes to the wave climate within Langstone Harbour or Chichester Harbour as the frontage is located in a sheltered, low wave climate area at the top of the harbours and there are no cross shore structures proposed as part of the scheme.
Deoxygenation			NS	NS	NS	NS	NS	NS	NS	NS	NS	S	NS	S	S	S	S	NS	NS	S	NS	S	NS	S	S	There are several sources of organic and nutrient enrichment in the marine environment: outflows of domestic/industrial origin, sludge, sediment resuspension, aquaculture food and faeces, and others. Sediment mobilisation during dredging can increase the levels of organic matter and nutrients (ABP Research and Consultancy Ltd., 1999),(Lohrer and Wetz, 2003); however, the effect is usually highly restricted in time and space (Centre for Environment, 2011). The extent of impacts is determined from the quantity and quality of the input and environmental conditions at the location (Holmer, 1992). However, magnitude of pressure would depend on intensity/scale of activity and hydrographic conditions (European Commission, 2012),(Bouwman et al., 2013),(Wilding and Hughes, 2010),(Holmer, 1992). Disposal of waste material into the marine environment includes the regulated discharge of wastewater and the disposal of hazardous and non-hazardous waste (UK Marine Monitoring and Assessment Strategy Community (UKMMAS), 2010).	Screened in	Low risk pressure. However, 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 construction activities are not likely to cause significant deoxygenation effects. However, intertidal and subtidal sediments are sensitive to deoxygenation. This pressure has therefore been screened in on a precautionary basis. SAC saltmarsh features are not sensitive to this pressure. The proposed Scheme works do 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 enrichment are anticipated as part of the works.

Hydrocarbon & PAH contamination	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Pressure primarily relates to vessels associated with this sub-activity and their movement. The primary chemicals of environmental concern in vessel oil and fuel are polycyclic aromatic hydrocarbons (PAHs). Deliberate discharges of oil or oil/water mixtures from ships are prohibited within the North West European Waters Special Area, established by the International Maritime Organization under MARPOL Annex I in 1999. This includes all waters around the UK and its approaches. However, accidental discharges still occur. Information on accidental discharges of oil from ships and offshore platforms is compiled annually by the Advisory Committee on Protection of the Sea (ACOPS) on behalf of the Maritime and Coastguard Agency. Although the majority of incidents are minor, several incidents occur annually that lead to the actual or potential release of significant amounts of oil (typically from large shipping vessels and tankers) (Defra and UK MMAS, 2010),(Ware, 2009),(The Green Blue, 2006),(The Green Blue, 2009).	Screened in	Low risk pressure and 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 Construction Environmental Management Plan (CEMP) for all Coastal Partners (CP) projects. However, several foreshore and landward 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 Probable Effects Level (PEL)). In addition, one terrestrial sample located in Frontage 2 had significant levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding the ISQG PEL. 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 the construction works if excavations are not managed carefully and undertaken in accordance with a contaminated land strategy and detailed methodology to prevent release of contaminated sediments and/or leachate into the marine environment.
---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	--	-------------	--

Relevant activities - operational phase

Maintenance of hard coastal defences

Pressure Name (Red = medium to high risk White = low risk)	Annex I habitat																				Activity-Pressure (AP) Notes	Screening	Screening notes					
	Annual vegetation of drift lines	Perennial vegetation of stony banks	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Estuaries								Mud flats and sand flats				Sand banks										
						Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand	Intertidal seagrass beds	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud				Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand	
Abrasion/disturbance of the substrate on the surface of the seabed	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	Maintenance of coastal defences might require new/replacement structures to be placed and buried into the seabed (such as piles or the foundations of concrete seawalls) (Scottish Natural Heritage (SNH), 2000),(Environment Agency (EA), 2013),(Sutherland et al., 2007). Dredging/extraction might also be required, which disturb the seabed and in turn will result in abrasion and sediment disturbance (Bray, 2008),(ABPmer, 2008).	Screened in	Medium-High risk pressure. Direct disturbance of vegetated shingle, intertidal sediments and saltmarsh habitat within the SAC may occur if excavation of the foreshore is required for maintenance of the new sea defences. There will be no direct abrasion / disturbance of subtidal sediments or intertidal seagrass beds.	
Changes in suspended solids (water clarity)	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	Maintenance works might require dredging/extraction, which disturb the seabed and in turn will result in a temporary increase of suspended sediments (Bray, 2008),(ABPmer, 2008).	Screened in	Medium-High risk pressure. Excavation and disturbance of intertidal sediments may occur during maintenance 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.	
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	Maintenance works can result in dredging/extraction, abrasion/disturbance to seabed, losses to land through increased reclaim or footprint of structures and physical changes to seabed through presence of new or additional materials/sediment (Paganelli et al., 2013),(Rogers et al., 2010),(Bray, 2008),(EUROSION Project, 2004),(OSPAR Commission, 2008),(Govarets and Lauwaert, 2009),(OSPAR Commission, 2008). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Anchors may penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998).	Screened in	Medium-High risk pressure. Direct disturbance of vegetated shingle, intertidal sediments and saltmarsh habitat within the SAC may occur if excavation of the foreshore is required for maintenance of the new sea defences. There will be no direct abrasion / disturbance of subtidal sediments or intertidal seagrass beds.	
Smothering and siltation rate changes (Light)	NS	NS	NS	NS	NS	NS	NS	NS	NS	LS	NS	LS	LS	LS	IE	LS	LS	LS	NS	LS	LS	LS	IE	LS	LS	Maintenance works might require dredging/extraction of structures, which disturb the seabed and can result in a degree of siltation (Bray, 2008),(ABPmer, 2008).	Screened in	Medium-High risk pressure. Excavation and disturbance of intertidal sediments may be required during maintenance 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.
Underwater noise changes																NS	NS						NS	NS	Shipping is an important source of underwater noise. Although the majority of this will come from the propeller cavitation, onboard machinery and turbulence around the hull can also result in noise being transmitted underwater. Different part of the vessel and different vessels emit at different frequencies. Generally, lower frequency with increasing size. Low frequency sounds generally travel farther and have the potential of impacting larger areas. Seismic prospecting in the oil and gas industry, acoustic deterrents/harassing devices, turbine operation, piling, explosives, etc are all sources of underwater noise (OSPAR Commission, 2009),(Gill and Bartlett, 2010),(McKenna et al., 2012),(McKenna et al., 2013).	Screened out	Medium-High risk pressure but SAC habitats are not sensitive to this pressure.	
Visual disturbance													NS			NS	NS					NS		NS	Vessels, vehicles and people movement can create visual stimuli which can evoke a disturbance response in mobile species such as marine mammals and seabirds (Chatwin et al., 2013),(Jansen et al., 2010). The magnitude of the pressure will depend on the nature and scale/intensity of the activity.	Screened out	Medium-High risk pressure but SAC habitats are not sensitive to this pressure.	
Barrier to species movement	LS	LS	LS	LS	LS	LS	LS	LS			NS	NS	NS	NS	NS	NS				NS	NS	NS	NS	NS	NS	The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on a case-by-case basis to determine relevance to given feature/site. Coastal defences can also result in a barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Interseasonal correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006). Coastal development can result in barriers to species movement through increased noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuk et al., 2012).	Screened out	Low risk pressure. Maintenance of the new sea defences will not restrict the dispersion/supply of seeds or propagules required for the maintenance or regeneration of SAC vegetated shingle and saltmarsh habitats. SAC intertidal and subtidal sediment habitats are not sensitive to this pressure.

Hydrocarbon & PAH contamination	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	The primary chemicals of environmental concern in oil and fuel incidents are polycyclic aromatic hydrocarbons (PAHs). Deliberate discharges of oil or oil/water mixtures are prohibited within the North West European Waters Special Area, established by the International Maritime Organization under MARPOL Annex I in 1999. This includes all waters around the UK and its approaches. However, accidental discharges still occur. Information on accidental discharges of oil from ships and offshore platforms is compiled by the Advisory Committee on Protection of the Sea (ACOPS) on behalf of the Maritime and Coastguard Agency each year. Although the majority of incidents are minor, several incidents occur annually that have led to the actual or potential release of significant amounts of oil (typically from large shipping vessels and tankers). Moreover, antifouling compounds like TBT and copper wash from coatings with larger concentrations in heavily used shipping routes or within harbours (Helford Voluntary Marine Conservation Group, 2010),(Defra and UK MMAS, 2010),(European Commission, 2009),(Ware, 2009),(OSPAR Commission, 2009),(The Green Blue, 2009).	Screened in	Low risk pressure and 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 Construction Environmental Management Plan (CEMP) for all Coastal Partners (CP) projects. However, several foreshore and landward 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 Probable Effects Level (PEL)). In addition, one terrestrial sample located in Frontage 2 had significant levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding the ISQG PEL. 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 the construction works if excavations are not managed carefully and undertaken in accordance with a contaminated land strategy and detailed methodology to prevent release of contaminated sediments and/or leachate into the marine environment.
Vibration	IE	IE	IE	IE	IE	IE	IE	IE																			The pressure relates to the vibration produced by certain activities and does not include vessels as they are assumed not to be significant. Activities resulting in vibration are for example trenching for cable laying (Robinson et al., 2011), dredging as the draghead is carried over the seabed or grab is operated (Robinson et al., 2011); military activities and other developments involving explosives (Royal Navy and Joint Nature Conservation Committee (JNCC), 2013), oil and gas drilling (E&P Forum and UNEP, 1997),(UK Government, 2007), and activities involving piling (especially if vibropiling is used) (Associated British Ports (ABP), 2011),(Hawkins and Popper, 2012),(Govarets and Lauwaert, 2009).	Screened out	Low risk pressure. Intertidal and subtidal sediment habitats are not affected by this pressure and SAC saltmarsh and vegetated shingle habitats are not likely to be affected.

Operation of coastal flood and erosion risk management schemes

Pressure Name (Red = medium to high risk White = low risk)	Annex I habitat																				Activity-Pressure (AP) Notes	Screening	Screening notes				
	Annual vegetation of drift lines	Perennial vegetation of stony banks	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Estuaries										Mud flats and sand flats				Sand banks							
						Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand	Intertidal seagrass beds	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud				Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand
Barrier to species movement	S	S	S	S	S	S	S	S			NS	NS	NS	NS	NS	NS			NS	NS	NS	NS	NS	NS	The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on case-by-case basis to determine relevance to given feature/site. Coastal defences can also result in a barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006). Coastal development can result in barriers to species movement through increase noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuk et al., 2012).	Screened out	Medium-High risk pressure but the operation of the new sea defences will not restrict the dispersion/supply of seeds or propagules required for the maintenance or regeneration of SAC vegetated shingle and saltmarsh habitats. SAC intertidal and subtidal sediment habitats are not sensitive to this pressure.
Emergence regime changes, including tidal level change considerations	S	S	S	S	S	S	S	S	S	S	S	S	S	NS	S	NS	S	S	S	S	S	NS	S	NS	Coastal defence structures can result in changing coastal regime, and substantial schemes especially in estuaries could result in changes to tidal regime, and intertidal exposure, especially where associated with reclaim or dredging. Modification of the seabed morphology can also impact the water flow regime. Dredging activities can cause localised change to the hydrodynamic flow in an area. The magnitude of the effect will be related to the overall size (depth and area) of the excavation compared to the overall area of the system (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(Pontee et al., 2013),(Govarets and Lauwaert, 2009),(Adnitt et al., 2007),(Centre for Environment, 2011).	Screened out	Medium-High risk pressure but the proposed scheme does not involve dredging and it will not result in any changes to the tidal regime, water levels or the tidal prism within Langstone Harbour or Chichester Harbour.
Physical loss due to coastal squeeze			S	S	S	S	S	S	S	S	S	S	S				S	S	S	S	S				Coastal defence structures can result in loss of intertidal habitat due to coastal squeeze caused by sea level rise and hard structures preventing the roll back of habitats.	Screened in	This pressure is not listed within the AoO in the conservation advice package but has been included based on expert judgement and for completeness of the HRA. Loss of intertidal habitats due to coastal squeeze will occur from the implementation of the HTL policy for the Langstone frontage. However, this loss has been assessed at both the SMP and Strategy level and will be compensated for via the Solent and South Downs Habitat Compensation and Restoration Programme (HCRP).
Water flow (tidal current) changes, including sediment transport considerations	NS	NS	NS	NS	NS	NS	NS	NS	S	NS	S	S	S	NS	NS	NS	S	NS	S	S	S	NS	NS	NS	Structures placed in the marine environment immediately interact with the local current regime. Structures added to the coastal environment as a result of coastal defence schemes, coastal developments, artificial reefs, etc., can change local flow conditions. In particular, cross-shore structures such as groynes and harbour arms can intercept flow paths, causing flows to divert around or across the structures (ABPmer, 2009),(ABPmer, 2010),(ABPmer, 2014),(Bradbury and Picksley, 2013),(Bay., 2014),(Metoc Plc, 2010),(OSPAR Commission, 2008),(MeyGen Ltd., 2012). Coastal defence structures can result in changing coastal regime, and substantial schemes especially in estuaries could result in changes to tides/water flow, especially where associated with reclaim or dredging (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(Pontee et al., 2013),(Govarets and Lauwaert, 2009),(Adnitt et al., 2007).	Screened out	Medium-High risk pressure. However, no new cross-shore structures are proposed as part of the Scheme. The new defences will follow the existing alignment, albeit slightly seawards where encasement or sheet piles are required to ensure the stability of existing/new structures as part of the design.
Wave exposure changes	S	S	NS	NS	NS	NS	NS	NS	S	NS	NS	NS	NS	NS	NS	NS	S	NS	NS	NS	NS	NS	NS	NS	Structures used in coastal defence can cause wave attenuation to the project frontage, changing wave height in the local area. This includes sheltering effects on the lee of structures and increased wave reflection effects (ABPmer, 2010). Some coastal defence structures are designed specifically for this purpose, resulting in changes to wave height and the operation of structures will maintain this change (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(Pontee et al., 2013),(Govarets and Lauwaert, 2009),(Adnitt et al., 2007).	Screened out	Medium-High risk pressure but the proposed scheme will not result in any changes to the wave climate within Langstone Harbour or Chichester Harbour as the frontage is located in a sheltered, low wave climate area at the top of the harbours and there are no cross shore structures proposed as part of the scheme.
Abrasion/disturbance of the substrate on the surface of the seabed	S	S	S	S	S	S	S	S	S	NS	S	S	S	S	S	S	S	NS	S	S	S	S	S	S	The presence and operation of coastal flood defences can result in changes to sediment patterns with scour or erosion in some areas and siltation or accretion in others (Paganelli et al., 2013).	Screened out	Low risk pressure. There will be no direct abrasion or disturbance of SAC habitats during the operation of the proposed scheme. Potential for indirect effects from changes in water flows and scour/erosion or siltation/accretion has been assessed under the water flow changes and physical change to another sediment type pressures.
Changes in suspended solids (water clarity)	S	S	S	S	S	S	S	S	S	NS	S	S	S	S	S	S	S	NS	S	S	S	S	S	S	Presence and operation of schemes/structures may result in areas of scour/erosion or alternatively areas of siltation/accretion of sediment resulting in changes in sediment dynamics (Paganelli et al., 2013),(Rogers et al., 2010),(Bray, 2008),(EUROSION Project, 2004),(Govarets and Lauwaert, 2009),(OSPAR Commission, 2008).	Screened out	Low risk pressure. The operation of the new sea defences is not likely to result in changes to suspended sediment concentrations within the harbours.

Deoxygenation																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
-------------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

A2. Chichester and Langstone Harbours SPA and Ramsar site

Relevant activities - construction phase

Activity: Construction of coastal flood and erosion risk management schemes

Pressure Name (Red = medium to high risk White = low risk)	Bird																		Supporting habitat																		Activity-Pressure (AP) Notes	Screening	Screening notes
	Bar-tailed godwit, Non-breeding	Common tern, Breeding	Curllew, Non-breeding	Dark-bellied brent goose, Non-breeding	Dunlin, Non-breeding	Grey plover, Non-breeding	Little tern, Breeding	Pintail, Non-breeding	Red-breasted merganser, Non-breeding	Redshank, Non-breeding	Ringed plover, Non-breeding	Sanderling, Non-breeding	Sandwich tern, Breeding	Shelduck, Non-breeding	Shoveler, Non-breeding	Teal, Non-breeding	Turnstone, Non-breeding	Wigeon, Non-breeding	Freshwater and coastal grazing marsh	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal rock	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Water column						
Above water noise	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS															Noise arises from many activities in the marine environment which can evoke a disturbance response in marine mammals and birds (BirdLife International, 2012),(Rodgers and Schwikert, 2002),(Smit and Visser, 1993),(Southall et al., 2007). In relation to managed realignment the operation of vessels and vehicles used in coastal developments and flood defences (Paganelli et al., 2013),(Rogers et al., 2010),(Bray, 2008),(Cutts et al., 2013),(OSPAR Commission, 2008),(Govarets and Lauwaert, 2009),(ICES (International Council for Exploration of the Sea), 2009), as well as presence of people, may result in an increase in above water noise. However, the magnitude of the pressure will depend on the nature, scale, intensity and duration of the activity. Further, the impact of such disturbance on birds (Wildfowl and Wetlands Trust (WWT) Consulting, 2012) may be considered better captured by the pressure 'visual disturbance'.	Screened in	Medium-High risk pressure. Noise from the breaking out of existing structures, piling activities and from the use of heavy machinery during the construction of the new defences 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). The nearest tern breeding colony is located at the Oysterbeds on Hayling Island in Langstone Harbour, which is only approximately 500 metres away from the proposed scheme frontage.				
Abrasion/disturbance of the substrate on the surface of the seabed																			LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	Installation of infrastructure will lead to penetration and abrasion of the seabed through the placement of the infrastructure itself, associated scour protection and the use of jack up barges and other installation vessels (Life Nature, 2005),(ABPmer, 2011). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Mooring chains from swinging moorings may scour the seabed as the mooring slackens and rotates with the tide. The anchors of large shipping and cargo vessels have been found to penetrate the seabed at depths up to approximately 1 m in trials. For example, for an 11.5 tonne anchor penetration of up to 0.88 m occurred in soft sediment when the anchor was dropped and dragged 87 m (Luger and Harkes, 2013). There is a tendency for the anchor to penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998). Typical maximum water depths for anchoring are between 100 m and 150 m.	Screened in	Medium-High risk pressure. Direct disturbance of intertidal sediments and saltmarsh habitat within the SPA/Ramsar site may occur during the construction of the new sea defences. 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 Auxillary 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). There will be no direct abrasion / disturbance of subtidal sediments or intertidal seagrass beds as these habitats are not located within the works area. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.				
Barrier to species movement	LS	NS	LS	LS	LS	LS	LS	LS	LS	LS	LS	LS	NS	LS	NS	LS	LS	LS	LS	LS	LS	LS	NS		NS	NS	NS	NS	NS	NS	NS	LS	The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on case-by-case basis to determine relevance to given feature/site. Noise arising from long-lived operations can also alter migration routes of sensitive species (Joint Nature Conservation Committee (JNCC), 2010). Coastal development can result in barriers to species movement through increase noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuk et al., 2012). Coastal defences can also result in barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006).	Screened in	Medium-High risk pressure. There is potential for construction activities to cause a temporary barrier to bird movements between intertidal feeding areas and important landward feeding/roosting areas so this interaction has been screened in for further assessment for non-breeding SPA/Ramsar birds. 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 FCRM 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)		LS					LS		LS				LS		NS				LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	Structures placed in the marine environment as a result of coastal defence can be buried into the seabed (such as piles or the foundations of concrete seawalls) (Scottish Natural Heritage (SNH), 2000),(Environment Agency (EA), 2013),(Sutherland et al., 2007). The placement and burial of structures can cause localised and temporary changes in suspended sediments. This is likely to lead to negligible increases in siltation rates in the direct vicinity of the works (ABPmer, 2009),(ABP Research and Consultancy Ltd., 1999),(ABPmer, 2008).	Screened in	Medium-High risk pressure. 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.				
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion																			LS	LS	LS	LS	LS	LS	NS	LS	LS	LS	LS	LS	LS	LS	Installation of infrastructure will lead to penetration and abrasion of the seabed through the placement of the infrastructure itself, associated scour protection and the use of jack up barges and other installation vessels (Life Nature, 2005),(ABPmer, 2011). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Mooring chains from swinging moorings may scour the seabed as the mooring slackens and rotates with the tide. The anchors of large shipping and cargo vessels have been found to penetrate the seabed at depths up to approximately 1 m in trials. For example, for an 11.5 tonne anchor penetration of up to 0.88 m occurred in soft sediment when the anchor was dropped and dragged 87 m (Luger and Harkes, 2013). There is a tendency for the anchor to penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998). Typical maximum water depths for anchoring are between 100 m and 150 m.	Screened in	Medium-High risk pressure. Direct disturbance of intertidal sediments and saltmarsh habitat within the SPA/Ramsar site may occur during the construction of the new sea defences. There will also be 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 Auxillary 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). There will be no direct disturbance of subtidal sediments or intertidal seagrass beds as these habitats are not located within the works area. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.				

[illegible]

[illegible]

Activity: Piling

Pressure Name (Red = medium to high risk White = low risk)	Bird																		Supporting habitat										Activity-Pressure (AP) Notes	Screening	Screening notes					
	Bar-tailed godwit, Non-breeding	Common tern, Breeding	Curllew, Non-breeding	Dark-bellied brent goose, Non-breeding	Dunlin, Non-breeding	Grey plover, Non-breeding	Little tern, Breeding	Pintail, Non-breeding	Red-breasted merganser, Non-breeding	Redshank, Non-breeding	Ringed plover, Non-breeding	Sanderling, Non-breeding	Sandwich tern, Breeding	Shelduck, Non-breeding	Shoveler, Non-breeding	Teal, Non-breeding	Turnstone, Non-breeding	Wigeon, Non-breeding	Freshwater and coastal grazing marsh	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal rock	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand				Subtidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Water column
Above water noise	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S															Noise can arise from many activities in the marine environment. The use of machinery, vessels, explosives, people will result in an increase of above water noise. Some examples of sources of airborne noise are drilling rigs and support (E&P Forum and UNEP, 1997),(UK Government, 2007), vessels used in coastal developments and flood defences (Paganelli et al., 2013),(Rogers et al., 2010),(Bray, 2008),(Cutts et al., 2013),(OSPAR Commission, 2008),(Govarets and Lauwaert, 2009),(ICES (International Council for Exploration of the Sea, 2009), pilling (INCA, 2004),(Joint Nature Conservation Committee (JNCC) and Natural England, 2011), etc. However, the magnitude of pressure would depend on the scale, intensity and duration of the activity.	Screened in	Medium-High risk pressure. Noise from piling activities during the construction of the new defences 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). The nearest tern breeding colony is located at the Oysterbeds on Hayling Island in Langstone Harbour, which is only approximately 500 metres away from the proposed scheme frontage.	
Abrasion/disturbance of the substrate on the surface of the seabed																			S	S	S	S	S	S	NS	S	S	S	S	S	S	S	Structures placed in the marine environment as a result of coastal defence can be buried into the seabed (such as piles or the foundations of concrete seawalls) (Scottish Natural Heritage (SNH), 2000),(Environment Agency (EA), 2013),(Sutherland et al., 2007).Piles used in coastal developments can be driven to depths of over -30 m Chart Datum. Tubular piles are typically 1-2 m in diameter with sheet piles typically 0.5-1 m in width and 0.1-0.2 m thick (ArcelorMittal, 2008),(BSI British Standards, 2009),(Nedwell et al., 2008),(ABPmer, 2008). Flat reflective surfaces such as sheet piling can also induce bed scour by reflecting waves.	Screened in	Medium-High risk pressure. Direct disturbance of intertidal sediments and saltmarsh habitat within the SPA/Ramsar site may occur during the construction of the new sea defences. 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 Auxillary 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). There will be no direct abrasion / disturbance of subtidal sediments or intertidal seagrass beds as these habitats are not located within the works area. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.	
Barrier to species movement	S	NS	S	S	S	S	S	S	S	S	S	S	NS	S	NS	S	S	S	S	S	S	S	NS		NS	NS	NS	NS	NS	NS	NS	NS	S	The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on case-by-case basis to determine relevance to given feature/site. Noise arising from long-lived operations can also alter migration routes of sensitive species (Joint Nature Conservation Committee (JNCC), 2010). Coastal development can result in barriers to species movement through increase noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuk et al., 2012). Coastal defences can also result in barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006).	Screened in	Medium-High risk pressure. There is potential for piling activities to cause a temporary barrier to bird movements between intertidal feeding areas and important landward feeding/roosting areas so this interaction has been screened in for further assessment for non-breeding SPA/Ramsar birds. 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)		S					S		S				S		NS				S	S	S	S	S	S	NS	S	S	S	S	S	S	S	Pile driving will cause a highly localised and temporary increase in suspended sediment levels in the direct vicinity of the works (ABPmer, 2009).	Screened in	Medium-High risk pressure. 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.	
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion																			S	S	S	S	S	S	NS	S	S	S	S	S	S	S	Installation of infrastructure will lead to penetration and abrasion of the seabed through the placement of the infrastructure itself, associated scour protection and the use of jack up barges and other installation vessels (Life Nature, 2005),(ABPmer, 2011). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Mooring chains from swinging moorings may scour the seabed as the mooring slackens and rotates with the tide. The anchors of large shipping and cargo vessels have been found to penetrate the seabed at depths up to approximately 1 m in trials. For example, for an 11.5 tonne anchor penetration of up to 0.88 m occurred in soft sediment when the anchor was dropped and dragged 87 m (Luger and Harkes, 2013). There is a tendency for the anchor to penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998). Typical maximum water depths for anchoring are between 100 m and 150m.	Screened in	Medium-High risk pressure. Direct disturbance of intertidal sediments and saltmarsh habitat within the SPA/Ramsar site may occur during the construction of the new sea defences. There will also be 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 Auxillary 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). There will be no direct disturbance of subtidal sediments or intertidal seagrass beds as these habitats are not located within the works area. Potential for indirect effects on these habitats from changes in water flows and scour/erosion patterns has been assessed under the water flow changes pressure.	

[illegible]

[illegible]

Relevant activities - operational phase

Maintenance of hard coastal defences

Pressure Name (Red = medium to high risk White = low risk)	Bird																		Supporting habitat														Activity-Pressure (AP) Notes	Screening	Screening notes	
	Bar-tailed godwit, Non-breeding	Common tern, Breeding	Cullew, Non-breeding	Dark-bellied brent goose, Non-breeding	Dunlin, Non-breeding	Grey plover, Non-breeding	Little tern, Breeding	Pintail, Non-breeding	Red-breasted merganser, Non-breeding	Redshank, Non-breeding	Ringed plover, Non-breeding	Sanderling, Non-breeding	Sandwich tern, Breeding	Shelduck, Non-breeding	Shoveler, Non-breeding	Teal, Non-breeding	Turnstone, Non-breeding	Wigeon, Non-breeding	Freshwater and coastal grazing marsh	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal rock	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand				Water column
Above water noise	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S															Noise can arise from many activities in the marine environment. The use of machinery, vessels, explosives, people will result in an increase of above water noise. Some examples of sources of airborne noise are drilling rigs and support (E&P Forum and UNEP, 1997),(UK Government, 2007), vessels used to service aquaculture facilities (European Commission, 2012),(Olesiuk et al., 2012), vessels used in coastal developments and flood defences (Paganelli et al., 2013),(Rogers et al., 2010),(Bray, 2008),(Cutts et al., 2013),(OSPAR Commission, 2008),(Govarets and Lauwaert, 2009),(ICES (International Council for Exploration of the Sea, 2009), military activities, aggregate extraction (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), cabling operations (Merck and Wasserthal, 2009),(Ware, 2009), pilling (INCA, 2004),(Joint Nature Conservation Committee (JNCC) and Natural England, 2011), etc. However, the magnitude of pressure would depend on the scale, intensity and duration of the activity.	Screened in	Medium-High risk pressure. Noise from piling activities and from the use of heavy machinery during maintenance of the new defences 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). The nearest tern breeding colony is located at the Oysterbeds on Hayling Island in Langstone Harbour, which is only approximately 500 metres away from the proposed scheme frontage.	
Abrasion/disturbance of the substrate on the surface of the seabed																			S	S	S	S	S	S	NS	S	S	S	S	S	S		Maintenance of coastal defences might require new/replacement structures to be placed and buried into the seabed (such as piles or the foundations of concrete seawalls) (Scottish Natural Heritage (SNH), 2000),(Environment Agency (EA), 2013),(Sutherland et al., 2007). Dredging/extraction might also be required, which disturb the seabed and in turn will result in abrasion and sediment disturbance (Bray, 2008),(ABPmer, 2008).	Screened in	Medium-High risk pressure. Direct disturbance of intertidal sediments and saltmarsh habitat within the SPA/Ramsar site may occur if excavation of the foreshore or the use of heavy plant on the foreshore is required for maintenance of the new sea defences. There could also be abrasion/disturbance effects on functionally linked landward grassland and wet woodland areas used by SPA/Ramsar non-breeding species, if these areas are used by heavy machinery or to store materials during maintenance works. There will be no abrasion / disturbance of subtidal sediments or intertidal seagrass beds as these habitats are not located adjacent to the defences and therefore will not be within any works area for maintenance activities.	
Changes in suspended solids (water clarity)		S				S		S				S		NS					S	S	S	S	S	S	NS	S	S	S	S	S	S	S	Maintenance works might require dredging/extraction, which disturb the seabed and in turn will result in a temporary increase of suspended sediments (Bray, 2008),(ABPmer, 2008).	Screened in	Medium-High risk pressure. Excavation and disturbance of intertidal sediments may occur during maintenance 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.	
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion																			S	S	S	S	S	S	NS	S	S	S	S	S	S	S	Maintenance works can result in dredging/extraction, abrasion/disturbance to seabed, losses to land through increased reclaim or footprint of structures and physical changes to seabed through presence of new or additional materials/sediment (Paganelli et al., 2013),(Rogers et al., 2010),(Bray, 2008),(EUROSION Project, 2004),(OSPAR Commission, 2008),(Govarets and Lauwaert, 2009),(OSPAR Commission, 2008). Anchors cause damage to the seabed upon deploying the anchor and the subsequent dragging and locking in and also through the chain causing abrasion and scour whilst at anchor and upon recovery. Anchors may penetrate to deep depths in softer sediment as the opening of the anchor flukes prevents deep penetration in harder sediment (Allan, 1998).	Screened in	Medium-High risk pressure. Direct disturbance of intertidal sediments and saltmarsh habitat within the SPA/Ramsar site may occur if excavation of the foreshore or the use of heavy plant on the foreshore is required for maintenance of the new sea defences. There could also be abrasion/disturbance effects on functionally linked landward grassland and wet woodland areas used by SPA/Ramsar non-breeding species, if these areas are used by heavy machinery or to store materials during maintenance works. There will be no abrasion / disturbance of subtidal sediments or intertidal seagrass beds as these habitats are not located adjacent to the defences and therefore will not be within any works area for maintenance activities.	
Smothering and siltation rate changes (Light)																		NS	NS	NS	NS	S	S	NS	S	S	S	IE	S	S	S		Maintenance works might require dredging/extraction of structures, which disturb the seabed and can result in a degree of siltation (Bray, 2008),(ABPmer, 2008).	Screened in	Medium-High risk pressure. Excavation and disturbance of intertidal sediments may be required during maintenance 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.	
Underwater noise changes		IE		IE			IE	IE	S				IE	IE	IE	IE		IE						IE						NS	NS	NS	S	Shipping is an important source of underwater noise. Although the majority of this will come from the propeller cavitation, onboard machinery and turbulence around the hull can also result in noise being transmitted underwater. Different part of the vessel and different vessels emit at different frequencies. Generally, lower frequency with increasing size. Low frequency sounds generally travel farther and have the potential of impacting larger areas. Seismic prospecting in the oil and gas industry, acoustic deterrents/harassing devices, turbine operation, piling, explosives, etc are all sources of underwater noise (OSPAR Commission, 2009),(Gill and Bartlett, 2010),(McKenna et al., 2012),(McKenna et al., 2013).	Screened in	Medium-High risk pressure. Piling may be required for repairs to the sea wall during maintenance works. 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 red-breasted merganser.
Visual disturbance	S	S	S	S	S	S	S	S	S	S	S	S	S	NS	S	S	S							NS					NS	NS	NS	S	Vessels, vehicles and people movement can create visual stimuli which can evoke a disturbance response in mobile species such as marine mammals and seabirds (Chatwin et al., 2013),(Jansen et al., 2010). The magnitude of the pressure will depend on the nature and scale/intensity of the activity.	Screened in	Medium-High risk pressure. Maintenance activities have the potential to cause visual 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).	

Barrier to species movement	S	NS	S	S	S	S	S	S	S	S	S	S	NS	S	NS	S	S	S	S	S	S	S	S	NS			NS	NS	NS	NS	NS	NS	NS	S	The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on a case-by-case basis to determine relevance to given feature/site. Coastal defences can also result in a barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006). Coastal development can result in barriers to species movement through increased noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuk et al., 2012).	Screened in	Low risk pressure. Once operational, the new coastal defences are unlikely to cause an alteration to migration flyways or local flight passes (e.g. between roosting and feeding habitat) of SPA/Ramsar birds as they will be in the same location as the existing defences and there will only be a small increase in height of the sea wall relative to bird movements. However, there is potential for maintenance activities to cause a temporary barrier to bird movements between intertidal feeding areas and important landward feeding/roosting areas so this interaction has been screened in for further assessment for non-breeding SPA/Ramsar birds. Both Sandwich and common terns are classified as not sensitive to this pressure and maintenance 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 FCFRM scheme 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.
Hydrocarbon & PAH contamination	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	The primary chemicals of environmental concern in oil and fuel incidents are polycyclic aromatic hydrocarbons (PAHs). Deliberate discharges of oil or oil/water mixtures are prohibited within the North West European Waters Special Area, established by the International Maritime Organization under MARPOL Annex I in 1999. This includes all waters around the UK and its approaches. However, accidental discharges still occur. Information on accidental discharges of oil from ships and offshore platforms is compiled by the Advisory Committee on Protection of the Sea (ACOPS) on behalf of the Maritime and Coastguard Agency each year. Although the majority of incidents are minor, several incidents occur annually that have led to the actual or potential release of significant amounts of oil (typically from large shipping vessels and tankers). Moreover, antifouling compounds like TBT and copper wash from coatings with larger concentrations in heavily used shipping routes or within harbours (Helford Voluntary Marine Conservation Group, 2010),(Defra and UK MMAS, 2010),(European Commission, 2009),(Ware, 2009),(OSPAR Commission, 2009),(The Green Blue, 2009).	Screened in	Low risk pressure and 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 Construction Environmental Management Plan (CEMP) for all Coastal Partners (CP) projects. However, several foreshore and landward 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 Probable Effects Level (PEL)). In addition, one terrestrial sample located in Frontage 2 had significant levels of PAHs with one analyte (Dibenzo[a,h]anthracene) exceeding the ISQG PEL. Therefore, this pressure has been screened in for further assessment due to the potential for hydrocarbon contamination to affect SPA/Ramsar features and supporting habitats during the construction works if excavations are not managed carefully and undertaken in accordance with a contaminated land strategy and detailed methodology to prevent release of contaminated sediments and/or leachate into the marine environment.	
Vibration																				IE	IE	IE	IE									S	The pressure relates to the vibration produced by certain activities and does not include vessels as they are assumed not to be significant. Activities resulting in vibration are for example trenching for cable laying (Robinson et al., 2011), dredging as the draghead is carried over the seabed or grab is operated (Robinson et al., 2011); military activities and other developments involving explosives (Royal Navy and Joint Nature Conservation Committee (JNCC), 2013), oil and gas drilling (E&P Forum and UNEP, 1997),(UK Government, 2007), and activities involving piling (especially if vibropiling is used) (Associated British Ports (ABP), 2011),(Hawkins and Popper, 2012),(Govarets and Lauwaert, 2009).	Screened out	Low risk pressure. Piling, especially vibro-piling, for repairs to the new sea defences during maintenance has the potential to affect small fish prey availability in the water column supporting habitat. However, in accordance with the AoO, this pressure will be assessed as underwater sound given that sound is a combination of particle motion and pressure and most vibrations are a result of noise. Intertidal and subtidal sediment habitats are not affected by this pressure and saltmarsh habitats are not likely to be affected. Therefore, the vibration pressure has been screened out of any further assessment.		

Operation of coastal flood and erosion risk management schemes

Pressure Name (Red = medium to high risk White = low risk)	Bird																	Supporting habitat																	Activity-Pressure (AP) Notes	Screening	Screening notes
	Bar-tailed godwit, Non-breeding	Common tern, Breeding	Curlew, Non-breeding	Dark-bellied brent goose, Non-breeding	Dunlin, Non-breeding	Grey plover, Non-breeding	Little tern, Breeding	Pintail, Non-breeding	Red-breasted merganser, Non-breeding	Redshank, Non-breeding	Ringed plover, Non-breeding	Sanderling, Non-breeding	Sandwich tern, Breeding	Shelduck, Non-breeding	Shoveler, Non-breeding	Teal, Non-breeding	Turnstone, Non-breeding	Wigeon, Non-breeding	Freshwater and coastal grazing marsh	Salicornia and other annuals colonising mud and sand	Atlantic salt meadows	Spartina swards	Intertidal seagrass beds	Intertidal rock	Intertidal coarse sediment	Intertidal mixed sediments	Intertidal mud	Intertidal sand and muddy sand	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal mud	Subtidal sand	Water column				
Barrier to species movement	S		S	S	S	S	S	S		S	S	S		S	NS	S	S	S	S	S	S	S		NS		NS	NS	NS	NS	NS	NS	S	The pressure refers to obstructions to species movement caused by physical barrier or prolonged exposure to noise, light, visual disturbance or changes in water quality. The scale of the impact will depend on scale of activity and the location and will need to be considered on case-by-case basis to determine relevance to given feature/site. Coastal defences can also result in a barrier to species by restricting access to rivers/streams/estuaries or to species adapted to sea level rise and coastal change (Paganelli et al., 2013),(Defra and UK MMAS, 2010),(Govarets and Lauwaert, 2009). The noise and turbidity arising from dredging operations may pose a barrier to migration when occurring on or in proximity of specific migratory routes (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009),(Newell and Woodcock, 2013),(Henkel, 2006). Coastal development can result in barriers to species movement through increase noise (e.g. construction, shipping, acoustic deterrents), lighting, presence of structures, changes to water quality and suspended sediments (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(European Commission, 2011),(Hill, 1992),(Gill et al., 2001),(E&P Forum and UNEP, 1997),(UK Government, 2007),(European Commission, 2012),(Olesiuk et al., 2012).	Screened out	Medium-High risk pressure. However, once operational, the new coastal defences are unlikely to cause an alteration to migration flyways or local flight passes (e.g. between roosting and feeding habitat) of SPA/Ramsar birds as they will be in the same location as the existing defences and there will only be a small increase in the height of the sea wall relative to bird movements. 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 scheme 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. The potential barrier to bird movements due to noise associated with heavy machinery and/or piling for maintenance activities has been assessed separately under the 'maintenance of hard coastal defences' activity.		
Emergence regime changes, including tidal level change considerations	S		S	IE	S	S		S		S	S	S		S	IE	NS	S	IE		S	S	S	S	S	S	S	S	S	NS	S	S	NS	S	Coastal defence structures can result in changing coastal regime, and substantial schemes especially in estuaries could result in changes to tidal regime, and intertidal exposure, especially where associated with reclaim or dredging. Modification of the seabed morphology can also impact the water flow regime. Dredging activities can cause localised change to the hydrodynamic flow in an area. The magnitude of the effect will be related to the overall size (depth and area) of the excavation compared to the overall area of the system (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(Pontee et al., 2013),(Govarets and Lauwaert, 2009),(Adnitt et al., 2007),(Centre for Environment, 2011).	Screened out	Medium-High risk pressure but the proposed scheme does not involve dredging and it will not result in any changes to the tidal regime, water levels or the tidal prism within Langstone Harbour or Chichester Harbour.	
Physical loss due to coastal squeeze																				S	S	S	S	S	S	S	S						Coastal defence structures can result in loss of intertidal habitat due to coastal squeeze caused by sea level rise and hard structures preventing the roll back of habitats.	Screened in	This pressure is not listed within the AoO in the conservation advice package but has been included based on expert judgement and for completeness of the HRA. Loss of intertidal supporting habitats due to coastal squeeze 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 will be compensated for via the Solent and South Downs Habitat Compensation and Restoration Programme (HCRP).		
Water flow (tidal current) changes, including sediment transport considerations															IE					NS	NS	NS	S	S	NS	S	S	S	NS	NS	S	NS	S	Structures placed in the marine environment immediately interact with the local current regime. Structures added to the coastal environment as a result of coastal defence schemes, coastal developments, artificial reefs, etc., can change local flow conditions. In particular, cross-shore structures such as groynes and harbour arms can intercept flow paths, causing flows to divert around or across the structures (ABPmer, 2009),(ABPmer, 2010),(ABPmer, 2014),(Bradbury and Picklesley, 2013),(Bay., 2014),(Metoc Plc, 2010),(OSPAR Commission, 2008),(MeyGen Ltd., 2012). Coastal defence structures can result in changing coastal regime, and substantial schemes especially in estuaries could result in changes to tides/water flow, especially where associated with reclaim or dredging (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(Pontee et al., 2013),(Govarets and Lauwaert, 2009),(Adnitt et al., 2007).	Screened out	Medium-High risk pressure. However, no new cross-shore structures are proposed as part of the Scheme. The new defences will follow the existing alignment, albeit slightly seawards where encasement or sheet piles are required to ensure the stability of existing/new structures as part of the design.	
Wave exposure changes																			NS	NS	NS	NS	S	S	NS	NS	NS	NS	NS	NS	NS	S	Structures used in coastal defence can cause wave attenuation to the project frontage, changing wave height in the local area. This includes sheltering effects on the lee of structures and increased wave reflection effects (ABPmer, 2010). Some coastal defence structures are designed specifically for this purpose, resulting in changes to wave height and the operation of structures will maintain this change (Paganelli et al., 2013),(Rogers et al., 2010),(Defra and UK MMAS, 2010),(Pontee et al., 2013),(Govarets and Lauwaert, 2009),(Adnitt et al., 2007).	Screened out	Medium-High risk pressure but the proposed scheme will not result in any changes to the wave climate within Langstone Harbour or Chichester Harbour as the frontage is located in a sheltered, low wave climate area at the top of the harbours and there are no cross shore structures proposed as part of the scheme.		
Above water noise	S		S	S	S	S		S		S	S	S		S	S	S	S																Noise can arise from many activities in the marine environment. The use of machinery, vessels, explosives, people will result in an increase of above water noise. Some examples of sources of airborne noise are drilling rigs and support (E&P Forum and UNEP, 1997),(UK Government, 2007), vessels used to service aquaculture facilities (European Commission, 2012),(Olesiuk et al., 2012), vessels used in coastal developments and flood defences (Paganelli et al., 2013),(Rogers et al., 2010),(Bray, 2008),(Cutts et al., 2013),(OSPAR Commission, 2008),(Govarets and Lauwaert, 2009),(ICES (International Council for Exploration of the Sea), 2009), military activities, aggregate extraction (Thomsen and Intersessional correspondence group on underwater noise (2007 - 2009), 2009), cabling operations (Merck and Wasserthal, 2009),(Ware, 2009), pilling (INCA, 2004),(Joint Nature Conservation Committee (JNCC) and Natural England, 2011), etc. However, the magnitude of pressure would depend on the scale, intensity and duration of the activity.	Screened out	Low risk pressure. The new defences are not expected to significantly change the number, frequency or way in which people use the Langstone frontage compared to existing levels. The operation of the new sea defences will not involve the use of any vessels. Noise associated with heavy machinery and/or piling for maintenance activities has been assessed separately under the 'maintenance of hard coastal defences' activity.		
Abrasion/disturbance of the substrate on the surface of the seabed																			S	S	S	S	S	S	NS	S	S	S	S	S	S		The presence and operation of coastal flood defences can result in changes to sediment patterns with scour or erosion in some areas and siltation or accretion in others (Paganelli et al., 2013).	Screened out	Low risk pressure. There will be no direct abrasion or disturbance of SPA/Ramsar supporting habitats or functionally linked land during the operation of the proposed scheme. Potential for indirect effects from changes in water flows and scour/erosion or siltation/accretion has been assessed under the water flow changes and physical change to another sediment type pressures.		

[illegible]

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

Date: 14 October 2020
Our ref: DAS/13467/302123
Your ref: Langstone FCERM - Option Development



Ed Rowsell
Coastal Environmental Project Engineer
Eastern Solent Coastal Partnership

4th Floor
Eastleigh House
Upper Market
Street
Eastleigh
SO50 9YN

T 0300 060 3900

BY EMAIL ONLY

Dear Ed Rowsell

Discretionary Advice Service (Charged Advice)

DAS/13467/302123: Langstone Flood and Coastal Erosion Risk Management (FCERM) Scheme - Option Development

Thank you for your recent consultation regarding the above. This advice is being provided as part of Natural England's Discretionary Advice Service. The Eastern Solent Coastal Partnership (ESCP) has requested advice on the development of options of the Langstone FCERM scheme.

The advice contained within this letter is provided in accordance with the Quotation and Agreement dated 03 December 2019 and is based upon previous meetings, documentation and discussions with regards to the above scheme.

For the purpose of clarity, we have presented our advice separately below with respect to: (1) a chronology of Natural England's involvement in discussions and advice on the project to date; (2) Natural England's position on the accessible path against a solid encroachment on the Ship Inn to High Street frontage; (3) Natural England's position on the options for the Royal Oak frontage; (4) Natural England's advice under the Conservation of Habitats and Species Regulations 2017; and (5) Concluding remarks.

Brief Overview: The Langstone frontage in consideration for the Langstone Flood Coastal Erosion Risk Management Scheme covers approximately ~1Km and is located north on the mainland immediately north of Hayling Island.

It is important to note that the Langstone Village frontage of this particular area is covered by the following nationally and internationally important sites of nature conservation importance:

- Solent Maritime Special Area of Conservation (SAC)
- Chichester and Langstone Harbours Special Protection Area (SPA)
- Chichester and Langstone Harbours Wetland of International Importance under the Ramsar Convention (Ramsar Site)
- Chichester Harbour Site of Special Scientific Interest (SSSI)

The frontage east of Langstone Bridge is also within the Chichester Harbour Area of Outstanding Natural Beauty (AONB). We therefore advise that the Chichester Harbour Conservancy is involved in the scheme design for consideration.

(1) A chronology of Natural England's involvement in discussions and advice on the project to date

Please find a summary table below indicative of Natural England's involvement to date with the Langstone FCERM scheme and a summary of items below. Natural England involvement to date has been provided through the Discretionary advice service (DAS/13467/302123)

Item	Date	Natural England Involvement
A	23 August 2018	Pre-application for site meeting for design of new coastal defences to protect properties at Langstone Flood and Erosion Risk Management Scheme
B	21 November 2018	Rachel Jones (NE) provided advice at the Langstone Shortlist Workshop
C	10 May 2019	Rachel Jones (NE) attended Langstone Preferred Option workshop for Langstone Flood and erosion Risk Management Scheme
D	18 December 2019	Formal letter provided by Richard Morgan on potential environmental impacts on an alternative option of an offshore breakwater within Chichester harbour.
E	9 March 2020	Langstone Collaborative Stakeholder Workshop. In person attendance by Rachel Jones.
F	15 April 2020	Langstone Village FCERM Ecology and Heritage discussion via teleconference. Attendance by Simon Thompson (NE) providing advice and further correspondence by emails.

Summary of Natural England's Involvement

A – Langstone Initial Site Visit

Please find annexed Natural England's advice on the meeting notes of an initial site visit and our view on the accessible path approach

B – Langstone Shortlist Workshop

Please find annexed, the full formal Natural England advice to the proposed options presented at the time

C – Langstone Preferred Option Workshop

Please find annexed, the full formal Natural England advice to the proposed options presented at the time.

D – Alternative option of an offshore breakwater within Chichester harbour

The Eastern Solent Coastal Partnership (ESCP) had requested advice on the potential environmental impacts of an offshore breakwater option in Langstone Harbour. In summary, Natural England was not supportive of the alternative offshore breakwater option. The resulting environmental impacts would significantly undermine the Conservation Objectives of the national and international designated sites of Chichester Harbour, including, but not limited to; the significant permanent loss of approximately 6,800m² – 10,880m² of designated intertidal mudflats and sandflats, and saltmarsh habitats.

Please find annexed, the full formal Natural England response to this proposal.

E – Langstone Collaborative Stakeholder Workshop

Attended by Rachel Jones. A formal Natural England note was not issued after. Please see annexed Item E, further details from the email summarising Natural England's and other stakeholder comments taken directly from an ESCP email issued after the workshop.

F - Langstone Village FCERM Ecology and Heritage Discussion - Teleconference

This teleconference call provided an introduction to the scheme and current position, heritage considerations of alternative design options, and an update on the Royal Oak frontage.

The options available for the Ship Inn to High Street frontage including the leading accessible path option were discussed on the telephone call. Natural England did not have any significant concerns and queries to raise with the leading option for parapet wall on the top the existing quay wall for the Royal Oak frontage.

Natural England's advice can be found as set in the document provided in the Annex as the meeting note disseminated from ESCP. Further details of Natural England position on the leading options development for this options are set out in (2) and (3).

(2) Natural England's position on the accessible path option against a solid encroachment on the Ship Inn to High Street frontage

Ship Inn to High street frontage covers the following area: a vertical concrete blockwork wall located on the edge of the Ship Inn courtyard and approximately 40m in length. Access to the foreshore is at the north eastern end of the vertical wall. Immediately northwards is a concrete apron frontage of approximately 12 meters with gated access to the foreshore which ends at Langstone High street.

The current leading option is a setback floodwall (adjacent to the existing garden walls) with accessible path. As understood, material finishes will be determined at detailed design stage. Details of this option include;

- Setback reinforced floodwall adjacent to the existing garden walls, with accessible path to improve access to the existing footpath.
- Setback reinforced floodwall adjacent to the existing seawall at Green Cottage, with floodgate for access onto the accessible path.
- Floodproof existing wall at the Winkle Market with accessible path.

Discussion around the matters relating to the options can be found in the Annex.

Designated Sites

The setback reinforced flood wall at the Ship Inn to High street frontage sits directly behind the boundaries of the following national and international designated sites; Solent Maritime Special Area of Conservation (SAC), Chichester and Langstone Harbours Special Protection Area (SPA), Chichester and Langstone Harbours Wetland of International Importance under the Ramsar Convention (Ramsar Site) and Chichester Harbour Site of Special Scientific Interest (SSSI). Additionally the area lies within Chichester Harbour AONB. Further information on the conservation objectives of the designated sites is set out below.

The Solent Maritime SAC protects marine habitats and associated communities, including intertidal

mudflats and sandflats, and saltmarsh. The Conservation Objectives for the Solent Maritime SAC¹ are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and 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 the qualifying species;
- the structure and function (including typical species) of qualifying natural habitats;
- the structure and function of the habitats of the 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.

The Chichester and Langstone Harbours SPA and Ramsar Site protects overwintering and breeding bird species, together with the habitats that support them. The Conservation Objectives for the Chichester and Langstone Harbours SPA² are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and 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 populations of qualifying features; and
- the distribution of qualifying features within the site.

The supporting habitats of the SPA include the intertidal mudflats and sandflats, and saltmarsh habitats that are designated features of the Solent Maritime SAC.

The notified features of the Chichester Harbour SSSI include overwintering and breeding bird species, together with the intertidal mudflats and sandflats, and saltmarsh habitats that support them. The SSSI underpins the Solent Maritime SAC and Chichester and Langstone Harbours SPA.

Natural England's view

Natural England's preference for the flood coastal erosion risk management scheme would be the *least* environmentally damaging deliverable option in relation to the features of interest of the national and international designated sites. In all cases, the ecological significance of the impacts should be assessed in view of the site's conservation objectives provided in our formal Conservation Advice (<https://designatedsites.naturalengland.org.uk/>).

As discussed on the 15 April 2020 teleconference call, it is Natural England's understanding, that an alternative option to the accessible path is being considered. This would be to rebuild the existing brick footpath structure across a larger footprint in order to meet design and access requirements. Advice has therefore been sought on Natural England's position on the accessible path option against a solid

¹

<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030059&SiteName=solent&county=Southampton&responsiblePerson=&HasCA=1&NumMarineSeasonality=0&SiteNameDisplay=Solent%20Maritime%20SAC>

encroachment.

The solid encroachment option will lead to a permanent loss of designated sites including the Solent Maritime Special Area of Conservation, Chichester and Langstone Harbours Special Protection Area and Ramsar site and loss of Chichester Harbour Site of Special Scientific Interest.

It is Natural England's view that this loss, and all other matters capable of having a significant effect on designated sites in the Solent, must be addressed in the ways required by Regulation 63 of the Conservation of Habitats and Species Regulations 2017. Consideration will also need to be given to the obligations under the Wildlife and Countryside Act 1981 in relation to the Site of Special Scientific Interest.

It is Natural England's view that there is a likely significant effect on the European designated sites from this option. As you are aware, where there is a likelihood of significant effects (excluding any measures intended to avoid or reduce harmful effects on the European site), or there are uncertainties, a competent authority should fully assess (by way of an "appropriate assessment") the implications of the proposal in view of the conservation objectives for the European site(s) in question. Appropriate assessments cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned. Complete information is required to ensure that the proposal will not affect the integrity of the European sites. The Appropriate Assessment would need to assess the impact of the scheme on the conservation objectives of the designated sites. Each qualifying feature should be assessed in line with the maintain or restore conservation objectives.

If this assessment concludes that there is an adverse effect on integrity or uncertainty of an adverse effect on the qualifying features of the designated sites, the next stage is to consider if this can be addressed by conditions or other restrictions. If this is not possible, then alternative options that would have a lesser environmental impact should be considered. If there are no other deliverable alternative solutions the next stage is to consider imperative reasons of over-riding public interest. Further information on this process and these stringent tests is set in the Section 4 of this letter.

Given that the solid encroachment option will lead to a permanent loss of Annex 1 habitat – 'mudflats and sandflats not covered by seawater at low tide' a qualifying habitat for the Solent Maritime SAC and supporting habitat for the Chichester and Langstone Harbours SPA and Ramsar site, it is Natural England's view that this will have a more damaging impact on the features of interest at the designated sites, and is more likely to undermine the conservation objective of the designated sites, than the accessible path option. For the accessible path, the scale of the loss would be limited to the footprint of any timber piles, rather than the greater loss associated with a solid encroachment.

However, the potential shading from the accessible path on the intertidal habitat could still reduce the functionality of the SPA in line with the above conservation objectives and this matter would need to be fully considered as part of the Habitat Regulations Assessment. Furthermore, temporary effects during construction would also need to be assessed in the Habitats Regulations Assessment for both options.

However, on the basis of the information provided to date, it is Natural England's view that the current leading option of a setback floodwall with an accessible path option (for the Ship Inn to High Street frontage) is less damaging to the features of interest for the designated sites than the solid encroachment option. It is our view that this option would have a lesser effect on the designated sites and is the preferred option of the two.

If the solid encroachment option is progressed and the Habitat Regulations Assessment concludes that there is an adverse effect on integrity or uncertainty of an adverse effect on the qualifying features of the designated sites, this option would need to evidence that there are no less damaging alternative solutions that can be delivered for this frontage. Please note we have provided advice on earlier options and other alternatives on the 11 January 2019, Annexed Item B with reference to - "*ODU 3d Ship Inn*" and, provided that the accessible path option is deliverable, it is our advice that this would have a lesser effect on designated sites and is a less damaging alternative solution.

(3) Natural England's position on the options for the Royal Oak frontage

Overview of option:

Royal Oak frontage and footpath covers the following area; a frontage of approximately 100 metres including the Royal Oak public house, adjacent buildings and garden walls.

Due to public concerns, the current following options are currently being considered and investigated and are as follows;

- Current leading option; parapet wall on top of existing quay wall. This will require sensitive design, and possible lowering of sections in front of windows if technically possible (to be confirmed during detailed design),
- “Do Nothing” and isolate this area from the scheme altogether leaving it unprotected (though doing so may require additional floodgates elsewhere in the scheme), or
- Rebuild the existing quay wall at current height (but a handrail will likely be required), this would only provide erosion protection.

Designated Sites

The Royal Oak frontage is adjacent to the following national and international designated sites; Solent Maritime Special Area of Conservation (SAC), Chichester and Langstone Harbours Special Protection Area (SPA), Chichester and Langstone Harbours Wetland of International Importance under the Ramsar Convention (Ramsar Site) and Chichester Harbour Site of Special Scientific Interest (SSSI). Additionally the area lies within Chichester Harbour AONB. The immediate vicinity of the intertidal habitat at the Royal Oak frontage consists of Annex 1 habitat – ‘mudflats and sandflats not covered by seawater at low tide’ a qualifying habitat for the Solent Maritime SAC and supporting habitat for the Chichester and Langstone Harbour SPA.

Natural England notes that although the “Do nothing” option would be most beneficial for the environment, in terms of features of interest for the designated sites, this would however defeat the primary objectives for the Langstone FCERM scheme for those properties concerned.

Due to site constraints it is noted that the other leading options will be limited to the existing footprint of the current structure, with possible minor exceptions for underground services. It is also accepted that there will be temporary encroachment during construction. With this in mind, it is likely that the above leading options would have a limited permanent environmental impact on the features of interest for the designated site should there be careful consideration to the design and materials and the construction phase. As an example, the option of a parapet wall on top of the existing key wall will be on the current site fabric and there be no encroachment or loss of designated habitat, Annex 1 habitat – ‘mudflats and sandflats not covered by seawater at low tide’ habitat loss, of the SAC and supporting feature of the SPA.

Additionally, as the option is limited to the existing footprint, it is unlikely that there will be further impacts to the interest features of the site relating to additional pressures including, but not limited to; water flow (tidal current) changes, including sediment transport considerations impacts, encroachment on the intertidal habitat resulting in habitat loss, and a barrier to species movement.

However, consideration will need to be given to the impacts arising during the construction phase. Please also note previous advice delivered on the 11 January 2019, Annexed Item B with reference to - “*ODU 3k Royal Oak and footpath*”

As set out from the teleconferences and information to date, given that the current leading options at Royal Oak frontage are limited to the existing footprint and with careful design and construction, Natural England raises no significant concerns with regard to these options.

(4) Natural England's advice under the Conservation of Habitats and Species Regulations 2017 with regards to how Habitat Regulation Tests are applied.

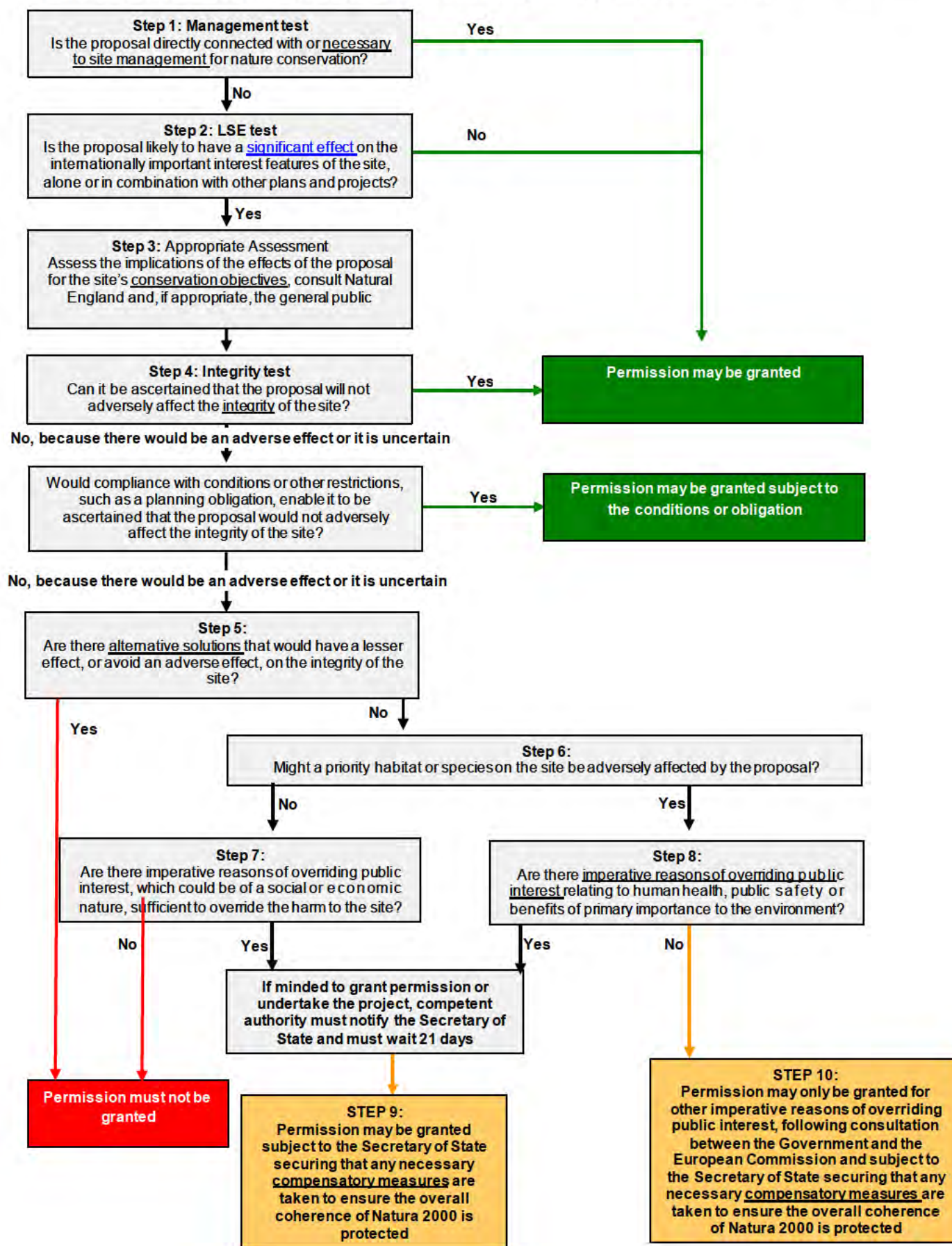
In accordance with the Conservation of Habitats and Species Regulations 2017, where there is likely to be a significant effect, either alone or in combination, on a European site, as a result of a new plan(s) or project(s) that are not considered to be directly connected with or necessary to the management of the site, competent authorities are required to make an Appropriate Assessment in view of that site's conservation objectives.

Conservation objectives for the above mentioned designated national and international sites can be found [here](#).

A key aspect of the Habitats Regulations is the duty placed on competent authorities to undertake a step by step process of screening for, assessing and (where necessary) compensating for the potential ecological implications of a new plan or project on a European Site, before deciding whether to give permission or authorization for that plan or project. This process is commonly referred to as the 'Habitats Regulations Assessment (HRA)' process.

In light of the conclusions of the assessment, (and subject to there being no alternative solutions and imperative reasons of overriding public interest (IROPI) why it should proceed,) they can only agree to the plan or project after having ascertained there will be no adverse effect on the integrity of the European site.

Figure 1: Step-wise consideration of plans/projects affecting European Sites by Competent Authorities under Regulations 63, 64 and 68 (after Tyldesley & Hoskin, 2008²)



Please find below a brief overview of the steps.

Step 1 - Is the Plan or Project Directly Connected to or Necessary for Site Management?

This should be interpreted as specifically meaning the management which is necessary for the conservation or restoration if appropriate of the site's European nature conservation features.

Step 2 – Assessment of ‘Likely Significant Effect’

This step requires the competent authority to initially assess the risk of a significant adverse effect associated with a new plan and project. A ‘likely significant’ effect (LSE) will be one that may reasonably be predicted as a consequence of a plan or project that might undermine the achievement of conservation objectives of the features for which the site is designated, but excluding trivial or inconsequential effects. Whilst not a statutory requirement, competent authorities are encouraged to seek the informal advice of Natural England early in the process when considering whether projects would be likely to have a significant effect on a European site. This is an opportunity for Natural England to provide scoping advice for the assessment and/or indicate any concerns. [Natural England's Discretionary Advice Service](#) is available to provide such advice. The assessment of projects (in view of the site's conservation objectives) should be done by the competent authority responsible for issuing a permission or consent or proposing to undertake a project directly. Those promoting a project must submit all relevant information to the competent authority which it may require to assess whether or not likely significant effects, either alone or in-combination, can be ruled out. Projects that are subject to the consent of a public body, and those which are to be carried out by a public body, even if no application for consent is required, e.g. because they are permitted developments, must be assessed under the Habitats Regulations.

An in-combination assessment is required where a plan or project may have an appreciable effect on a European site, but on its own the effect is not likely to be significant. The potential effects of the project should then be considered together, or in-combination, with other plans or projects that similarly may have an effect, but where on their own those effects are also not likely to be significant. The combined effects of two or more plans or projects may therefore become significant.

Where a competent authority concludes there would be no likelihood of a significant effect they should clearly record the reasons for the decision and good practice would be to advise Natural England. In that case, if all parties agree that there would be no likelihood of a significant effect, alone or in combination, there is no need for any further assessment unless the project is subsequently amended or any mitigation measures are not secured

Step 3 - The Appropriate Assessment (AA)

Any project that is not directly connected with or necessary to the management of the site and is likely to have a significant effect on a European site (or a significant effect cannot be ruled out) must be subject to an Appropriate Assessment (AA) made by the competent authority. This is the next step of the HRA process. The aim of the AA is to assess in greater detail each stage and element of the project and its potential impact on the integrity of the European site features, taking full account of the ecological needs of the features likely to be affected, the prevailing environmental conditions of the site at the time of the assessment and the formal conservation objectives for the site(s). The purpose of the appropriate assessment is to ascertain whether an adverse effect on site integrity can be clearly ruled out.

Neither the Habitats Directive nor the Habitats Regulations define a standard methodology for an AA, but it is taken to mean that the assessment must simply be appropriate to the project and its purpose under the Regulations (and also the Directive, which originated the use of the term). It does not necessarily mean that it has to be detailed and lengthy, but it should be as thorough and robust as possible in objectively addressing the likely effects on a site.

² Tyldesley, D. and Hoskin R. 2008 Assessing projects under the Habitats Directive: guidance for competent authorities. Report to the Countryside Council for Wales. Bangor.

The competent authority is responsible for completing the Appropriate Assessment and it must be undertaken and finalised before the competent authority considers giving the project its consent, permission or other authorisation.

Submission by the project proponent of alternative solutions and possible compensatory measures may be appropriate at this stage. They cannot be formally considered by the competent authority until the Appropriate Assessment stage has been completed but this does not prohibit informal discussions between the proponent, the competent authority and Natural England about these future steps where it is clear that these will need to be a consideration.

Natural England must be formally consulted on an Appropriate Assessment by a competent authority, who must then have regard to any representations it may make. The period allowed for Natural England to respond to any consultation on the Appropriate Assessment should be specified and be reasonable depending on the circumstances of the case. Natural England also acts as an informal 'adviser' to competent authorities in respect of the potential effects of projects on European sites in England. This is irrespective of where the projects are located. For example, projects in Scotland or Wales close to the English border may have an impact on sites within England. However, there is no statutory requirement for a competent authority to seek Natural England's opinion at the Likely Significant Effect (LSE) stage.

Some projects may also need an Environmental Impact Assessment (EIA) under the Regulations implementing the 1985 EIA Directive (as amended). Carrying out an EIA will usually be the role of a local planning authority.

Where a project subject to EIA would also be likely to have significant effects on a European site, the Appropriate Assessment must be carried out as well as undertaking the EIA. Usual practice is to embed the information to support the HRA in the Environmental Statement. Both HRA and EIA can be jointly co-ordinated where appropriate.

Step 4 - The Integrity Test

The competent authority must use the outcomes of the Appropriate Assessment (AA) to ascertain that the project will not have an adverse effect on the integrity of the site.

It is not for the competent authority to show that the proposal would harm the site in order to refuse to give its permission. It is for them to consider the likely and reasonably foreseeable effects and to ascertain that the proposal will not have an adverse effect on the integrity of the site before it may grant permission.

Integrity is considered at a site level and now forms the basis of Natural England's advice on European Site Conservation Objectives.

The integrity test embodies the **precautionary principle**, i.e. a competent authority must be certain that the project will not have an adverse effect on integrity before giving consent.

There are two possible outcomes to the determination of an adverse effect on integrity. It is vital to follow the way in which this test is worded in the Habitats Regulations because the wording encapsulates the precautionary principle.

- 1) It can be ascertained that the plan or project will not adversely affect the integrity of the European site, either with or without conditions or restrictions;
- 2) It cannot be ascertained that the plan or project will not adversely affect the integrity of the European site.

Step 5,6,7,8 - Alternative solutions and Imperative Reasons of Over-riding Public Interest (IROPI)

Projects likely to cause an adverse effect on site integrity can still proceed but are first subject to a series of additional tests and procedures for this, which are described as below. A key reference point regarding these steps is [Government guidance on alternative solutions, IROPI and compensatory measures](#) (published 2012). This is sometimes referred to as the 'Article 6(4) guidance' reflecting its origins in the Habitats Directive.

If a project is to proceed despite a negative assessment that an adverse effect on site integrity cannot be ruled out, the competent authority must first be satisfied that there are no alternative solutions that would have no adverse effects (or a lesser adverse effect) on the integrity of the site.

Alternative solutions are different ways of achieving the same objectives of the project, which would avoid adverse effects on the integrity of the site.

Alternative solutions may be more expensive, more difficult or less convenient to implement, but if the plan or project is still viable, then it is a realistic alternative. Unrealistic alternatives that cannot be achieved are not alternative solutions.

Natural England should be consulted on whether identifiable alternative solutions would avoid adverse effects on the integrity of the European Site(s). This may involve assessment of effects of the alternative solutions (alone or in-combination) on different interest features, or different European sites.

If there are no alternative solutions, the competent authority may consider whether the project falls within this IROPI definition and whether the importance of the project outweighs the harm it may cause to the European site. It should be noted that social and economic reasons do not apply if the project would adversely affect a SAC with priority habitats or species as listed on Annex I and II of the Habitats Directive.

Imperative Reasons of Overriding Public Interest (IROPI) means:

- Imperative - both necessary and urgent;
- Overriding - of such a scale of importance that the reasons outweigh the scale of harm to the integrity of the site;
- Public Interest – to achieve a public good rather than a private interest;

If minded to proceed with a project for imperative reasons of overriding public interest, a competent authority must notify the relevant UK Government department and wait 21 days before issuing its authorisation.

The decision as to whether to allow a project to proceed under the Habitats Regulations is, in effect therefore, a Government decision. The Government will scrutinise the availability of alternative solutions before assessing the case for imperative reasons of overriding public interest.

Dealing with 'priority natural habitats and species' as defined in the Habitats Directive

Where a plan or project is likely to have an adverse effect on a SAC priority natural habitat or species, as defined in Article 1 of the Directive, that plan or project can only be approved – notwithstanding an adverse effect - if there are imperative reasons of overriding public interest concerning human health and public safety or beneficial consequences of primary importance to the environment. In these circumstances, social and economic reasons do not constitute an imperative reason of overriding public interest. This reflects the stricter protection which the Habitats Regulations generally affords to these priority SAC features at this stage of the HRA process.

With regard to SPAs, the Wild Birds Directive does not identify any equivalent priority species of bird, and so social and economic reasons can be considered as IROPI.

Further information about the priority natural habitats and species outlined in the Habitats Directive can be found [here](#).

The terms '*human health*', '*public safety*' and '*beneficial consequences of primary importance to the environment*' are not defined in the Habitats Directive or Habitats Regulations but are considered by the European Commission to be the principal reasons for derogating from the legislation. A further opinion may be sought by Government from the European Commission. This option will no longer be available once the UK leaves the EU.

If the IROPI test is to apply, then proof must be provided and the need must relate to the timescales for implementation of the plan or project.

Steps 9 and 10 – Compensatory measures

Mitigation measures cover avoidance and reduction measures which may also result in no significant effect or no adverse effect on site integrity. These are different to **compensatory measures**. The former aim to reduce or avoid any potential adverse effects of new projects on European sites, whereas the latter are considered where there is still a net residual adverse effect after the Appropriate Assessment and Integrity Decision steps (i.e. despite the consideration of additional mitigation measures) and the competent authority is minded to consent the project given there may be no alternative solutions. Compensatory measures are intended to ensure that the ecological coherence of the wider European Site network is maintained if a European Site is adversely affected.

The competent authority must clearly distinguish between mitigation and compensatory measures in any assessment. They should be aware that the distinction may not be clear or correctly made in the details of the project.

It should be noted that it is only mitigation measures, and not compensatory measures, which should be taken into account, when considering the likelihood of a significant effect or an adverse effect on site integrity on the site.

Where a competent authority determines it necessary to proceed with the project notwithstanding an adverse effect, because there are no alternative solutions and there are imperative reasons of overriding public interest, all necessary compensatory measures must be secured and provided to the satisfaction of the Secretary of State. The project proponent should formulate, fund and deliver the compensatory measures, and the competent authority should satisfy itself as to the efficacy of the compensatory measures and ensure that they will be implemented.

In the above situation, the Government has to ensure that the coherence of the European Site network is secured. It is essential that compensatory measures are effective, comprehensive and put in place in time to provide fully the ecological functions for which they are intended to compensate. It is therefore important that project proponents and competent authorities consult Natural England on the compensatory measures as they evolve.

In general, compensation should be delivered before the adverse effect occurs so as to ensure that there is continuity of ecological function and the coherence of the European Site network is protected. However, in certain situations – perhaps because of the long time it would take to fully recreate a habitat – it may be acceptable to put in place measures which do not provide a complete functioning habitat. If this is the case, they should include provisions to ensure that the compensation will be secured within a given timeframe. In some circumstances, the affected habitat may be irreplaceable or impossible to recreate. In these cases, other forms of compensatory measures to maintain network coherence may be required. Where suitable compensatory measures cannot be secured, the plan or project may not be able to be authorised.

(5) Concluding Remarks

Natural England's current position on the leading options are based on the information provided through previous discussions, formal notes, correspondence and information presented at the time.

Natural England has reviewed the current leading options of the scheme in light of environmental considerations as requested. While the advice contained in this letter is based upon information provided at the time, it may be subject to further revision.

Careful consideration needs to be applied to the design, materials, temporary and permanent construction impacts to reduce any impact to features of interest to the designated sites.

It is feasible that the construction and maintenance of any new flood coastal erosion risk management options may create impacts upon species and habitats in addition to those protected by the SAC, SPA/Ramsar and SSSI designations. These include species protected under Schedule 5 of the Wildlife and Countryside Act (1981); and species and habitats of principal importance for the purpose of conserving biodiversity – identified under the Natural Environment and Rural Communities (NERC) Act (2006).

I trust that the above response is helpful and please feel free to contact me with any additional queries using the details provided below.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process. The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely Zara
Ziauddin

Marine Lead Adviser
Thames Solent Team

E-mail: [REDACTED]

Cc: commercialservices@naturalengland.org.uk

ANNEX

ITEM A

Emailed to Peter Scannell - Tue 21/08/2018 07:39

FAO – Peter Scannell

Your ref – Langstone Flood and Erosion Risk Management Scheme, Langstone Road, PO9 1RD

Our ref – 251217

Dear Peter,

Thank you for sending through the meeting notes. I have amended the notes below (see text in blue) and added comments with regard to the cantilevered boardwalk approach.

Please let me know if you have any queries or need any further information.

The advice provided in this email has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Kind regards

Rachel

Rachel Jones
Lead Advisor Sustainable Development
Dorset, Hampshire and Isle of Wight Area Team

From: Scannell, Peter [REDACTED]
Sent: 31 July 2018 08:25
To: Jones, Rachel 2 (NE) <[REDACTED]>
Cc: Rowsell, Ed <[REDACTED]>
Subject: Fw: Langstone scheme site walkover notes

Hi Rachel,

Following an internal meeting Ed and I attended yesterday, I have a query on Langstone that I hope you can add to the other points in my previous email. We briefly asked this on site but a more formal NE view will be important in considerations.

What is NE's view on a cantilevered boardwalk approach expanding the width of the path without any direct or permanent loss of designated site. It would require consideration of the effect of shadowing on site features, that it could be considered there is no loss of habitat. It could be considered that it constitutes temporary and reversible loss and therefore avoids the implications of the recent MMO position paper on loss of designated site.

Regards,

Peter

From: Scannell, Peter

Sent: 24 July 2018 10:06

To: [REDACTED]

Cc: Rowsell, Ed

Subject: Langstone scheme site walkover notes

Hi Rachel,

Following the site walkover last week at Langstone I have collated the points discussed with NE during the walkover below. As discussed please feel free to add/ amend these if you feel they do not reflect what was discussed.

Natural England would be looking for the option that is 'least damaging' [and to secure net biodiversity gain over and above any residual losses](#).

Encroachment into SPA/SAC- discussion around need for any encroachment to go through derogation (IROPI case). [Natural England is aware of the MMO's revised interpretation of the *Sweetman* Judgment \(handed down in April 2013\)](#). The MMO is taking a very robust approach [in relation to small-scale, permanent loss of SAC habitat](#), with limited potential for the 'de minimis' approach.

[It is Natural England's advice that this position is recognised at the early stage of the project design and discussions are held with the MMO at the earliest opportunity.](#)

[It is Natural England's view that the design options for the project should focus on the likely impacts on the designated sites and assessing their ecological significance in view of the site's conservation objectives provided in our formal Conservation Advice.](#)

[The MMO's current position is that any permanent habitat loss](#) would have to be able to fulfil the derogation approach e.g. be the only satisfactory option (technical and economic feasibility), be for reasons of over-riding public interest and be fully compensated. It was noted that this is likely to be picked up by the RHCP, we are developing this approach for the Gosport Priority Scheme at present. It was also noted that encroachment for improvement of public realm/placemaking is unlikely to be compliant with the derogation approach.

Habitat creation balance sheet- Opportunities to create replacement intertidal habitat elsewhere within the scheme area could be limited but should be explored once the Phase 1 Habitat Survey/ Preliminary Ecological Appraisal has been undertaken. There is an inlet to the west of Langstone Sailing Club and to the east of the spit which is currently not part of the designated sites. It was noted that there may be potential for claiming this as habitat creation as it is not within the current SAC boundary. However, Natural England suggested this [was dependant on the nature of the existing habitat present in this area subject to ecological survey](#). [If the habitat is already supporting habitat, such as saltmarsh, this could not be claimed as habitat creation](#). We advise that [opportunities for biodiversity enhancements are fully explored within the scheme area](#).

Timing of works- particularly tricky on this site due to over-wintering and breeding interest in close proximity to site, but it will depend on the final design how impactful it may be and therefore what restrictions may be required.

What is NE's view on a cantilevered boardwalk approach expanding the width of the path without any direct or permanent loss of designated site? It would require consideration of the effect of shadowing on site features, that it could be considered there is no loss of habitat. It could be considered that it constitutes temporary and reversible loss and therefore avoids the implications of the recent MMO position paper on loss of designated site.

NE's view

We agree that, from the information given, the likely impacts from the cantilevered boardwalk would be shadowing rather than permanent habitat loss. The impact of the shadowing would need to be assessed for its ecological significance in view of the site's conservation objectives and this assessment would determine the suitability of this approach.

It is our view that for the boardwalk to be classified as temporary, it will be necessary for there to be a clear end-date to the project at which point a permission would expire; a detailed statement which provides for and outlines the implementation of the removal of the temporary feature/effect, and a clear method statement as to the restoration of the affected feature back to its former condition. The removal of the project/effect and its remediation would have to be fully enforceable.

Regards,

Peter Scannell
Coastal Project Engineer

ITEM B

Emailed to Adam Sennitt - Fri 11/01/2019 12:35

FAO – Adam Sennitt
Your ref – Langstone Shortlist Workshop
Our ref – 261874

Dear Adam,

Thank you for consulting Natural England on the proposed short-listed options for the Langstone FCERM. Please find our comments on the scheme below.

As you know, the Langstone FCERM frontage will require detailed consideration of the following designated sites: Solent Maritime Special Area of Conservation, Chichester and Langstone Harbours Special Protection Area and Ramsar site, Chichester Harbour Site of Special Scientific Interest and the Langstone Harbour Site of Special Scientific Interest.

The frontage east of Langstone Bridge is also within the Chichester Harbour Area of Outstanding Beauty. We therefore advise that the Chichester Harbour Conservancy is involved in the scheme design in due course.

ODU 1: Langstone West, between the east bank of the Langbrook Stream to the edge of the formal defences at the northern end of Langstone Spit

ODU 1a – Langbrook Stream east bank

The scoped in measures at this location include setback floodwall and earth embankment. Both options are outside of the designated sites. We advise that a detailed ecological appraisal of these options is undertaken to avoid ecological impacts wherever possible. If avoidance is not possible, detailed consideration should be given to mitigation measures, supported by significant ecological enhancements.

It is unclear whether there is potential for any loss of designated site in the southern section of the area due to the necessary tie-in with existing defences. This may require further consideration in the detailed analysis.

ODU 1b – Formal defences protecting west Langstone

The options considered include crest raising (and wall refurbishment), seawall and sheet piling. Our preferred option is for the new defences to be set back and outside of the designated sites rather than encroachment, especially given the availability of land behind the existing defences. Set-back sheet piling is therefore preferred. Crest raising and wall refurbishment is an alternative option, depending on the scale of the work required and the impact on designated sites.

Potential impacts during construction will also need to be included in the analysis especially with respect to the timing of the works - the over-wintering birds and the breeding terns at the Oysterbeds in the summer.

ODU 2 Sailing club and Langstone Spit, including the spit, sailing club and A3023 revetment

ODU 2a Langstone Spit

Natural England's preferred approach is no active intervention to allow natural coastal processes to evolve. It is noted that the spit is showing very slow signs of erosion with greatest risk at the very southern tip. Any changes to the spit could impact on wider coastal processes in the area and detailed modelling would be required. Natural England has serious concerns about the sustainability of a formal defence scheme at this location and the associated impacts on the natural environment with respect to loss of intertidal habitat.

Any proposed scheme would need to fully meet the requirements of the Habitats Regulations Assessment. It is likely that formal defence schemes along the spit will lead to a loss of intertidal habitat within designated sites with the potential for an adverse effect on the integrity of the site. As such, detailed consideration will need to be given to alternative options to identify if there is a less environmentally damaging option that is feasible. It is Natural England's view that ODU 2b offers a more acceptable alternative option to safeguarding residential properties in the local area.

It is noted that ODU 2b does not address the potential long term risk to the sailing club. To meet the tests of the Habitats Regulations, all feasible alternative options with regard to the layout, design and location of the sailing club will need to be considered in the first instance. It will also be necessary to set out the imperative reasons of over-riding public interest (IROPI) for the proposed scheme. It is Natural England's view that this stringent test will be very difficult in this instance, if the chosen flood defence scheme is needed solely for the sailing club.

ODU 2b National Cycle Route 2 path

Natural England supports the options for a set back floodwall or earth embankment along this frontage, both of which run inland and will not impact on the designated sites.

ODU 2c Sailing Club

Both options – setback floodwall and revetment – will require a detailed Habitat Regulations Assessment. Encroachment into the designated sites could potentially have an adverse effect on the integrity. As such, detailed consideration will need to be given to alternative options that are less-environmentally damaging. It is Natural England's view that this should include the option of consolidating / reconfiguring the land use at the sailing club and consider alternative locations for the sailing club. The comments set out in ODU 2a are relevant.

ODU 3 Langstone east, between the Ship Inn car park and the Old Mill slipway

ODU 3a Slipway (south of Ship Inn car park)

ODU 3b Ship Inn car park

The proposed options are all set back and outside of the designated sites and this approach is supported.

ODU 3c Slipway (north of Ship Inn car park)

Natural England supports the flip-up floodwall, demountable defences and flood gate at the top of the slipway. These options are all outside of the designated sites.

Natural England does not support the proposed sea wall across the bottom of the slipway, which is proposed primarily for public open space. The lower section of the slipway is within the designated sites and encroachment into the designated sites could potentially have an adverse effect on the integrity of the site. The Habitats Regulations Assessment will need to include a detailed consideration of alternative options as well as imperative reasons of over-riding public interest.

A full assessment of less environmentally damaging alternatives will need to be undertaken including alternative locations for the seawall as well as the redesign of the car park to achieve public open space opportunities etc. It will also be necessary to set out the imperative reasons of over-riding public interest (IORPI) for the proposed option if this scheme is progressed. It is Natural England's view that it will be very difficult to justify the IROPI need for these opportunities in this location.

ODU 3d Ship Inn

Natural England's preferred options are setback flip-up floodwall and demountable defences, rather than a glass topped floodwall. The latter option will potentially lead to encroachment into the designated sites, therefore detailed consideration will need to be given to alternative options before this scheme is progressed.

ODU 3e Fenced area adjacent to Ship Inn

All proposed options are set back from the frontage and this approach is supported.

ODU 3f Coastal footpath and ODU 3h Coastal footpath

Natural England's preferred option is to reinforce / replace de-facto defences (garden wall) as this is a less environmental damaging option. The alternative option proposed – setback floodwall and boardwalk – will lead to potential impacts on the designated sites due to shading and this will need to be examined in detail in the Habitats Regulations Assessment.

Natural England strongly advises that the assessment considers all potential alternative options including alternative strategic options as well as scheme proposals. For example, consideration will need to be given to re-routing the footpath away from the frontage if there is no space for both a footpath and seawall, as well as the

option of setting the new flood defence further back into the gardens etc. Alternative widths of the footpath will need to be considered. Although the SMP has determined a Hold the Line Policy in this location, this has been for flood defence structures to be placed here, not for additional structures that are required for the footpath, which may impact on the designated sites. It is therefore particularly important alternative options are considered.

ODU 3g Private Green / grassed area in front of heritage buildings

Natural England's preferred options are the flip-up floodwall and demountable defences. The other options will lead to potential impacts on the designated sites. Detailed consideration will need to be given to the alternative options available, as set out above (ODU 3f and ODU 3h). The option of having the footpath and boardwalk moved back into the grassed area needs detailed consideration in the alternatives assessment as this is likely to be the least damaging option with respect to the designated sites. If an alternative approach is taken for heritage reasons, a full justification explaining why this is needed will be required setting out the full explanation of the imperative reasons of over-riding public interest.

ODU 3i Coastal footpath immediately in front of residential building

Natural England's preferred option is demountable defences and to flood-proof the building. The other option will lead to potential impacts on the designated sites. Detailed consideration will need to be given to the alternative options available, as set out above (ODU 3f and ODU 3h).

ODU 3j Slipway at Langstone High Street

Natural England raises no concerns about the options at this location.

ODU 3k Royal Oak and footpath

Natural England's preferred options are the flip-up floodwall and to reinforce / replace de-facto defences and flood proof building.

ODU 3l Potential tie-in location to high ground.

The scoped in measures at this location include setback floodwall and earth embankment which are outside of the designated sites. We advise that a detailed ecological appraisal is undertaken to avoid ecological impacts wherever possible. If avoidance is not possible, detailed consideration should be given to mitigation measures, supported by significant ecological enhancements. Consideration will need to be given to the ecological sensitivities of the Mill pond during construction works, as well as the designated sites.

ODU 4: Old Mill and Mill pond, between the Old Mill slipway and the slipway to the north east of the Mill pond

ODU 4a Mill

Natural England's preferred option is for demountable defences that are setback as well as PLP / PLR. These options avoid impacts to the designated sites.

ODU 4b Footpath

Our preferred option is for a setback floodwall to avoid impacts to the designated sites. Detailed consideration will need to be given to the sensitivities of the ecological interests in Mill Pond as well as the designated sites during the construction of any scheme.

I hope the above is helpful with regard to the detailed analysis. Where there is the potential for encroachment into the designated sites, a full explanation and justification of alternative options will be required to meet the tests of the Habitats Regulations. This will need to include strategic options as well as different scheme designs. We appreciate the complexity of the issues at the site, especially the heritage and landscape considerations. However, where the scheme options will impact on the designated sites, a full consideration of alternatives will be necessary with detailed justification to meet the tests of the Habitats Regulations. This should also include the Do nothing and Do minimal options. We would be happy to discuss any queries in due course, especially as the design options progress.

The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Kind regards
Rachel

Rachel Jones
Lead Advisor Sustainable Development
Dorset, Hampshire and Isle of Wight Area Team

ITEM C

Emailed to Adam Sennitt - Wed 17/07/2019 11:04

FAO – Adam Sennitt

Your ref – DAS Pre-application: (Meeting 10th May) Langstone Preferred Option workshop for Langstone Flood and Erosion Risk Management Scheme, Langstone Road, PO9 1RD
Our ref – 281713

Dear Adam,

Thank you for inviting Natural England to the Langstone Preferred Options workshop. ESCP has requested further views on the options being considered. I apologise for the delay.

Natural England has provided advice (attached) on our preferred options for the whole stretch and this advice still stands.

Further advice has been provided below in relation to ODU 3 Langstone east, between the Ship Inn car park and the Old Mill slipway as the options currently being considered will lead to direct and indirect effects on the designated sites including the Solent Maritime Special Area of Conservation, Chichester and Langstone Harbours Special Protection Area and Ramsar site and the Chichester Harbour Site of Special Scientific Interest.

It is also noted from the workshop that the option currently being considered for ODU1b will potentially lead to a loss of designated site. As you know, our preferred option for this stretch is for the new defences to be set back and outside of the designated sites rather than encroachment, especially given the availability of land behind the existing defences.

However, we have not provided further comments on the proposal at this stage as it was noted at the meeting that the funding arrangement for this stretch is uncertain and this stretch is unlikely to form part of the scheme going forward. If this situation changes, please let Natural England know at the earliest opportunity in order that we can provide additional advice.

ODU 3 Langstone east, between the Ship Inn car park and the Old Mill slipway

Further advice has been provided on the proposed scheme from **ODU 3f to ODU 3i**.

Natural England's preferred option is to reinforce / replace de-facto defences (garden wall) as this is a

less environmental damaging option. It is noted that the proposed scheme option going forward due to feasibility and technical reasons is the set back flood wall and boardwalk.

As noted in our earlier advice, the Habitats Regulations Assessment will need to consider all potential alternative options including alternative strategic options as well as scheme proposals. For example, consideration will need to be given to re-routing the footpath away from the frontage if there is no space for both a footpath and seawall, as well as the option of setting the new flood defence further back into the gardens etc. Alternative widths of the footpath will need to be considered.

Although the SMP has determined a Hold the Line Policy in this location, this has been for flood defence structures to be placed here, not for additional structures that are required for the footpath, which may impact on the designated sites. It is therefore particularly important that alternative options are considered and it is Natural England's preference that impacts to designated sites are avoided in the first instance and then minimised.

With regard to section ODU 3g, the option of having the footpath and boardwalk moved back into the grassed area should be considered as this is likely to be the least damaging option with respect to the designated sites. If an alternative approach is taken for heritage reasons, a full justification explaining why this is needed will be required setting out the full explanation of the imperative reasons of overriding public interest.

The proposed set back flood wall and boardwalk will potentially have direct and indirect impacts on the designated sites and will require detailed consideration in line with the relevant legislation and supplementary advice that is available.

It is our understanding that the boardwalk will extend across the designated sites, leading to shading. In addition, it is unclear at this stage whether there will be direct loss of designated sites from any supports. Consideration will need to be given to the potential direct and indirect effects on the interests of each designated site (SAC, SPA, Ramsar and SSSI).

With regard to the SPA, it is Natural England's view that shading is likely to lead to the loss of function of SPA supporting habitat around the boardwalk. Therefore consideration will need to be given to the direct loss of this supporting habitat and its impact on qualifying features associated with the construction and operation of the boardwalk, as well as indirect effects on adjacent habitats during these works. Consideration should also be given to any temporary or permanent increase in disturbance to birds that may result from construction and operation.

With regard to the direct and indirect effects on the boardwalk on the SAC, it is noted that a phase 2 intertidal habitat survey will be undertaken in due course. This survey will be useful to assist with the classification of the habitats in accordance with the designated site sub features.

The assessment will need to identify the direct and indirect effects on the feature (estuaries) and sub-features (intertidal coarse sediments, mixed sediments and mud) of the Solent Maritime Special Area of Conservation from the proposal. The details provided to date show that intertidal shingle (LS6) and intertidal mud (LS4) will be overshadowed. The impacts of this overshadowing will be determined by the type and sensitivity of biotopes present. We recommend that the phase 2 intertidal habitat survey is used to inform this assessment, and that post-construction monitoring is also conducted to characterise any resultant changes to characterising species.

ODU 3k Royal Oak and footpath

Natural England's preferred options are the flip-up floodwall and to reinforce / replace de-facto defences and flood proof building.

It is understood that this scheme is not being progressed due to technical reasons and the proposed option being considered will lead to encroachment into the designated sites. This will lead to the direct loss of designated site for the SAC, SPA, Ramsar site and SSSI and the potential for indirect effects

that will require detailed examination.

The Habitats Regulations Assessment will need to set out the assessment of the alternatives for the scheme. It is Natural England's preference that effects are avoided in the first instance. Where this is not possible, consideration should be given to mitigation measures and then compensation.

We advise that the phase 2 habitat survey is used to identify that direct and indirect effects on the feature (estuaries) and sub-features (intertidal coarse sediments, mixed sediments and mud) of the Solent Maritime Special Area of Conservation from the proposal.

It is understood that the access to the Mill House is across the intertidal habitat and within the designated site and this route may have been reinforced. We advise that the phase 2 intertidal habitat assesses this in detail. The direct and indirect effects of any change to the access route as a result of the scheme will need to be considered in detail.

With regard to the SPA, it is noted that brent geese, dunlin, redshank and black-tailed godwit are the main species seen in proximity to the scheme, and in some circumstances will feed close to the scheme boundary in small numbers. The direct loss of SPA supporting habitat and its associated effect on qualifying species will need to be considered as the scheme design evolves. It is our preference that these effects are avoided in the first instance and then minimised with mitigation and then consideration of compensation. Once the residual effects have been addressed, consideration should be given to environmental enhancements.

We would be happy to provide further information as the scheme progresses. Please let me know if you need any further information.

The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Kind regards
Rachel

Rachel Jones
Lead Advisor Sustainable Development
Dorset, Hampshire and Isle of Wight Area Team

ITEM D

Date: 18 December 2019
Our ref: DAS/13467/302123
Your ref: Langstone FCERM Scheme – Offshore Breakwater



Hilary Crane
Coastal Environmental Project Engineer
Eastern Solent Coastal Partnership

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

BY EMAIL ONLY

0300 060 3900

Dear Hilary

Discretionary Advice Service (Charged Advice) DAS/13467/302123: Langstone Flood and Coastal Erosion Risk Management (FCERM) Scheme: Offshore Breakwater Option

Thank you for your recent consultation regarding the above, which was received on 29 November 2019.

This advice is being provided as part of Natural England's Discretionary Advice Service. The Eastern Solent Coastal Partnership (ESCP) has requested advice on the potential environmental impacts of an offshore breakwater option in Langstone Harbour.

The advice contained within this letter is provided in accordance with the Quotation and Agreement dated 03 December 2019 and is based upon the following documents:

- Technical Note: Langstone FCERM Scheme – Further appraisal of offshore breakwater option (Ref. 60578525)

For the purpose of clarity, we have presented our advice separately below with respect to: (1) an overview of the offshore breakwater option; (2) potential environmental impacts arising from its construction and operation; and (3) Natural England's advice under the Conservation of Habitats and Species Regulations 2017.

1. Overview of the offshore breakwater option

The Portchester to Emsworth Flood and Coastal Erosion Risk Management Strategy (PEMS) adopted by Havant Borough Council (HBC) in 2012, recognises the need to reduce flood risk at Langstone, and sets out long term recommendations for managing the frontage. We understand that the ESCP is seeking to progress these recommendations and deliver a scheme at Langstone which reduces the flood risk to the village and the A3023 by increasing the Standard of Protection (SoP) of the defences to the east and to the west of the village. Following a robust appraisal process, the preferred option for the frontage is to increase the SoP using a combination of raised walls, flip-up barriers and flood gates. Natural England has provided previous advice on options for the Langstone scheme, however, we

understand that the ESCP has been asked by local residents to revisit the alternative option of an offshore breakwater within Chichester Harbour.

As outlined in the Technical Note, the key features of the proposed breakwater include the following:

- To create a line of defence at a point where the storm issues can be separated from the tide issues.
- Build the defence on the hypotenuse of the triangle between the road embankment at the north of the A3023 bridge to a point to the east of the Old Mill.
- Create a harbour wall using boulders and create an inner harbour where the water level can be managed. The wall could follow an arc shape to deflect wave forces away from the Langstone area.
- Locate the breakwater 'some' distance away from habitation where its visual impact is lessened.
- Build the breakwater progressively over a 100-150 year period according to actual requirements.

2. Potential environmental impacts arising from construction and operation

In assessing the potential environmental impacts of an offshore breakwater option, we have used the information provided in the Technical Note to inform our understanding. It is acknowledged that this information relates to a feasible outline design rather than a finalised plan, and as such may be subject to further revision. However, we envisage that the key principles outlined below would remain applicable to alternative offshore breakwater designs within Chichester Harbour.

It is important to note that Chichester Harbour, including the area encompassing a potential offshore breakwater, is covered by the following nationally and internationally important sites of nature conservation importance:

- Solent Maritime Special Area of Conservation (SAC)
- Chichester and Langstone Harbours Special Protection Area (SPA)
- Chichester and Langstone Harbours Wetland of International Importance under the Ramsar Convention (Ramsar Site)
- Chichester Harbour Site of Special Scientific Interest (SSSI)

As such, it is Natural England's view that the construction and presence of an offshore breakwater in the harbour has the potential to result in a number of significant environmental impacts. These impacts include the following:

i) Impacts upon the Solent Maritime SAC

The Solent Maritime SAC protects a marine habitats and associated communities in this location, including intertidal mudflats and sandflats, and saltmarsh. The Conservation Objectives for the Solent Maritime SAC² are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:

²

<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030059&SiteName=solent&county=Hampshire&responsiblePerson=&HasCA=1&NumMarineSeasonality=0&SiteNameDisplay=Solent%20Maritime%20SAC>

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

Based on the information provided in the Technical Note, the construction of an offshore breakwater would undermine these Conservation Objectives by resulting in the significant permanent loss of approximately 6,800m³ – 10,880m² of designated intertidal mudflats and sandflats, and saltmarsh habitats, as a direct result of smothering from the footprint of the breakwater alone. It is also envisaged that additional permanent habitat loss could result from the maintenance of the breakwater structure over the duration of its lifespan.

In addition to the direct loss of designated habitat resulting from construction/maintenance, the presence of a breakwater structure will have significant effects upon natural coastal processes within Chichester Harbour. Such effects include changes to the tidal regime (range, currents and circulation patterns) and estuarine morphology. Furthermore, the displaced energy of any waves hitting the breakwater could increase rates of erosion either side of the structure, exacerbating issues further. It is envisaged that as a result, the large intertidal area landward (and possibly seaward) of the breakwater will become modified to such an extent that it will adversely affect the structure and function of the habitats present. It should also be noted that 'Estuaries' are a designated feature of the Solent Maritime SAC, which places specific emphasis upon maintaining natural processes.

ii) Impacts upon the Chichester and Langstone Harbours SPA and Ramsar Site

The Chichester and Langstone Harbours SPA and Ramsar Site protects overwintering and breeding bird species, together with the habitats that support them. The Conservation Objectives for the Chichester and Langstone Harbours SPA² are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and 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 populations of qualifying features; and
- the distribution of qualifying features within the site.

The supporting habitats of the SPA include the intertidal mudflats and sandflats, and saltmarsh habitats that are designated features of the Solent Maritime SAC. Therefore, the construction/maintenance and presence of an offshore breakwater would undermine the Conservation Objectives of this site due to the significant loss and modification of supporting habitats for protected bird species – via the pathways

³

<https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9011011&HasCA=1&NumMarineSeasonality=18&SiteNameDisplay=Chichester%20and%20Langstone%20Harbours%20SPA>

detailed above.

Furthermore, it is Natural England's view that due to its size and approximate location, the construction and maintenance of an offshore breakwater in Chichester Harbour has the potential to create significant disturbance impacts upon overwintering and breeding birds. It may be possible to mitigate such impacts by avoiding noisy works during sensitive periods, although this is likely to have implications for the construction timescale.

iii) Impacts upon the Chichester Harbour SSSI

The notified features of the Chichester Harbour SSSI include overwintering and breeding bird species, together with the intertidal mudflats and sandflats, and saltmarsh habitats that support them. As this SSSI underpins the Solent Maritime SAC and Chichester and Langstone Harbours SPA, the impacts upon its features remain consistent with these sites.

iv) Impacts upon other species and habitats of conservation importance

It is feasible that the construction, maintenance and presence of an offshore breakwater in Chichester Harbour may create impacts upon species and habitats in addition to those protected by the SAC, SPA/Ramsar and SSSI designations. These include species protected under Schedule 5 of the Wildlife and Countryside Act (1981); and species and habitats of principal importance for the purpose of conserving biodiversity – identified under the Natural Environment and Rural Communities (NERC) Act (2006).

3. Advice under the Conservation of Habitats and Species Regulations 2017

In light of the anticipated environmental impacts outlined in section-2, it is Natural England's view that should this offshore breakwater option be subject to a Habitats Regulations Assessment (HRA), the extent and magnitude of the direct and indirect habitat losses as a result of the development would result in an adverse effect on the integrity of the Solent Maritime SAC and the Chichester and Langstone Harbours SPA and Ramsar Site. For the project to proceed, it will be necessary to satisfy the derogation tests required under Article 6(4) of the Habitats Directive and Regulation 64 of the Conservation of Habitats and Species Regulations 2017 (the Regulations); namely the consideration of 'alternative solutions', followed by the consideration of imperative reasons of overriding public interest (IROPI). Where it is agreed that a potentially damaging plan or project can go ahead for imperative reasons of overriding public interest, Article 6(4) of the Habitats Directive and Regulation 68 of the Regulations require that all necessary compensation measures are taken to ensure the overall coherence of Natura 2000 is protected⁴.

While the determination of alternative solutions and IROPI lies with the Secretary of State for Environmental, Food and Rural Affairs, it is Natural England's view that it would be difficult for an offshore breakwater option to satisfy these derogation tests. Principally, the purpose of the alternative solutions test is '...to determine whether there are any other feasible ways to deliver the overall objective of the plan or project which will be less damaging to the integrity of the European site(s) affected'⁵. On this point, we note that alternative less damaging options have already been identified by the ESCP with respect to using a combination of raised walls, flip-up barriers and flood gates.

4. Concluding remarks

Natural England has reviewed the potential environmental impacts of an offshore breakwater option in Chichester Harbour, as requested. While the advice contained in this letter is based upon an outline design which may be subject to further revision, it is Natural England's view that the construction,

⁴ https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/new_guidance_art6_4_en.pdf

⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69622/pb13840-habitatsiropi-guide-20121211.pdf

operation and maintenance of a breakwater structure in the harbour will result in a number of adverse effects upon designated sites. On this basis, Natural England would not support the option of an offshore breakwater and encourages the ESCP to continue pursuing alternative less damaging solutions.

I trust that the above response is helpful and please feel free to contact me with any additional queries using the details provided below.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely

Richard Morgan
Marine Lead Adviser
Thames Solent Team
E-mail: [REDACTED]
[REDACTED]

ITEM E

From: Box, Samantha [REDACTED]

Sent: 19 May 2020 16:23

Subject: LANGSTONE FCERM STUDY - Workshop Report & Public Engagement Report now online

LANGSTONE FLOOD AND COASTAL EROSION RISK MANAGEMENT STUDY

Dear all,

On behalf of the Langstone Study team we all hope you are keeping safe and well during these strange times.

As promised, we have put together a Workshop Report as a record of the Collaborative Workshop held with the community in March 2020.

You can view this report and the presentations given at the workshop, as well as a write up of the public events held in January 2020, on the project webpages:

<https://www.escp.org.uk/langstone>

<https://www.escp.org.uk/Engagement>

Following on from the workshop, the project team have been working hard to actively address some of the main points raised by you, particularly in relation to the boardwalk and the floodwall around the Royal Oak frontage.

To keep you all up to date, I'd like to share with you how we acted on the inputs we received through the discussions:

Floodwall and Boardwalk (between the Ship and Langstone High Street)

You said ...

There were concerns over the visual impact of a boardwalk on heritage value. Maintaining access over the footpath was important to you and most agreed a footpath was needed and talked about widening the existing footpath. You also talked about reinforcing the existing wall as the flood defence.

We did ...

We met with Natural England, the Local Planning Authority and the Havant Borough Council (HBC) Conservation Officer in late April 2020 to discuss the feedback we received and to seek further opinion on the most appropriate option to take forward along this frontage based on our need to find the right balance between the heritage impact, planning and environmental implications.

The boardwalk option (1) was discussed along with other alternatives: (2) rebuilding the existing footpath on a wider footprint (to comply with Health and Safety (H&S) legislation this is likely to also include a handrail); (3) abandon the current footpath and re-route inland.

It was recognised by all that heritage will be impacted whatever the option, it's the balancing between heritage impacts, environmental harm and public benefit that will be important.

Consensus was that a no path option is not acceptable.

A structure with a wider footprint would require encroachment into the highly designated foreshore and therefore is not preferable on environmental grounds (which in this location would not be outweighed by heritage concerns) and all stakeholders agreed that on consideration, the

board walk proposal, as the least damaging deliverable option, should be taken forward.

Structural investigations are expected to take place along the whole study frontage during the next detailed design stage, which will give us a greater understanding of the loading and stability that can safely be placed upon existing walls. A decision will be made at that point as to the suitability of using / adapting the current wall as the flood defence.

Floodwall on top of the existing quay (Royal Oak frontage)

You said ...

You were concerned over views and heritage impacts. You talked about reinforcing the quay with acceptance of some flooding in the future but with increased resilience. You talked about an offshore breakwater, however we explained that above all other considerations, this option would not pass through current environmental regulations and would therefore not be explored any further by ESCP.

We did ...

We met with Natural England, the Local Planning Authority and the HBC Conservation Officer in late April 2020 to seek further opinion on the most appropriate option to take forward along the Royal Oak frontage based on heritage impact, planning and environmental implications.

The floodwall on top of the quay for flood and coastal erosion protection (the projects leading option) (1), was discussed along with two alternatives: (2) do nothing along the Royal Oak frontage; (3) rebuild the quay at its current height for erosion protection (for H&S requirements a handrail is also likely to be required).

Consensus was that option 2 do nothing, was not an option, although this would reduce environmental impact.

Doing something was the right option, be it for erosion (option 3) or both erosion and flood protection (option 1).

As we do not want to lose the heritage assets, we will need to accept that there will be visual impacts on heritage, but without erosion protection, the heritage may be damaged or lost forever and without flood protection, the heritage assets could be damaged in the longer term with climate change and sea level rise.

At the workshop we shared a potential alternative defence alignment with you. Our consultants AECOM have now appraised the feasibility of this option - **We will be engaging with you and the wider Langstone community on this alignment shortly, to seek your views.**

So please look out for details in a further email / via post over the next few weeks.

With kindest regards

Sam

Samantha Box (MCIWEM C.WEM BSc MSc)

Feasibility, Option Appraisal and Funding Team Leader | T: [REDACTED] [REDACTED] [REDACTED]
Eastern Solent Coastal Partnership, Havant Borough Council, Southmoor Offices, PO91QH

Prior notice of leave



Your privacy matters. The ESCP are working in partnership with four Local Authorities. Should you require information on privacy matters please go to the relevant website for more information:

[Havant Borough Council](#) [Portsmouth City Council](#) [Fareham Borough Council](#) [Gosport Borough Council](#)

Information in this message is confidential and may be privileged. It is intended solely for the person to whom it is addressed. If you are not the intended recipient, please notify the sender, and please delete the message from your system immediately.

B2. Natural England's advice on refined concept designs

From: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
Subject: Langstone FCERM scheme - DAS request for NE feedback on updated concept design options (UDS 5814; DAS/13467)
Date: 08 April 2022 19:07:06
Attachments: [image001.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)
[image008.png](#)
[image009.png](#)
[image010.png](#)

CAUTION: This email came from outside of the council - only open links and attachments that you're expecting.

Dear Hilary

Discretionary Advice Service (Charged Advice)

DAS/13467/302123: Langstone Flood and Coastal Erosion Risk Management (FCERM) Scheme

Langstone FCERM Scheme - Review and refinement of outline design options

Thank you for your consultation on the above dated 03 March 2022.

This advice is being provided as part of Natural England's Discretionary Advice Service. Coastal Partners have asked Natural England to provide advice upon:

- Advice on potential impacts on designated or proposed designated sites
- Advice on Green Infrastructure and/or Priority Habitat delivery
- Advice on biological survey methodology
- Advice on Landscape(seascape)Visual Impact Assessment
- Advice on the ecological mitigation plan
- Advice on monitoring strategy
- Advice on the information for a draft Habitats Regulations Assessment

This advice is provided in accordance with the Quotation and Agreement dated 05th July 2021.

The following advice is based upon the information within the following documents and associated teleconference call on the 17th March 2022.

1. 20220301_Langstone_FCERM_scheme_Design_Review_briefing for NE
2. 20220224_Langstone design freeze sketches
3. 20220317_Leading Options_Natural England (presented at the teleconference)
4. Langstone_OD_chainage_plan
5. Langstone_Frontage4_sub-sections

Coastal Partners seek feedback to feed into the detail design and Environmental Impact Assessment (EIA) work.

Natural England's Comments

Brief summary: Natural England has previously provided comments and feedback on preferred short-listed options/outline design for the Langstone FCERM. These refined concept design options are based on further ground investigation, structural investigation, community input and Early Contractor Involvement (ECI) during 2021 and January 2022. There have been no changes to the options proposed at outline design for Frontages 1A and 2 (Billy Line Footpath and Embankment), Frontage 1B (Mill Lane and Harbourside) or Frontage 6 (Langstone Spit).

As you are aware, the Langstone FCERM frontage will require detailed consideration of the following designated sites: Solent Maritime Special Area of Conservation, Chichester and Langstone Harbours Special Protection Area and Ramsar site, Chichester Harbour Site of Special Scientific Interest and the Langstone Harbour Site of Special Scientific Interest. The frontage east of Langstone Bridge is also within the Chichester Harbour Area of Outstanding Beauty. We therefore advise that the Chichester Harbour Conservancy is involved in the scheme design. Natural England's preference for the FCERM scheme would be the least environmentally damaging deliverable option in relation to the features of interest of the national and international designated sites. It is Natural England's preference that negative environmental impacts are avoided in the first instance and then minimised.

Frontage 3: A3023 to The Look Out

Natural England notes that the updated leading design option will result in no permanent habitat loss from intertidal encroachment into the European Marine Sites.

Frontage 4: Look Out to Winklemarket and Frontage 5: High Street to Royal Oak

Given that the leading options will result in solid encroachment and will lead to a permanent loss of Annex 1 habitat, a qualifying habitat for the Solent Maritime SAC and supporting habitat for the Chichester and Langstone Harbours SPA and Ramsar site, it is Natural England's view that this will have a more damaging impact on the features of interest at the designated sites, and is more likely to undermine the conservation objectives of the designated sites, than the other alternative options.

For Frontage 4, Natural England has previously advised, in brief summary, that the option to construct a reinforced concrete floodwall and boardwalk (based on the available information) in comparison to a solid encroachment would be the lesser of the damaging options. The scale of the loss would be limited to the footprint of any piles, rather than the greater loss of habitat associated with a solid encroachment. Potential shading from the boardwalk on the intertidal habitat however could still reduce the functionality of the SPA in line with the conservation objectives and this matter would need to be fully considered as part of the HRA.

The comments below relate to habitat loss for Frontage 4 and 5.

It is Natural England's view that this loss, and all other matters capable of having a significant effect on designated sites in the Solent, must be addressed in the ways required by Regulation 63 of the Conservation of Habitats and Species Regulations 2017. Where there is encroachment into the designated sites, a full explanation and justification of alternative options will be

required to meet the tests of the Habitats Regulations. Consideration will also need to be given to the obligations under the Wildlife and Countryside Act 1981 in relation to the Site of Special Scientific Interest.

If the encroachment design options for the Langstone FCERM are progressed and the Habitat Regulations Assessment concludes that there is an adverse effect on integrity or uncertainty of an adverse effect on the qualifying features of the designated sites, these options would need to evidence that there are no less damaging alternative solutions that can be delivered for this frontage. If an alternative approach is taken for heritage reasons, a full justification explaining why this is needed will be required.

It is noted that throughout the development of the updated options, the project team have worked to avoid or minimise intertidal encroachment as far as technically possible whilst delivering a viable flood and erosion protection scheme. Natural England encourage any further measures to reduce habitat loss as far as possible.

As mentioned in the teleconference, for Frontage 5, Field to the North of Royal Oak, it was noted that there would be no encroachment directly into the woodland, however it is advisable that an ecological assessment should consider potential impacts to root protection zones and mitigations measures should impacts be identified.

Other Matters

- Habitat losses and gains would need to be fully quantified including temporary habitat disturbances and loss to the foreshore.
- A clear method statement would be required with regards to the restoration of the temporary affected features back to its former condition.
- Once the residual effects have been addressed, consideration should be given to additional environmental enhancements.

Natural England appreciates the complexity of the site including the heritage, landscape, accessibility, and ownership considerations.

For clarification on any points in this letter, please contact Zara Ziauddin on 07789505165.

X The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and

will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely
Zara Ziauddin

Lead Marine Advisor
Thames Solent team
Natural England

From: Crane, Hilary [REDACTED]
Sent: 03 March 2022 15:42
To: Ziauddin, Zara [REDACTED]
Cc: Clemson, Rachael [REDACTED]; ed.rowsell
[REDACTED] Brittan, Amy [REDACTED]
Subject: Langstone FCERM scheme - DAS request for NE feedback on updated concept design options (UDS 5814; DAS/13467)

Dear Zara,

As mentioned previously, Coastal Partners has been working closely with our design consultant AECOM to update and refine the design options for the Langstone FCERM scheme, taking on board feedback from EIA Scoping, community engagement and Early Contractor Involvement (ECI), together with the results of the Ground Investigations and Structural Investigations undertaken last year.

We have prepared the attached briefing note and accompanying design sketches pack to provide an update to Natural England on the refined concept design options that have been developed for Frontage 3 (Ship Inn), Frontage 4 (Look Out to Winklemarket) and Frontage 5 (High Street to Royal Oak) of the Langstone FCERM Scheme. These refined concept design options are based on the outline design (as submitted with the EIA Screening and Scoping request in January 2021) but have been modified and developed following additional information received from further Ground Investigation, Structural Investigation, community input and Early Contractor Involvement (ECI) during 2021 and January 2022.

The briefing note summarises the refined concept design options for Frontages 3, 4 and 5 in order to seek feedback from Natural England under the Discretionary Advice Service (DAS) pre-application agreement for the Langstone FCERM Scheme (DAS UDS 5814) to feed into the detail design and EIA work. Additional cross sections and larger versions of drawings included in this note are available in the accompanying 'Langstone design freeze sketches' PDF drawing pack.

You will see from the briefing note that considerable effort has gone into developing updated options that balance the many constraints along this frontage, in particularly the heritage value (Listed Buildings and Conservation Areas) on the landward side and the ecological value (European and SSSI designated sites on the seaward side). We feel that the updated design options presented achieve the best balance whilst providing the required flood and erosion protection outcomes for the scheme. The briefing note sets out alternative options that were considered during the course of reaching the new updated design options, together with their pros and cons, to show the full consideration of all aspects of the design and surrounding environment. Throughout the development of the updated options, the project team has worked hard to avoid or minimise intertidal encroachment as far as technically possible whilst delivering a viable flood and erosion protection scheme.

We would be grateful if you would be able to provide Natural England's feedback on these updated design options **by 31st March 2022**, so that advice can feed into the 50% detailed design review that will take place in April. If it would be helpful to arrange a MS Teams meeting to talk through the updated design options then please let me know some suitable dates and I can arrange this.

Kind regards,
Hilary

Hilary Crane Mem.MBA CMarSci MIMarEST

Coastal Environmental Project Engineer | M: [REDACTED]
Coastal Partners, Havant Borough Council, Public Service Plaza, Havant, PO9 2AX

Prior notice of leave: 21st – 25th March inclusive



Think before you print. Your privacy matters. Coastal Partners are working in partnership with four Local Authorities. Should you require information on privacy matters please go to the relevant website for more information: [Havant Borough Council](#) [Portsmouth City Council](#) [Fareham Borough Council](#) [Gosport Borough Council](#)

Information in this message is confidential and may be privileged. It is intended solely for the person to whom it is addressed. If you are not the intended recipient, please notify the sender, and please delete the message from your system immediately.

This message has been sent using TLS 1.2 This email and any attachments is intended for the named recipient only. If you have received it in error you have no authority to use, disclose, store or copy any of its contents and you should destroy it and inform the sender. Whilst this email and associated attachments will have been checked for known viruses whilst within the Natural England systems, we can accept no responsibility once it has left our systems. Communications on Natural England systems may be monitored and/or recorded to secure the effective operation of the system and for other lawful purposes.

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

From: [REDACTED]
To: [REDACTED]
Subject: RE: Langstone FCERM scheme - DAS request for NE feedback on potential alternative alignment for Frontage 4 (UDS 5814; DAS/13467)
Date: 28 September 2022 13:25:11
Attachments: [image001.png](#)
[image011.png](#)
[image012.png](#)
[image013.png](#)
[image014.png](#)
[image015.png](#)
[image016.png](#)
[image017.png](#)
[image018.png](#)
[image019.png](#)

CAUTION: This email came from outside of the council - only open links and attachments that you're expecting.

Good morning Hilary,

Firstly aware we spoke on the phone but please accept my apologies in the delay in getting this advice to you in writing.

Natural England's preference for the scheme would be the least environmentally damaging deliverable option in relation to the features of interest of the national and international designated sites and therefore we welcome any efforts intended to minimise impacts from the scheme. Natural England would therefore be supportive of changes to the alignment which would both reduce the amount of foreshore encroachment thereby reducing the amount of habitat loss as well as reducing visual disturbance to birds on the foreshore from people and dogs using the footpath through improved screening.

However, we note that even with this alternative alignment there would still be some encroachment between The Green and the Winklemarket to meet the 1.5m footpath width requirements, which will lead to a permanent loss of designated sites including the Solent Maritime Special Area of Conservation, Chichester and Langstone Harbours Special Protection Area and Ramsar site and loss of Chichester Harbour Site of Special Scientific Interest.

It is Natural England's view that this loss, and all other matters capable of having a significant effect on designated sites in the Solent, must be addressed in the ways required by Regulation 63 of the Conservation of Habitats and Species Regulations 2017. Consideration will also need to be given to the obligations under the Wildlife and Countryside Act 1981 in relation to the Site of Special Scientific Interest.

It is Natural England's view that there remains a likely significant effect on the European designated sites from this option. As you are aware, where there is a likelihood of significant effects (excluding any measures intended to avoid or reduce harmful effects on the European site), or there are uncertainties, a competent authority should fully assess (by way of an "appropriate assessment") the implications of the proposal in view of the conservation objectives for the European site(s) in question. Appropriate assessments cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned. Complete information is required to ensure that the proposal will not affect the integrity of the European sites. The Appropriate Assessment would need to assess the impact of

the scheme on the conservation objectives of the designated sites. Each qualifying feature should be assessed in line with the maintain or restore conservation objectives.

If this assessment concludes that there is an adverse effect on integrity or uncertainty of an adverse effect on the qualifying features of the designated sites, the next stage is to consider if this can be addressed by conditions or other restrictions. If this is not possible, then alternative options that would have a lesser environmental impact should be considered. If there are no other deliverable alternative solutions the next stage is to consider imperative reasons of overriding public interest. In this instance where a competent authority determines it necessary to proceed with the project notwithstanding an adverse effect, because there are no alternative solutions and there are imperative reasons of overriding public interest, all necessary compensatory measures must be secured. It is understood that this is likely to be considered through the Regional Habitat Compensation Programme.

Please do not hesitate to come back to me should you require further information.

Best wishes,
Jess

Jessica Taylor
Marine Senior Adviser
Thames Solent Team

Mob: [REDACTED]

From: Crane, Hilary
Sent: 20 July 2022 08:59
To: Ziauddin, Zara [REDACTED]
Cc: Clemson, Rachael <[REDACTED]> Rowsell, Ed
[REDACTED] Brittan, Amy [REDACTED]

Subject: Langstone FCERM scheme - DAS request for NE feedback on potential alternative alignment for Frontage 4 (UDS 5814; DAS/13467)

Dear Zara,

Following stakeholder feedback on the 50% detailed design for the Langstone FCERM scheme, Coastal Partners is considering a potential alternative alignment for the flood wall along the eastern part of Frontage 4 (between the Green Cottage and the Winklemarket / High Street). I have attached a slide pack ('F4_Seaward Alignment.pdf') that sets out a description of the potential alternative alignment, its pros and cons, together with artistic illustrations of both the potential seaward alignment and the current 50% design (landward) alignment. I have also attached a high level plan and a cross section for the alternative alignment.

In summary, this alternative alignment would:

- Move the flood wall to the seaward side of the footpath along this section of Frontage 4, rather than it being aligned on the landward side adjacent to the existing buildings/property walls.
- The footpath would no longer be diverted around The Green at Green Cottage (as is proposed in the current 50% design).
- This alternative alignment would likely reduce the amount of foreshore encroachment compared to the current 50% design, particularly around The Green where the footpath would remain along its existing alignment. There would still be some encroachment between The Green and the Winklemarket to meet the 1.5m footpath width requirements, as in the current 50% design.
- This alternative alignment would create a 1.1m upstand wall on the seaward side of the footpath, which would provide screening and therefore reduce visual disturbance to birds on the foreshore from people and dogs using the footpath.

We are currently seeking feedback from statutory consultees on this potential alternative alignment to inform the further development of the detailed design for this part of the frontage. Please could you advise if Natural England has any comments or feedback on this potential alternative alignment for Frontage 4?

Kind regards,
Hilary

Hilary Crane Mem.MBA CMarSci MIMarEST

Coastal Environmental Project Engineer | M: [REDACTED]
Coastal Partners, Havant Borough Council, Public Service Plaza, Havant, PO9 2AX

Prior notice of leave: 7th to 18th October inclusive



Think before you print. Your privacy matters. Coastal Partners are working in partnership with four Local Authorities. Should you require information on privacy matters please go to the relevant website for more information: [Havant Borough Council](#) [Portsmouth City Council](#) [Fareham Borough Council](#) [Gosport Borough Council](#)

Information in this message is confidential and may be privileged. It is intended solely for the person to whom it is addressed. If you are not the intended recipient, please notify the sender, and please delete the message from your system immediately.

This message has been sent using TLS 1.2 This email and any attachments is intended for the named recipient only. If you have received it in error you have no authority to use, disclose, store or copy any of its contents and you should destroy it and inform the sender. Whilst this email and associated attachments will have been checked for known viruses whilst within the Natural England systems, we can accept no responsibility once it has left our systems. Communications on Natural England systems may be monitored and/or recorded to secure the effective operation of the system and for other lawful purposes.

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

Gavin Holder

From: Tully, Andy (Defra) <Andy.Tully@defra.gsi.gov.uk>
Sent: 26 September 2014 15:57
To: Gavin Holder
Cc: Marc Bryan; Leighton, Louise (Defra)
Subject: RE: Portsmouth Coastal Defence scheme - impacts on European sites

Expires: 26 September 2015 00:00

Gavin,

Thanks for sending through the summary of the proposed Portsmouth scheme for clarity, which I've discussed with colleagues. I'll answer your key points in turn (ie IROPI and 'Briels').

IROPI

Provided the proposed scheme is in line with the higher level Strategy (Portsea Island Coastal Defence Strategy Plan) and the impact on the integrity of the sites are within the range anticipated in the HRA for the higher level Strategy, which from the information provided appears to be the case, there is no need to revisit the IROPI grounds (noting that Defra agreed that Havant Borough Council may approve the higher level Strategy under IROPI in 2011).

Briels

Considerations of the 'Briels' judgment would only appear relevant to any proposed mitigation actions. It will be for the competent authority to assess the implications of the judgment in any proposed mitigation works and whether in light of Briels such works should instead be included within the previously anticipated compensatory measures identified in the higher level Strategy, which we understand will be delivered through the Environment Agency's Regional Habitat Creation Programme in order to ensure that the balance of losses and gains is maintained. It is also worth noting that EA has recently considered the impact of Briels on an entirely separate case in the north of England. You may want to suggest to the LPRG that they speak to Richard Handley or Duncan Huggett at the EA, who I understand were involved in the case.

I hope this is helpful.

Kind regards

Andy

From: Gavin Holder [<mailto:gavin.holder@havant.gov.uk>]
Sent: 25 September 2014 09:57
To: Tully, Andy (Defra)
Cc: Marc Bryan
Subject: RE: Portsmouth Coastal Defence scheme - impacts on European sites
Importance: High

Hi Andy,

Thank you for talking with me on Tuesday and your subsequent email below.

Following our conversation, I have prepared a summary of our scheme proposals to ensure you understand what I was trying to explain over the phone about our proposed scheme, as it was quite difficult to explain with no visual aids. The attached document also includes information about our concerns over the potential implications of the Briels Case, which has come up as an issue right on our deadline of applying for significant Grant in Aid funding from the Environment Agency on a Nationally important Flood and Coastal Erosion Risk Management Scheme (£55 million scheme, including contingency).

Please can you have a look over this summary and provide some advice as requested within it. I can not stress enough, how important it is that we resolve this issue over the coming days due to our forthcoming meeting with

the Environment Agency's Large Project Review Group, and would appreciate advice from you as soon as you are able. I have asked for a letter of support from you (Defra), and I would especially be keen to know if you are able to provide such a letter, in advance of you actually providing it. Please give me a call if you wish to discuss any element of the attached summary and request for advice, and if you're directed to my voicemail, please leave me a message and I will call you back as soon as I am able.

I thank you in advance for your advice on this issue.

Many Thanks,
Gavin

Regards,

Gavin Holder
Coastal Project Engineer

Tel: 02392 446121
Mobile: 07720076277

Our website: <http://www.escp.org.uk>



From: Tully, Andy (Defra) [<mailto:Andy.Tully@defra.gsi.gov.uk>]
Sent: 23 September 2014 13:04
To: Gavin Holder
Subject: Portsmouth coastal defence scheme - impacts on European sites

Hi Gavin,

We spoke. Here is the [link](#) to the EC's suggested Habitats Directive Article 6(4) reporting template, which I normally advise competent authorities to use when putting together a statement of case under IROPI (imperative reasons of overriding public interest). The template is provided as an annex at the end of the guidance doc.

I understand that NE has advised that the impacts of this specific scheme can be mitigated through the creation of compensatory habitat within the European site but you raised concerns about whether the approach in this instance was 'Briels' compliant. As discussed, we are currently discussing the implications of the Briels case with the agencies and OGDs, and we have not issued any guidance.

In view of the above, I'll get in touch with my NE counterparts just to make sure that they are joined up with the local team that are providing advice in this instance, although I'm cautious of getting involved in the case itself unless of course the council decide to make an IROPI case. In the event that you would prefer to make an IROPI case, I'd be happy to provide comments on a first draft (contact details below).

Kind regards

Andy


Department
for Environment
Food & Rural Affairs

Andy Tully

Zone 1/16, Temple Quay House, Temple Quay, Bristol, BS1 6PN

Direct dial: +44 (0) 0117 372 3543

Andy.Tully@defra.gsi.gov.uk

Department for Environment, Food and Rural Affairs (Defra)

This email and any attachments is intended for the named recipient only. If you have received it in error you have no authority to use, disclose,

store or copy any of its contents and you should destroy it and inform the sender.

Whilst this email and associated attachments will have been checked for known viruses whilst within Defra systems we can accept no responsibility once it has left our systems.

Communications on Defra's computer systems may be monitored and/or recorded to secure the effective operation of the system and for other lawful purposes.

Information in this message is confidential and may be privileged. It is intended solely for the person to whom it is addressed. If you are not the intended recipient, please notify the sender and delete the message from your system immediately.

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

Summary of legal advice provided by Steve Clifton, Natural England on HRA process for considering the removal of Great Salterns Quay as habitat creation and the proposed bird island footprint North Portsea Island Phase 4 Eastern Road

1. Removal of Great Salterns Quay for habitat creation

Question: Can this additional compensation requirement (and how alternatives and IROPI have been considered) be simply added to the HRA derogation and original compensation requirements that were calculated at the SMP level as unforeseen circumstances or does this phase of the NPI scheme need to be treated as a separate plan or project, which will require its own Secretary of State approval via the derogation process at the scheme level?

Natural England's Response - *The Shoreline Management Plan has been through the Habitat Regulation Assessment process and the derogation tests. The Secretary of State has therefore approved the plan and the decision to have a coastal defence at this location (Hold the Line). We consider any additional loss of habitat as a result of any schemes proposed should be considered as additional compensatory requirements for this original Habitat Regulation Assessment and agree that the Regional Habitat Compensation Programme is a flexible enough compensatory mechanism within which this additional compensation could be included.*

Another HRA is not required, as the alternatives and IROPI test has already been agreed at the plan and strategic level, it therefore follows that the Secretary of State would approve a coastal defence scheme at this location. The process here is to ascertain that this coastal defence scheme avoids impacting on the conservation objectives of the N2K sites and where it does suitable additional compensation is agreed.

2. Bird Island

Question: Can a case be made that Option 2 is the most ecologically beneficial outcome/ least environmentally damaging option for the Solent European Marine Site (EMS) as a whole as it will create new SPA/Ramsar bird roost habitat (which is a critical supporting habitat under the greater threat in the Solent) and the resulting impacts on the SAC will be addressed by the habitat creation compensation measures? Or does the alternatives test mean that the avoidable SAC encroachment of Option 2 will fail to pass the derogation requirements?

Natural England's Response - *As stated in the response above, we do not consider another Habitat Regulation Assessment is required for this project since the decision has been made that a coastal defence scheme is required at this location. The objective here is to ascertain that the scheme avoids an impact on the conservation objectives of the SPA and SAC and seeks to find the most effective compensatory measures where an impact occurs. The two options put forward for this part of the scheme should be considered as part of the overall scheme and the best option determined based on which is the most suitable for maintaining the site integrity of both the SPA and SAC.*

In terms of the loss of shingle habitat within the Solent Maritime SAC an assessment should be made of what this loss would mean in terms of an impact on the conservation objectives of the SAC. The Supplementary Advice on Conservation Objectives for the site should be referred to when determining this. For the reasons given above, even if it was determined that this loss undermined the conservation objectives of the site, there would be no need for this to be approved by the Secretary of State through the derogation process.

Sue Burton
12th September 2018

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

Date: 26th May 2016



Stephen Treby
Natural England
1st Floor
Temple Quay House
2 The Square
Bristol
BS1 6EB
0300 060 1821

BY EMAIL ONLY

Dear Gavin,

Thank you for your detailed survey response to the Formal Consultation for the proposed Solent and Dorset Coast SPA.

We note your comments regarding the potential socio-economic impacts of classifying the site and will ensure the Consultation Report outlines your responses which contain socio-economic information. The Consultation Report will be submitted to Defra along with comments on the scientific evidence.

An SPA classification does not aim to stop or restrict activities occurring within the site, rather to ensure that the conservation of rare, endangered and migratory bird populations is reflected in how activities which may impact the bird features are managed. There are examples of other SPAs (e.g. Liverpool Bay SPA, Outer Thames SPA) located in areas that are highly important in commercial terms where activities are managed accordingly.

We have undertaken some research to assess whether any of the activities that currently take place within the draft boundary could potentially have a negative impact upon foraging terns. This research (known as a Vulnerability Assessment) **did not** identify any activities which would require additional management measures to those already in place across the site.

This is because foraging terns are considered to have a low sensitivity to most activities that occur within the site. This includes the various Flood and Coastal Erosion Risk Management schemes in place across the site. Whilst we cannot rule out that new evidence, or new activities in the future might need some management measures, based on our current understanding we consider this unlikely.

Within the remainder of this response I will endeavour to demonstrate why we feel that the proposed boundary of the pSPA is appropriate:

Modelled Approach

It is important to note that the models used to define site boundaries for tern species are based on direct observations of the foraging behaviour of breeding terns from many colonies around the UK over a period of up to three years. The patterns of tern distribution predicted by the models have been shown to match with the observed distributions of terns at sea recorded in other years and at other colonies.

As outlined in the appendices of the Departmental Brief, the models were subjected to a process of cross-validation which indicated a satisfactory match between model predictions and independent survey data (as described in summary in the Departmental Brief). The cross-validation exercise demonstrated a degree of consistency in terns' foraging distribution between years and sites, and significantly reduced uncertainty regarding the reliability of the predictive models, and hence the boundaries based upon them.

Validation

The confidence in the reliability of these models was further enhanced via verification survey work undertaken at a range of locations around England in 2015 (Perrow *et al* 2015). The verification work involved surveys of tern activity at nine sites around England, all within the boundaries of pSPAs or within areas that may be identified as pSPAs in due course. This programme of surveys confirmed the occurrence of foraging terns in every system in which they were predicted to occur and in which they were looked for (Perrow *et al.* 2015). The verification work was further reinforced by a similar program in Northern Ireland (Allen & Mellon Environmental Ltd, 2015) as noted in the Departmental Brief, which confirmed the presence of terns up to and beyond the furthestmost alongshore limits of modelled boundaries and also provided some evidence to indicate that larger tern species feed further out to sea than the limits of the modelled boundaries. The English site verification work was not reported in the Departmental Brief as the surveys were in progress at the time the document was being drafted. The report on this work (Perrow *et al* 2015) is now available and is listed in the references provided below.

It is important to note that it is not standard practice via ground truthing to survey every location where presence/abundance has been inferred by methods such as simple interpolation or, as in this instance, by more complex modelling. Similar model-based approaches have been used to underpin marine SPAs already (e.g. Liverpool Bay SPA, Outer Thames Estuary SPA, Falmouth Bay to St Austell Bay pSPA) and this peer-reviewed approach demonstrates an **objective, repeatable and scientific method** to boundary identification. In the light of the verification work carried out as detailed, Natural England is content that the cross-validation of model predictions and subsequent programmes of verification work provide satisfactory confidence that model predictions are not simply reliable in locations where verification work was carried out, but equally reliable in all the other locations in which verification work was not carried out.

Maximum Curvature

The sea areas with a level of usage by terns that merit inclusion within the pSPA have been defined objectively following UK marine SPA selection guidance¹ and established marine SPA

¹ Webb, A. & Reid, J.B. (2004). Guidelines for the selection of marine SPAs for aggregations of inshore non-breeding waterbirds. Annex B in: Johnston, C., Turnbull, C. Reid, J.B. & Webb, A. (2004). Marine Natura 2000: Update on progress in Marine Natura.

boundary delineation methods² using a method known as Maximum Curvature Analysis (MCA). This approach has been used for boundary setting in several other marine SPAs and pSPAs (e.g. Liverpool Bay SPA and Outer Thames Estuary SPA). The approach is based on the principle of diminishing returns and explicitly seeks to **exclude** areas that are used by the birds, at a level which is so low that their inclusion would result in an increase in site extent that would be disproportionate to the importance of the area(s) for the birds. MCA provides an objective way in which to define a threshold level of usage that distinguishes between areas warranting inclusion and those that do not and is not reliant on a “target” for how much area should be protected (which would be arbitrary and subjective).

We acknowledge that the Maximum Curvature Analysis (MCA) approach does not clarify the functional importance of areas inside or outside the proposed boundary.

MCA provides an objective, repeatable and established method for defining a limit in the marine environment in which there is no scope to define boundaries based on limits to clearly defined habitats. In this instance, as in other applications of the MCA approach (e.g. Liverpool Bay SPA, Outer Thames Estuary SPA), MCA has resulted in the exclusion of large areas of sea that support some level of usage by birds from within site boundaries. Natural England considers that the application of MCA in this case, as in others, has provided a pragmatic and conservative approach to boundary setting, particularly when viewed in the context of the far wider sea areas which the scientific literature indicates is within the foraging range for these species.

Natural England does not consider that the complexity of the Solent and Dorset Coast pSPA coastline is so markedly different from many other SPAs/pSPAs. We are confident that the robustness of model predictions apply equally here as elsewhere.

We note that you are currently collecting data through the Eastern Solent Coastal Partnership - Solent Wide Bird Study app, to inform your future Flood and Coastal Erosion Risk Management works. Please do send us this data when it is available.

I hope that this response is helpful and that I have provided sufficient information for you to re-assess the Eastern Solent Coastal Partnerships position towards the proposed SPA. If I can provide any further information or explanation please don't hesitate to contact me directly.

Yours sincerely,



Stephen Treby
Marine Adviser
Dorset, Hampshire Coast and IoW
Natural England

Office: 0300 060 1821
Mobile: 07824 600389
Email: stephen.treby@naturalengland.org.uk

² O'Brien, S.H., Webb, A., Brewer, M.J., & Reid, J.B. 2012. Use of kernel density estimation and maximum curvature to set Marine Protected Area boundaries: Identifying a Special Protection Area for wintering red-throated divers in the UK. *Biological Conservation* **156**: 15-21.

References

- Allen & Mellon Environmental Ltd. 2015. *Validation of selected tern foraging areas associated with breeding colony SPAs. Reference Number CT2 (4)*. Unpublished report to Department of the Environment Northern Ireland. 53pp.
- O'Brien, S.H., Webb, A., Brewer, M.J., & Reid, J.B. 2012. Use of kernel density estimation and maximum curvature to set Marine Protected Area boundaries: Identifying a Special Protection Area for wintering red-throated divers in the UK. *Biological Conservation* **156**: 15-21.
- Perrow, M.R., Harwood, A.J.P. & Caldow, R.W.G. 2015. Tern verification surveys for marine sites. Final Report by ECON Ecological Consultancy Limited to Natural England. 109pp.
- Thaxter, C.B., Lascelles, B., Sugar, K., Cook, A.S.C.P., Roos, S., Bolton, M., Langston, R.H.W., Burton, N.H.K. (2012): Seabird foraging ranges as a preliminary tool for identifying candidate Marine Protected Areas. *Biological Conservation*, **156**, 53-61.
<http://publications.naturalengland.org.uk/publication/6688364374786048>
- Webb, A. & Reid, J.B. (2004). Guidelines for the selection of marine SPAs for aggregations of inshore non-breeding waterbirds. Annex B in: Johnston, C., Turnbull, C. Reid, J.B. & Webb, A. (2004). *Marine Natura 2000: Update on progress in Marine Natura*.

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

Zone 1/06, Temple Quay House
2 The Square
Temple Quay
Bristol BS1 6EB

Telephone

Website www.defra.gov.uk



Andrew Colenutt
North Solent SMP Project Manager
New Forest District Council
Appletree Court
Lyndhurst
Hampshire
SO43 7PA

Our ref NSSS57

4 April 2011

Dear Mr Colenutt

NORTH SOLENT SMP

1. Thank you for supplying the Habitats Regulations Assessment and the completed Appendix 20 application for the North Solent SMP.
2. I recognise that your Council has fulfilled its obligations under the Habitats Regulations and appropriately assessed the impacts of the proposed SMP on the European sites that may have been affected.
3. I am satisfied that you have carried out a thorough evaluation of alternative solutions. I accept that there are no alternative solutions to the preferred options that would have a lesser effect on the integrity of the European sites.
4. Given that coastal flooding and erosion poses a risk to 51,000 residential and commercial properties, two major ports, industrial assets and key infrastructure, I consider that you have made a strong case to justify the potential damage on grounds of imperative reasons of overriding public interest.
5. I am satisfied that you have taken appropriate steps to secure suitable compensatory habitat within the Southern Regional Habitat Creation Programme to ensure that the overall coherence of the Natura 2000 network is protected.
6. Consequently, I can confirm that, in respect of regulation 62 of the Conservation of Habitats and Species Regulations 2010, Defra has no objections to your Council's intention to approve this strategy.
7. I would be grateful if you could inform Craig Lee once the Strategy is approved so that he can forward the details to the European Commission.



8. I am copying this letter to Paul Murby in Defra, Jenny Buffrey in the EA and Chris McMullon in Natural England.

Yours sincerely



Steve Lee-Bapty
Head of Protected Areas
Acting on behalf of the Secretary of State

Direct Line 0117 372 8615

Email steve.lee-bapty@defra.gsi.gov.uk

C2. PEMS Secretary of State derogation confirmation letter

Biodiversity Programme
Department for Environment, Food and Rural Affairs
Zone 1/16
Temple Quay House
2 The Square
BRISTOL BS1 6PN



Telephone 0117 372 3535

Email Simon.Hopkinson@defra.gsi.gov.uk

Website www.defra.gov.uk

Anthony Bishop
Environment Agency
Guildbourne House
Chatsworth Road
Worthing
BN111LD

Date 21 September 2012

Dear Anthony

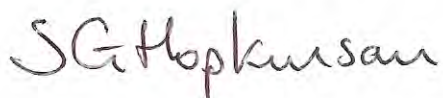
Portchester to Emsworth Coastal Strategy

1. Thank you for supplying the Habitats Regulations Assessment and the completed Appendix 20 application for the Portchester to Emsworth Coastal Strategy.
2. I recognise that the Environment Agency has fulfilled its obligations under regulation 62 of the Conservation of Habitats and Species Regulations 2010 (as amended) and appropriately assessed the impacts of the Strategy on the European sites that may have been affected.
3. I am satisfied that you have carried out a thorough evaluation of alternative solutions. I accept that there are no feasible alternative solutions to the preferred options that would have a lesser effect on the integrity of the European sites.
4. Given that coastal flooding and erosion poses a risk to a number of large urban settlements, key infrastructure and priority habitats, I consider that you have made a strong case to justify the potential damage on grounds of imperative reasons of overriding public interest.
5. I also note that the Strategy policies will, in the short term, prevent contamination and intertidal loss at a number of European sites, including the protection of saline lagoon features and important high level roosting areas for key bird species. I understand that further studies are required in order to conclude the long term option for the management of these features. You should therefore note that the Environment Agency may need to submit a further statement of case to the Secretary of State in the event that additional impacts are identified for the long term management of these features.
6. I note that the Environment Agency is unable to provide compensatory habitat within the Strategy area itself, as there are conflicts with the need to maintain high level roosting areas for key bird species, which were deemed the limiting factor for

bird populations within the harbours. Therefore the total estimated loss of 35.5ha of intertidal loss by year 100 will be compensated through a managed realignment project further east along the coast at Medmerry. I also note that in order to manage in combination impacts from other local coastal flood risk management strategies and projects, a maximum of 91.5ha is likely to be required. I understand that the Medmerry project is currently due for completion in April 2013 and is estimated to create around 183ha of new intertidal habitat.

7. In view of the above, I am content that the Environment Agency has taken appropriate steps through its Southern Regional Habitat Creation Programme to ensure that compensatory measures will be in place to offset predicted losses before they arise. I also note that given future uncertainties, the Environment Agency are committed to the need to improve understanding in order to support firmer policy decisions in the later epochs.
8. Consequently, I can confirm that, in respect of regulation 62(5) of the Conservation of Habitats and Species Regulations 2010, Defra has no objections to the Environment Agency's intention to approve the Strategy.
9. I would be grateful if you could inform Andy Tully once the Strategy is approved so that he can forward the details to the European Commission.
10. I am copying this letter to Paul Murby in Defra, Nikki Hiorns in Natural England and Raahil Javaheri in the Environment Agency.

Yours sincerely

A handwritten signature in dark ink, reading 'SG Hopkinson'. The signature is written in a cursive, slightly slanted style.

Simon Hopkinson
Head of International Protected Areas Team, Defra EU and UK Biodiversity Policy