

# **Isle of Grain to South Foreland Shoreline Management Plan (SMP) Review**

Appendix K – Retrospective Water Framework Directive  
Assessment

## Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Approved by
1	0	Initial Draft	07.12.09	S Hedgecott
	1	Amendments following officer consultation	19.01.10	T Edwards

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## Glossary

AA	Appropriate Assessment
ATL	Advance The Line (an SMP policy option)
BQE	Biological Quality Element
FWB	Freshwater Body
GWB	Groundwater Body
HTL	Hold The Line (an SMP policy option)
MR	Managed Realignment (an SMP policy option)
NAI	No Active Intervention (an SMP policy option)
ROPI	Reasons of Overriding Public Interest
RBD	River Basin District
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SMP/SMP2	Shoreline Management Plan (the Isle of Grain to South Foreland plan is specifically an SMP2)
SPA	Special Protection Area
SPZ	Source Protection Zone
WFD	Water Framework Directive
TraC	Transitional or Coastal Water Body

# 1

## Introduction

### 1.1

#### *Purpose of the report*

The Water Framework Directive (WFD) came into force in 2000 and is the most substantial piece of European Union water legislation to date. As such the Directive will need to be taken into account in the planning of all new activities in the water environment.

The Environment Agency (the competent authority in England and Wales responsible for delivering the Directive) has issued guidance that explains how to build the environmental objectives of the WFD into Shoreline Management Plans (SMP) <sup>(1)</sup>. The guidance describes the methodology for assessing the potential physical and hydromorphological changes and consequent ecological impacts of SMP policies.

This report uses the guidance to identify the compatibility of the **Isle of Grain to South Foreland Shoreline Management Plan 2** (SMP2) with the Directive's environmental objectives. The SMP2 policies were originally finalised, after consultation, in Spring 2008 and hence this assessment is retrospective. As such, and in line with the guidance, the assessment aims: (a) to identify if the proposed SMP2 policies are likely to result in any hydromorphological or physical changes which would result in a risk of failing the WFD's objectives for the water bodies in question; (b) in the cases where such risk exists, to assess the compliance of the proposed SMP2 policies with Article 4.7 of the Directive (see Section 2.4 for further explanation); and (c) if required, to identify any additional mitigation measures which should be included during on-going work to implement the SMP2 proposals.

### 1.2

#### *Background*

The WFD was transposed into English and Welsh law as the *Water Environment (Water Framework Directive) (England and Wales) Regulation, 2003*. Its purpose is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwaters.

The framework for delivering the WFD is through River Basin Management Plans (RBMP) produced one for each River Basin District (RBD). For the Isle of Grain to South Foreland SMP2 the relevant Districts are the Thames RBD (which covers the Isle of Grain and Isle of Sheppey, including The Swale) and the South East RBD (which covers the remainder of the SMP2 coastline from Whitstable eastwards).

For all water bodies in these districts the Directive requires the setting of environmental objectives. These are based on the default objectives in Article 4 of the WFD, *viz*:

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<sup>(1)</sup> Environment Agency, 2009, Water Framework Directive: step by step process for assessing Shoreline Management Plans, 82\_09

- Implement the necessary measures to prevent deterioration of the status of all bodies of surface water (Article 4.1(a)(i));
- Protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status by 2015 (Article 4.1(a)(ii));
- Protect and enhance all artificial and heavily modified bodies of water, with the aim of achieving good ecological potential and good surface water chemical status by 2015 (Article 4.1(a)(iii));
- Progressively reduce pollution from priority substances and cease or phase out emissions, discharges and losses of priority hazardous substances (Article 4.1(a)(iv));
- Prevent “deterioration in status” and prevent or limit input of pollutants to groundwater. (Article 4.1(b)(i)).

In order to achieve these environmental objectives, a set of action measures for each RBD has been proposed. These measures are proposed to maintain or return the existing environment to a position of at least “good” status (for water bodies which are not artificial or heavily modified) or potential (for artificial water bodies and heavily modified water bodies, AWBs and HMWBs) as defined by the WFD. These mitigation measures are included in each RBMP’s “programme of measures”.

### 1.3

#### ***Status of River Basin Management Plans***

This retrospective assessment was undertaken in November 2009, after the first round of public consultation on the draft Thames and South East RBMPs but before consultation responses had been included in the revised Plan. Therefore, the information was originally taken from the revised draft Thames RBMP and South East RBMP published in September 2009. The details were then confirmed in January 2010 following consultation with the Environment Agency and after the RBMPs were finalised (December 2009).

## 2

# Assessment Methodology

The methodology used in this assessment follows the Environment Agency's guidance which breaks the assessment down into a series of clearly defined steps, to provide a transparent and auditable account of the assessment of SMP policies. These steps are summarised below (section 2.1 to 2.4). For a full account of the process the reader should refer to the guidance.

### 2.1

#### *Step 1: Scope the SMP - Data Collation*

To make the assessment as comprehensive as possible, a data collation exercise was undertaken to identify all transitional and coastal (TraC) water bodies present in the Isle of Grain to South Foreland SMP2 study area, highlighted in Figure 1. In addition, all river and lake water bodies were identified that may be influenced by SMP2 policies. These water bodies were identified through:

- Overlay of the Environment Agency's water body GIS layers with the SMP2 policy units GIS layer;
- Examination of the Environment Agency's Flood Map (available on the Environment Agency web site, [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)); and
- Identification of any tidal limiting structures on river water bodies from Ordnance Survey mapping and internet searches.

For each relevant water body the following information was obtained / determined:

- WFD water body identification number;
- Water body classification details (including information on relevant Biological Quality Elements<sup>(2)</sup> and any designation as an artificial or heavily modified water body;
- The relevant WFD environmental objectives;
- Actions from the programme of measures in the Thames RBMP and South East RBMP <sup>(3)</sup> relevant to the water bodies in the Isle of Grain to South Foreland SMP2 area.

These actions were repeated for groundwater bodies associated with the SMP2 area, with further emphasis given to (a) identifying any groundwater bodies considered to be at risk of failing the objectives of the WFD as a result of saline intrusion associated with groundwater abstraction, and (b) comparing the locations of groundwater source protection zones (available

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<sup>(2)</sup> The assessment of ecological status or potential of water bodies is carried out with the use of biological indicators from several groups of organisms – referred to in the WFD as “biological quality elements”. For example: for inland surface waters (river and lake water bodies), the assessment might include consideration of factors relevant to phytoplankton, macrophytes, benthic and macro invertebrates and fish.

<sup>(3)</sup> Environment Agency River Basin Management Plan, Thames River Basin District, December 2009.  
Environment Agency River Basin Management Plan, South East River Basin District, December 2009.

on the Environment Agency web site, [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)) with possible future coastal / estuarine frontage alignments.

Finally, where there were discrepancies between water body boundaries and SMP2 unit boundaries, these were highlighted and recommendations were made, where appropriate, to change the SMP2 boundaries to attain consistency with water body boundaries.

## 2.2

### ***Step 2: Define WFD Features and Issues***

For each of the water bodies highlighted as relevant in step 1, an assessment was made of the potential impact of generic SMP policies (Advance The Line ATL, Hold the Line HTL, No Active Intervention NAI, Managed Realignment MR) on physical and hydromorphological characteristics of water bodies (be they tidal or riverine). This was used to identify for each pertinent water body the hydromorphological conditions which have the potential to be modified by SMP policies with consequent significant effect on a water body's biological quality elements. The conclusions of this are summarised in **Assessment Table 2**. That table also presents for each water body its classification, relevant actions proposed in the programme of measures for the Thames River Basin District (RBD) and South East RBD, and the relevant WFD environmental objectives from Article 4.1 of the WFD, identified from the following list:

- WFD1 - no changes affecting “high” status sites;
- WFD2 - no changes that will cause failure to meet surface water “good” ecological status or potential (where potential relates to HMWB or AWB) or result in a deterioration of surface water ecological status/potential;
- WFD3 - no changes which will permanently prevent or compromise the environmental objectives being met in other water bodies;
- WFD4 - no changes that will cause failure to meet “good” groundwater status or result in a deterioration of groundwater status.

The potential actions from the programme of measures include all those related to achieving good physical status or potential (excluding those related to fisheries, navigation and, for freshwater bodies, abstraction). It is probable that some or many of these may not be directly relevant to implementation of SMP2 policies, especially for river water bodies. However, all actions from the RBMPs are included since these could inform future schemes arising from the SMP2, including those that could affect the physical interface between coastal/transitional water bodies and river water bodies.

## 2.3

### ***Step 3: Assess Preferred SMP Policies Against WFD Environmental Objectives***

In this stage of the assessment the potential changes in physical and hydromorphological processes that could result from the preferred SMP policies are assessed against the four WFD environmental objectives. For each SMP2 policy unit, the potential changes in relevant physical and hydromorphological processes were identified and recorded in **Assessment Table 3**.

The assessment did not only consider coastal and transitional water bodies, but also the potential impact on associated river water bodies and



groundwater bodies, particularly relevant to frontages where the preferred policy was NAI or MR. These policies could potentially result in increased saline incursion, benthic habitat modification and other changes in river water bodies, and a risk of saline intrusion into groundwater bodies.

However, it should be noted that the WFD consideration of risks of saline intrusion of groundwater bodies relates in particular to the impact of water abstractions. If a coastal system changes due, for example, to managed realignment this is considered a return to more natural conditions. Under such circumstances, any consequent saline intrusion of the underlying groundwater would not result in a Poor Status classification.

Following this assessment the cumulative effects of all the SMP2 policies were assessed for each water body, and the outcome recorded in **Assessment Table 4**.

## 2.4

### ***Step 4: Complete WFD Summary Statement***

Where it was concluded under Step 3 that any SMP policy presents a significant risk of failure to meet any of the four WFD environmental objectives, a Water Framework Directive Summary Statement was completed; **Assessment Table 5**. This table summarises the considerations made in SMP development that are pertinent to Article 4.7 of the WFD, specifically:

- Assess whether all appropriate mitigation measures for potential new modifications have been included in the preferred SMP policy;
- Present evidence that the preferred SMP policy is being promoted for reasons of over-riding public interest;
- Present evidence that no other SMP policy option would present an environmentally better, affordable, option for that policy unit;
- Demonstrate that the effect on water bodies outside the SMP study area have been considered and that the associated WFD objective 3 would not be compromised;
- Highlight any other overriding issues that should be considered.

Figure 1 – Water Bodies Associated with the Isle of Grain to South Foreland SMP2

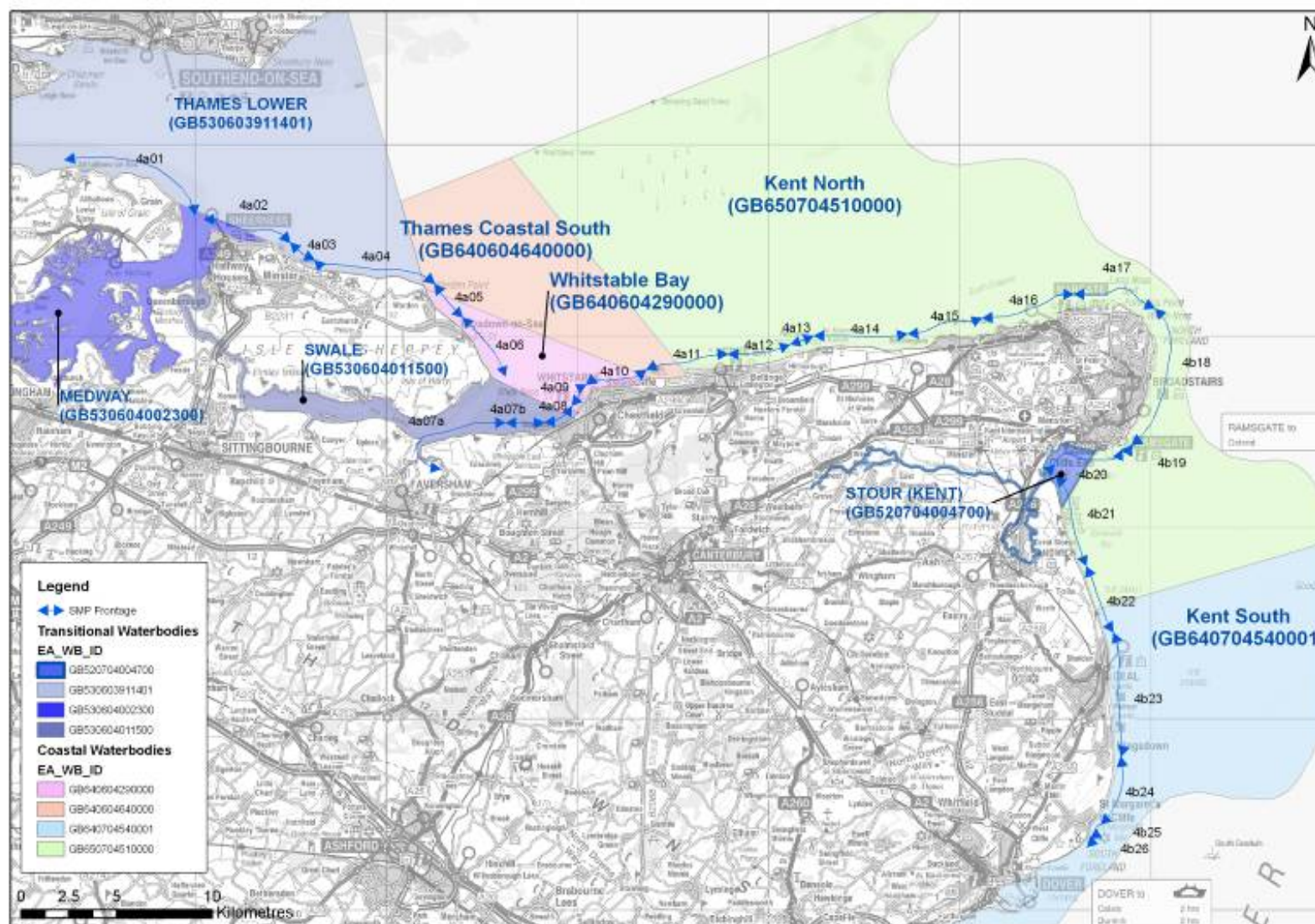
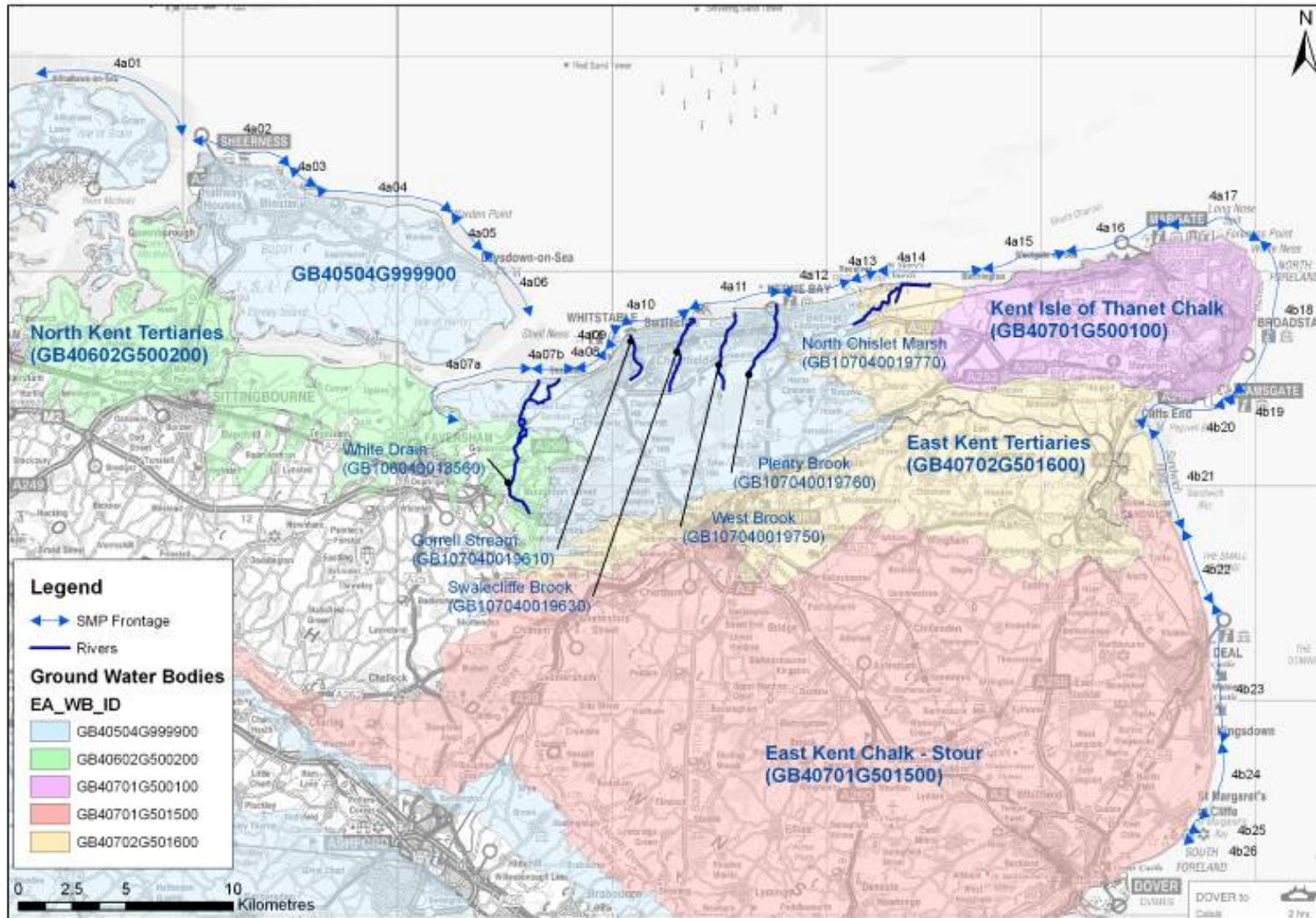


Figure 2 – continued



## 3 Results

### 3.1 *Step 1: Scoping the SMP - Data Collation*

#### 3.1.1 Transitional and Coastal Water Bodies

As indicated in Figure 1, the Isle of Grain to South Foreland SMP2 primarily overlaps two large coastal water bodies, Kent North and Kent South. Policy units 4b20 and 4b21 also encompass the entirety of the shoreline within the transitional water body Stour (Kent), in Pegwell Bay.

There is also some overlap with the coastal water body Thames Coastal South, although this has a very short coastline (part of policy unit 4a11 only), and Whistable Bay, the entire coastline of which is represented by policy units 4a05, 4a06, 4a08 (part), 4a09 and 4a10.

Additionally, the SMP2 overlaps three transitional water bodies in the wider Thames estuary: Thames Lower, Medway and Swale. Overlap with the Medway, however, relates only to the very open northern (seaward) limit of the water body, where the characteristics will be more closely associated with the open Thames Lower transitional water body than with the more constrained Medway transitional water body.

Further details on these water bodies and on their sensitive biological quality elements are presented in **Assessment Table 2**.

#### 3.1.2 River and Lake Water Bodies

A number of river water bodies enter the coast along the north of Kent, whilst on the east coast only the Stour is within the SMP2 study area. These water bodies and the potential for adverse effects on their biological quality elements are identified in **Assessment Table 2**. There are no lake water bodies likely to be affected by the proposed SMP2 policies.

#### 3.1.3 Groundwater Bodies

The groundwater bodies (GWBs) underlying the SMP2 study area and the hinterland associated with the SMP2 frontages are summarised in **Assessment Table 2**. An additional groundwater body (GB40504G999900) which underlies several of the more northerly policy units in the SPM2 is described in the River Basin Management Plans as non-productive strata (formerly termed “non-aquifer”). None of the other GWBs are listed as at risk or potentially at risk from saline intrusion as a result of abstraction.

#### 3.1.4 Boundary Issues

A comparison of the Isle of Grain to South Foreland SMP2 study boundary and the RBMPs for Thames and South East and their associated water bodies has identified a number of boundary discrepancies which might warrant revision of the SMP2.

- Policy unit 4a02 Garrison Point to Minster overlaps two separate water bodies (Medway and Thames Lower). The eastern limit of the policy unit might be moved westwards to correspond with the



water body boundary, thus enlarging the adjacent unit 4a03. Both 4a02 and 4a03 have HTL policies proposed.

- Policy unit 4a08 Seasalter to Whitstable Town (Golf Course) overlaps two separate water bodies (Swale and Whitstable Bay). The eastern limit might be moved westwards to correspond with the water body boundary, and enlarging the adjacent unit 4a09. Both 4a08 and 4a09 have HTL policies proposed.
- Policy unit 4a11 (Swalecliffe to Herne Bay Breakwater) includes the entirety of the coastline in Thames Coastal South, but also extends into Kent North. The policy unit could be split into 4a11A and 4a11B to recognise these two separate overlaps.
- Policy unit 4b22 Sandwich Bay Estate (North) to Sandown Castle (Remains Of) overlaps both Kent North and Kent South water bodies. The southern limit of the policy unit might be moved northwards to correspond with the water body boundary, thus enlarging the adjacent unit 4b23. Both 4b22 and 4b23 have HTL policies proposed.

### 3.2

#### ***Step 2: Define WFD Features and Issues***

**Assessment Table 2** identifies the biological quality elements that could potentially be affected by hydromorphological and physical features in each of the TraC water bodies and river water bodies associated with the SMP2 study area. Where relevant, additional comment is also made on local issues, such as shellfishery or fishery areas, within these water bodies. **Assessment Table 2** also presents the water body classifications and relevant WFD environmental objectives (i.e. WFD1, WFD2, WFD3, WFD4).

#### 3.2.1

##### Transitional and Coastal Water Bodies

The large majority of the Isle of Grain to South Foreland SMP2 shoreline is associated with the open north and east coasts of Kent, and the open southern shoreline of the outer Thames estuary. There are softer coastal deposits in the western extremities of the SMP2 area (Isle of Grain, western Isle of Sheppey), Whitstable and Herne Bay) but for the most part of the coastline is represented by cliffs (mostly chalk) with fronting beaches, with large extents of fronting rock platforms on east Kent in Particular.

However, the SMP2 area does also include the south-eastern shoreline in the constrained Swale transitional water body. Also, as indicated in Section 3.1.1, there are very minor incursions into the Medway transitional water body, but in the most open part that is associated with the Thames Lower water body.

Key issues related to the water bodies' biological quality elements are summarised below.

##### **Thames Lower and Medway Water Bodies**

The western section of the SMP2 coastline is dominated by the Isles of Grain and Sheppey. Much of the coastline between Allhallows-on-Sea and Grain is fronted by extensive inter-tidal mudflats, which are of particular relevance to the water body biological quality elements. The hinterland comprises predominantly low lying agricultural and marsh land, most of

which is undeveloped and is designated for its nature conservation and landscape value.

Towards Grain the topography rises where the London Clay cliffs outcrop. Erosion of these cliffs provides predominantly fine material to the sediment budget. The mouth of the River Medway joins the Thames Estuary between Grain (the Isle of Grain) and Sheerness (the Isle of Sheppey).

Sheerness and Minster dominate the western part of Sheppey and frontages are heavily defended and beaches dependent upon management practises i.e. the presence of groynes. If the current management practises were to cease, it is likely the beach would narrow due to a limited natural sediment supply and material moving alongshore and offshore, rather than forming a 'dynamically functioning' shoreline. Thus, although the intertidal and coastal biological quality elements will be somewhat constrained by the on-going management practices, they are unlikely to benefit if such practises ceased.

Between Minster Slopes and Warden Point, the frontage is relatively undeveloped and undefended. Here the London Clay cliffs are free to erode and provide the sandy foreshore with (fine) sediment.

#### **Whitstable Bay Water Body**

There is justification to maintain some of the current defences at Warden and Leysdown-on-Sea in the long term due to the risk of flooding. However, there will be significant changes to the frontage, including narrower/disappearing beaches along this open coastline.

Leysdown-on-Sea to Shell Ness comprises a managed sand and shell beach, which is backed by low-lying coastal grazing marsh. Under rising sea levels it is anticipated that maintaining the defences and beach will result in long-term coastal squeeze, whereas realignment would create important brackish and saline habitats, which would be likely to result in a better potential for water body biological quality elements than exists now.

#### **Swale Water Body**

The Swale is an 18.4 km channel that separates the Isle of Sheppey from mainland Kent. Its second mouth joins the Thames Estuary at Shell Ness. The Swale is generally constrained between the Kent coast and the Isle of Sheppey. It is a transitional channel with no forming river water body. Generally the Swale frontage is relatively undeveloped.

In addition to the consideration made of WFD biological quality elements, environmental objectives, consideration of designated shellfisheries is required for the main part of the Swale (and north Kent coastline).

#### **Thames Coastal South and Kent North Water Bodies (north Kent coast)**

This section of the SMP2 coast stretches between Faversham Creek and Minnis Bay. The very western extent, Faversham Creek to Seasalter is predominantly low lying agricultural land that is of considerable environmental interest. The hinterland forms part of a single flood cell which if flooded has the potential to inundate a vast amount of land, built assets and strategic links.

Inter-tidal mudflats, of national and international nature conservation importance, front the current defended shoreline in the west, and are

particularly relevant to water body biological quality elements. Eastwards towards Seasalter, the mudflats give way to a small mixed sand and shingle beach, which will be less ecologically significant.

Realignment is possible here as the flood plain is relatively sparsely populated, and there is higher ground to which a secondary defence alignment could be tied into.

Between Seasalter and Bishopstone Manor, the coast is highly developed. Land backing the frontage is predominantly low lying and therefore vulnerable to flooding. Throughout this frontage the beaches fronting the developments are largely formed of relict or imported material, and are heavily managed. There is little alongshore sediment movement to naturally provide beach forming material from one section to another. Biological quality elements will be heavily influenced (constrained) by these characteristics.

Undefined clay coastal slopes, which range between 3 and 15m high characterise the reach between Bishopstone Manor and Reculver Towers. The slopes are prone to minor slope failures and landslides. As there is little in the way of cliff top or indeed hinterland development along this frontage the long term plan is to allow the clay slopes to erode and to continue to provide sediment (fines) to the system. This approach maintains the nature conservation value along this frontage, and will continue the natural supply of sediment to the water body.

East of Reculver Towers the clay slopes give way to low-lying hinterland, most of which is undeveloped and important environmentally. Realignment is possible here as the hinterland is sparsely developed and there are secondary defences already in place and there is higher ground to which a secondary defence alignment could be tied into. This approach will reduce the long term defence requirement by minimising the impact of coastal squeeze on intertidal habitats, thus benefitting the associated biological quality elements.

### **Kent North Water Body (Isle of Thanet)**

The Isle of Thanet forms the boundary between the North Kent (4a) and East Kent (4b) coast. Chalk cliffs dominate this frontage, stretching from Minnis Bay to West Cliff. They are internationally important for their environmental interest. The wave cut chalk shore platform at the base is of regional importance for its marine wildlife, and is the most significant feature for water body biological quality elements.

The frontage is heavily developed and defended in some places (e.g. Margate, Ramsgate) and undeveloped and undefended in others (e.g. White Ness). Where there are defences, this has resulted in the cessation of cliff toe erosion. Conversely where there are no defences, the chalk cliffs are eroding, albeit at a slow rate and supplying a limited amount of beach forming material to the local and downdrift shoreline. However, with rising sea levels the quantities involved (even if not limited by defences) will not be sufficient to offset the effects of rising sea levels and the narrowing of beaches in the long term, with implications for the biological quality elements associated with the wave cut platforms (and beaches).

The towns of Margate, Broadstairs and Ramsgate provide regionally important centres. The existence of beaches along these frontages is dependent upon management practises i.e. the sheltering effect of the

harbour arms, the presence of groynes etc. Were these management practises to cease, it is likely the beach would narrow due to material moving alongshore and offshore, rather than forming a 'dynamically functioning' shoreline. Thus, the biological quality elements will be somewhat constrained by the on-going management practices, but are unlikely to improve if such practises ceased.

### **Kent North and Kent South Water Bodies (east Kent coast)**

This section of the SMP2 coast stretches from Cliffs End in the north to Oldstairs Bay in the south. A large proportion of this frontage is designated for its nature conservation value.

The frontage includes the towns of Sandwich (set back from the coast), Deal and Walmer. This section of the coast is low-lying and derives from 'soft' geologies. As such all assets are at risk from flooding and erosion. The hinterland here forms part of a single flood cell, which if flooded has the potential to inundate and erode up to 11,000 hectares of land including significant towns, infrastructure and industry, as well as large areas of international nature conservation importance.

The fronting coastline has been divided into two morphological forms:

- Cliffs End to Sandwich Bay Estate (north): wide inter-tidal mud and sand flats around the mouth of the River Stour: and,
- Sandwich Bay Estate (north) to Kingsdown: a mixed (shingle and sand) beach, which is presently eroding.

Between Cliffs End and Sandwich Bay Estate the plan is to promote, where possible, a natural functioning coastline. This is mainly driven by the lack of development and the presence of the Pegwell Bay Country Park; a national nature reserve covering some 628 hectares which contains a wide range of valuable habitats: inter-tidal mudflats; saltmarsh; shingle; sand dunes; ancient dune pasture; chalk cliffs; wave cut platform; and coastal scrubland. Due to the sheltering effect of the bay and the natural supply of sediment from updrift, offshore and fluvial sources the shoreline between Cliffs End and Sandwich Bay Estate (north) is not heavily managed.

Between Cliffs End and north of the River Stour the plan is to maintain and /or construct new defences where there is a contamination risk, an economic justification (i.e. Pegwell Road), or where international habitats are at risk.

Between south of the River Stour and Sandwich Bay Estate (north) the largely undeveloped frontage is fronted by accreting sand dunes of international conservation importance. There are no formal defences along this section of the coast as the dunes provide a suitable standard of flood protection.

Between Sandwich Bay Estate (north) and Sandown Castle (remains of) the mixed shingle and sand beach forms the first line of defence. This frontage is linked to the wider flood risk area and considering the number of assets at risk, it is important that the risk remains managed. Therefore the plan is to maintain the line of the defence. A policy of HTL along this section of the coast could result in narrowing of the fronting beach, potentially impacting upon the associated biological quality elements of the water body.



### Kent South Water Body (the white cliffs)

Chalk cliffs form the current shoreline at Oldstairs Bay and continue down to South Foreland. They are internationally important for their environmental interest and the wave cut chalk shore platform at the base is of regional importance for its marine wildlife, and is the main feature relevant to the water body biological quality elements.

The frontage is predominantly undeveloped. Where the chalk cliffs are free to erode, this is at a slow rate and supplies only a limited amount of beach forming material. The quantities involved will not be sufficient to offset the effects of rising sea levels, which will result in narrowing beaches, irrespective of human intervention.

#### 3.2.2 River Water Bodies

Only 6 river water bodies drain directly into any of the Isle of Grain to South Foreland SMP2 policy units. All are considered to be HMWBs (as a result of either flood protection or urbanisation) or AWB. All are classified as moderate or poor potential currently, with no change to a higher class by 2015.

#### 3.2.3 Groundwater Bodies

That part of north Kent around the SMP2 area is underlain by a series of primarily chalk aquifers running approximately east-west. The majority of the coastline itself overlies non-productive strata, and the remaining aquifers are all classified as “not at risk” of saline intrusion.

### **3.3 *Step 3: Assess preferred SMP Policies against WFD environmental objectives***

The potential impacts of SMP policies on WFD environmental objectives have been evaluated and are summarised in **Assessment Table 3**. The potential to meet or fail each of the relevant WFD environmental objectives has been assessed in terms of the effect of the proposed SMP2 policy on the relevant physical and hydromorphological parameters. The relationship between these parameters and the biological quality elements has already been determined in **Assessment Table 2**. The impact of climate change on baseline processes has been taken into account at this stage.

#### 3.3.1 Environmental Objective WFD1

There are no confirmed “high status” coastal, transitional or river water bodies in the SMP2 study area.

#### 3.3.2 Environmental Objective WFD2

##### TrAC Water Bodies

The majority of the policy units in the Isle of Grain to South Foreland SMP2 area do not present a significant risk of deterioration in ecological potential of the associated transitional or coastal water bodies, nor do they present a risk of attaining good potential in these water bodies in the future. This conclusion is expanded on below.

Where the SMP2 policy is NAI or to implement (some) MR this is in line with the mitigation measures identified in the Thames and South East RBMPs as necessary to allow the modified water bodies to achieve good

potential (see Assessment Table 2 for details on these mitigation measures). Although these mitigation measures have not been screened in the RBMP development process for technical feasibility or disproportionate cost, they do present aspirations and the SMP2 policies for MR present opportunities to contribute to these in each case. Therefore, the SMP2 policies proposed for policy units 4a01, 4a04, 4a06, 4a07A, 4a07B, 4a13, 4a14, 4a15, 4a17, 4b18, 4b20, 4b21, 4b24 and 4b26 do not threaten WFD2.

Further policy units have a proposed HTL policy but this is not considered to present a significant risk of deterioration in potential or failure to meet good potential in the future, for one or more reasons:

- The policy unit frontage is very short and/or totally artificial (4a02, 4b19, 4b25);
- Coastal processes are not dynamic, and maintaining the shoreline position through HTL will make no significant difference to these processes (4a02, 4b25);
- Although HTL policy could promote future coastal squeeze as sea levels rise, there are some areas where natural coastal squeeze would be seen anyway, as the rate of sea level rise is expected to outpace the supply of beach materials at the toe of the cliffs (4a16).

The remaining policy units where HTL policy is preferred are 4a03, 4a08 to 4a12 inclusive, 4b22 and 4b23. In these instances, some coastal squeeze and / or accelerated erosion is likely, particularly in longer term epochs, with the potential to contribute to a **failure to meet WFD environmental objective 2**.

Each of these policy units has therefore been examined further to establish the justification for HTL (see **Assessment Table 4**):

- The SMP2 makes generic comments about mitigation measures but does not include specific and detailed mitigation measures for each policy unit as no outline designs have yet been proposed; the potential mitigation measures from the Thames and South East RBMPs have been included in Assessment Table 4;
- The SMP2 has demonstrated overriding public interest in each case;
- In no policy unit is there an environmentally better option which would meet the required public interest;
- None of the policies would have significant effect on another water body (as needs to be assessed under Articles 4.8 of the WFD<sup>(4)</sup>);
- An Appropriate Assessment undertaken by Natural England and Canterbury City Council is reported in SMP2 Appendix J. It concluded that it is not possible to demonstrate that MR policies would not have an adverse effect on the integrity of the Thames Estuary and Marshes and The Swale SPA / Ramsar sites through

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<sup>(4)</sup> Article 4.8 requires assessment of whether the proposed action will present a risk to the objectives of other water bodies, e.g. those adjacent to the one in which a scheme is being implemented, and assessment to ensure compliance with other community legislation, e.g. the Habitats Directive.

displacement of Grazing Marsh and Standing Water habitats. Therefore, appropriate compensatory measures (alternative habitat creation) have been included as an integral part of the SMP2.

Thus, where there are policies proposed in the SMP2 which present a risk of not meeting WFD2, they are all considered to meet the criteria laid down in Article 4.7 of the WFD (see Section 2.4 for details) and thus to be in accordance with the Directive's objectives or, in the case of European designated nature conservation sites, to have been suitably considered under alternative European Directives.

#### River Water Bodies

Relatively few river water bodies are associated with the study area, all located along the northern coast and associated with only four SMP2 policy units: 4a07B, 4a10, 4a11 and 4a14.

The proposed policies for 4a07A and 4a14 are a gradual transition towards MR, which will promote natural conditions for the biological quality elements in the river water bodies which are, actually, areas of marshland. Thus the proposed policies will increase the opportunities to achieve good potential in these river water bodies in the future.

All other river water bodies are located within HTL policy frontages. Whilst maintaining an artificial shoreline position might generally be considered to be an adverse pressure, by preventing a natural saltwater-freshwater transition to develop, there are particular circumstances for these water bodies which need to be considered, i.e.:

- Gorrell Stream (4a10) through Whitstable and Plenty Brook (4a11) through Herne Bay are both extensively culverted and this is a much more significant hydromorphological pressure than beach maintenance. Therefore, the proposed HTL policy would only risk good potential not being attained in the future if the culverts were removed and natural channels restored. Given that the areas are heavily urbanised, this is not feasible;
- Swalecliffe Brook (4a10) discharges over the shingle beach in the east of Whitstable. Under high tide conditions it can become tide locked, and hence the brook has a floodplain associated with a major meander behind the beach. Otherwise, there is effectively no saltwater-freshwater interface, and the HTL policy is considered to have no significant consequences for the brook's biological elements.

West Brook (4a11) is associated with HTL policy. The brook is largely open channel but is culverted under the beach, and presumed here to have a flapped outfall. Since HTL policy will maintain this culvert, the brook is potentially at risk of failing to achieve good potential in the future due to the prevention of tidal exchange.

### 3.3.3

#### Environmental Objective WFD3

None of the proposed policies in the SMP2 are considered to present the potential to contribute to a failure in WFD3, i.e. to cause changes which would permanently prevent the environmental objectives of other water bodies being met.

MR and NAI policies could result in a change in the land areas that are tidally inundated. Although the actual areas of tidal inundation have not been mapped as part of the SMP2, only two of the policy units are located on coastal frontages or hinterlands which overlie a source protection zone:

- Policy unit 4b20 extends along the frontage of the Stour (Kent) (GB520704004700) transitional water body, and there is a source protection zone extending to the shoreline at Cliffs End. The SMP2 policy for 4b20 is HTL except in areas where there are no defences, where NAI is proposed.
- Policy unit 4b26 extends along the frontage past Deal, Kingsdown and St Margaret's Cliffe. A series of linked source protection zones extend along the same area, although they do not extend as far as the present-day coastline. The proposed policy is NAI.

The likelihood of the NAI policies in these areas resulting in saline incursion into groundwater bodies is extremely small, given the distance that the coastline would have to advance before reaching the source protection zones. Additionally, the groundwater bodies in both areas have been identified in the South East RBMP as “not at risk” of saline intrusion as a result of abstraction. Finally, as indicated in Section 2.3, it is considered that if a coastal system changes due to a return to more natural conditions, any consequent saline intrusion of the underlying groundwater would not result in a Poor Status classification.

### 3.4

#### ***Step 4: Complete WFD summary statement***

A summary of water bodies achievement (or otherwise) of the WFD environmental objective is presented in **Assessment Table 4**. Where any WFD environmental objective is at risk of not being met *for any SMP2 policy unit*, a WFD summary statement is included in **Assessment Table 5**.

## 4

# Discussion and Conclusions

There are no “high” status coastal or transitional water bodies in the SMP2 study area, and therefore **WFD environmental objective 1 does not apply**. In fact, all of the relevant transitional, coastal and river water bodies are Heavily Modified, and therefore only ecological potential applies.

The majority of the policies proposed in the SMP2 do not present a notable risk of deterioration in ecological potential of the associated transitional or coastal water bodies, nor do they present a risk of them failing to achieve at least good potential in the future.

Indeed, some of the proposed policies directly support the likely mitigation measures identified in the RBMP as required to achieve at least good potential in modified water bodies (see Table 4.1). Therefore **WFD environmental objective 2 will be met for the majority of the SMP2 policy units**. The **exceptions** are where HTL policy is proposed and could promote coastal squeeze or sustain biologically undesirable stability where erosion and material transport would promote more natural conditions for water body biological quality elements. The policy units in question are along the northern coasts of the Isle of Sheppey (4a03) and Kent (4a08, 4a09, 4a10, 4a11, 4a12) and the middle of the eastern Kent coast (4b22, 4b23)<sup>(5)</sup>. In these instances, some coastal squeeze and / or accelerated erosion is likely, particularly in longer term epochs. However, **the preferred policies pass all WFD Article 4.7 tests**, although some mitigation measures need to be expanded upon as the proposed SMP2 policies are progressed into projects / schemes.

Relatively few river water bodies are associated with the study area, all located along the northern coast and associated with only four SMP2 policy units: 4a07B, 4a10, 4a11 and 4a14. The proposed policies for 4a07A and 4a14 are a gradual transition towards MR, which will promote natural conditions for the biological quality elements in the river water bodies which are, actually, areas of marshland. HTL policies in 4a10 and 4a11 will not be significant for two river water bodies (Gorrell Brook and Plenty Brook) since they are extensively culverted and this is a much more significant hydromorphological pressure than beach maintenance. A third river water body (Swalecliffe Brook) is unlikely to be significantly influenced by HTL, whereas the fourth (West Brook) could potentially be at risk of failing to achieve good potential in the future due to its culverted (and presumably flapped) outfall under the beach being maintained.

As indicated in Assessment Table 3 for each of the policy units in turn, those SMP2 policies which will modify coastal (or estuarine) processes will only do so in localised areas. There will be some constraint on alongshore movement of eroded material in some instances, but since in most cases the rates of erosion and movement are naturally low, this effect is unlikely to

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<sup>(5)</sup> In some other areas, notably along the east coast of Kent, HTL is proposed and will promote coastal squeeze, but since natural erosion processes would anyway be slow then natural coastal squeeze would arise anyway as a result of sea level rise. Thus, the proposed policy is not considered to have significant consequences for biological quality elements

extend into an adjacent water body. Considering this jointly with the assessment of river water bodies above, **WFD environmental objective 3 will be met.** An Appropriate Assessment undertaken by Natural England and Canterbury City Council is reported in SMP2 Appendix J. It concluded coastal squeeze and potential loss of chalk reef habitat in the Thanet Coast and Sandwich Bay SPA and Ramsar site was a natural process, not influenced by HTL policy, but also that it is not possible to demonstrate that MR policies would not have an adverse effect on the integrity of the Thames Estuary and Marshes and The Swale SPA / Ramsar sites through displacement of grazing marsh and standing water habitats. Therefore, appropriate compensatory measures (alternative habitat creation) have been included as an integral part of the SMP2.

None of the MR or NAI policies will result in a significant risk of saltwater overlying a groundwater SPZ. Furthermore, none of the groundwater bodies in the SMP2 study area are considered to be at risk of saline intrusion as a result of abstraction, which could make it more vulnerable to further saline risk. Thus, any change in groundwater quality as a result of movement of the coastline is considered a return to more natural conditions without any adverse effects on underlying groundwater bodies. Therefore, **WFD environmental objective 4 will be met.**

It is suggested that a number of the SMP2 policy unit boundaries might be relocated to align them with water body boundaries. In each case, the adjacent SMP2 policy units that would be decreased or enlarged, respectively, share the same proposal policies in each SMP2 epoch.

The SMP2 presents opportunities to deliver good ecological potential in the Thames Lower, Whitstable Bay, Swale and Kent North water bodies in particular through contribution to the following RBMP proposed mitigation measures:

- Managed realignment of flood defence (Whitstable Bay, Swale, Kent North);
- Preserve and, where possible, restore historic aquatic habitats (Whitstable Bay, Swale, Kent North);
- Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution (Whitstable Bay, Swale, Kent North);
- Bank rehabilitation / reprofiling (Whitstable Bay, Swale);
- Indirect / offsite mitigation (offsetting measures) (Whitstable Bay);
- Operational and structural changes to locks, sluices, weirs, beach control, etc (Whitstable Bay);
- Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone (Whitstable Bay);
- Remove obsolete structure (Whitstable Bay).

No programme of measures has yet been identified in the Thames RBMP for the Thames Lower transitional water body, but any of the measures indicated above could be relevant.

The policy areas that are most likely to contribute to achievement of good potential in the associated water bodies are summarised in Table 4.1.

**Table 4.1 – Policies Proposed in the SMP2 Which May Contribute to Water Framework Directive Hydromorphological Objectives**

<b>Water body</b>	<b>SMP2 Policy Unit (and Indicative NGR)</b>	<b>Policy Contribution to WFD Objectives</b>
<b>Thames Lower GB530603911401</b>	4a01 - Allhallows-on-Sea to Grain (TQ 869 783)	MR policy will allow development of a more naturally functioning shoreline and intertidal zone.  Increased range and diversity of intertidal habitats will support an improvement in biological quality elements
<b>Whitstable Bay GB640604290000</b>	4a05 - Warden Point to Leysdown-on-Sea (TR 027 713)  4a06 - Leysdown-on-Sea to Shell Ness (TR 046 693)	MR policies will allow development of a more naturally functioning shoreline and intertidal zone.  Increased range and diversity of intertidal habitats will support an improvement in biological quality elements
<b>Swale GB530604011500</b>	4a07A – Faversham Creek to the Sportsman Pub (TR 033 647)  4a07B - The Sportsman Pub to Seasalter (TR 073 650)	MR policies will allow development of a more naturally functioning shoreline and intertidal zone.  Increased range and diversity of intertidal habitats will support an improvement in biological quality elements
<b>Kent North GB65070451000</b>	4a14 - Reculver Towers to Minnis Bay (TR 247 694)	MR policy will allow development of a more naturally functioning shoreline and intertidal zone.  Increased range and diversity of intertidal habitats will support an improvement in biological quality elements

WFD Assessment Table 2 – Water Body Classifications

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
<b>TrAC Water Bodies</b>				
<b>Thames Lower</b> <b>GB530603911401</b> <b>(Transitional)</b> <b>(4a01, 4a02, 4a03, 4a04)</b>	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated with velocity)	<b>Classification: Moderate Potential (HMWB)</b> <b>Predicted ecological quality 2015: Moderate Potential</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	Measures from Annex B of the Thames RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding measures specific to maritime navigation and associated channel maintenance / dredging etc): <ul style="list-style-type: none"> <li>Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works.</li> <li>Managed realignment of flood defence</li> <li>Bank rehabilitation / reprofiling</li> <li>Increase in-channel morphological diversity</li> <li>Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> <li>Remove obsolete structure</li> </ul> Physical Measures from Annex C of the Thames RBMP and potentially relevant: <ul style="list-style-type: none"> <li>TH0193 - Improved access and habitat for eels, installation of eel/elver passes, assessment of need for passes/other action at obstructions, development and installation of passage at tidal gates/hatches</li> </ul>
	Angiosperms	Thames Lower is currently High Status for macroalgae Potential changes to angiosperms through changes in: land elevation; inundations (tidal regime); abrasion (associated with increased velocities); and potentially sediment loading		
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the beach water table (potentially constraining vertical distribution up the beach)  The "Southend" shellfish water extends to the south coast of the Thames estuary in the Thames Lower water body, potentially relevant to 4a01. Thames Lower also overlaps the "Sheppey" shellfish water, potentially relevant to 4a02, 4a03, 4a04  Thames Lower is currently Moderate Status for invertebrates.		
	Fish	Potential changes to fish through: heterogeneity of habitat (changes in substrate, provision of shelter); continuity for migration routes; substrate conditions; accessibility to nursery areas (elevation of saltmarshes, connectivity with shoreline).		
<b>Medway</b> <b>GB530604002300</b> <b>(Transitional)</b> <b>(4a02)</b>	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated with velocity)  Medway is currently Moderate Status for macroalgae – with opportunistic growth in the sheltered soft sediment areas, bordering between "natural" and "excessive". A reduction in the amount of opportunistic macroalgae would be considered as an improvement in Water Body condition	<b>Classification: Moderate Potential (HMWB)</b> <b>Predicted ecological quality 2015: Moderate Potential</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	Measures from Annex B of the Thames RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding those specific to maritime navigation and associated channel maintenance / dredging etc): <ul style="list-style-type: none"> <li>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works.</li> <li>Indirect / offsite mitigation (offsetting measures)</li> <li>Operational and structural changes to locks, sluices, weirs, beach control,</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>Managed realignment of flood defence</li> <li>Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> <li>Remove obsolete structure</li> </ul> Physical Measures from Annex C of the Thames RBMP and potentially relevant: <ul style="list-style-type: none"> <li>TH0193 - Improved access and habitat for eels, installation of eel/elver passes, assessment of need for passes/other action at obstructions, development and installation of passage at tidal gates/hatches</li> </ul>
	Angiosperms	Potential changes to angiosperms through changes in: land elevation; inundations (tidal regime); abrasion (associated with increased velocities); and potentially sediment loading		
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the beach water table (potentially constraining vertical distribution up the beach)  Medway is currently Moderate Status for invertebrates.		
	Fish	Potential changes to fish through: heterogeneity of habitat (changes in substrate, provision of shelter); continuity for migration routes; substrate conditions; accessibility to nursery areas (elevation of saltmarshes, connectivity with shoreline)  A Freshwater Fish designation applies to the upstream river, with a potential for migratory fish to use the associated transitional water body		



Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
<b>Thames Coastal South</b> <b>GB640604640000</b> <b>(Coastal)</b> <b>(4a11)</b>	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated with velocity)	<b>Classification: Poor Potential (HMWB)</b> <b>Predicted ecological quality 2015: Moderate Potential</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	Heavily modified by coastal protection.  Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation: <ul style="list-style-type: none"> <li>Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>Preserve and, where possible, restore historic aquatic habitats</li> </ul> Physical Measures from Annex C of the South East RBMP and potentially relevant: <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
	Angiosperms	Potential changes to angiosperms through changes in: land elevation; inundations (tidal regime); and possibly alongshore abrasion (associated with increased velocities) and sediment loading  Thames Coastal South is currently Poor Status for phytoplankton.		
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the beach water table (potentially constraining vertical distribution up the beach)  Thames Coastal South overlaps the "Whitstable" shellfish water, potentially relevant to 4a11.		
<b>Whitstable Bay</b> <b>GB640604290000</b> <b>(Coastal)</b> <b>(4a05, 4a06, 4a08, 4a09, 4a10)</b>	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated with velocity)	<b>Classification: Moderate Potential (HMWB)</b> <b>Predicted ecological quality 2015: Moderate Potential</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	Heavily modified by coastal protection.  Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding measures specific to maritime navigation and associated channel maintenance / dredging etc): <ul style="list-style-type: none"> <li>Indirect / offsite mitigation (offsetting measures)</li> <li>Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>Managed realignment of flood defence</li> <li>Bank rehabilitation / reprofiling</li> <li>Preserve and, where possible, restore historic aquatic habitats</li> <li>Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> <li>Remove obsolete structure</li> </ul> Physical Measures from Annex C of the South East RBMP and potentially relevant: <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
	Angiosperms	Potential changes to angiosperms through changes in: land elevation; inundations (tidal regime); and possibly alongshore abrasion (associated with increased velocities) and sediment loading		
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the beach water table (potentially constraining vertical distribution up the beach)  Whitstable Bay is currently Good Status for invertebrates.  The water body overlaps the "Sheppey" shellfish water, potentially relevant to 4a05, 4a06 and also the "Swale East" shellfish water (cockle, oyster and mussel), potentially relevant to 4a06, 4a08, 4a09, 4a10		
<b>Swale</b> <b>GB530604011500</b> <b>(Transitional)</b> <b>(4a07A, 4a07B, 4a08)</b>	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated with velocity)  Swale is currently Moderate Status for macroalgae - some areas of opportunistic growth in sheltered soft sediment areas are bordering between "natural" and "excessive". A reduction in the amount of opportunistic macroalgae would be considered as an improvement in Water Body condition	<b>Classification: Moderate Potential (HMWB)</b> <b>Predicted ecological quality 2015: Moderate Potential</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or</li> </ul>	Measures from Annex B of the Thames RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, (related to the HMWB designation: <ul style="list-style-type: none"> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>Managed realignment of flood defence</li> <li>Bank rehabilitation / reprofiling</li> </ul>

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
	Angiosperms	Potential changes to angiosperms through changes in: land elevation; inundations (tidal regime); abrasion (associated with increased velocities); and potentially sediment loading	<p>result in a deterioration of surface water Ecological Status or Potential.</p> <ul style="list-style-type: none"> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<ul style="list-style-type: none"> <li>Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> </ul> <p>Physical Measures from Annex C of the Thames RBMP and potentially relevant:</p> <ul style="list-style-type: none"> <li>TH0193 - Improved access and habitat for eels, installation of eel/elver passes, assessment of need for passes/other action at obstructions, development and installation of passage at tidal gates/hatches</li> </ul>
	Benthic / macro invertebrates	<p>Potential changes to benthic / macro invertebrates through changes in the beach water table (potentially constraining vertical distribution up the beach)</p> <p>There is a shellfish water (cockle, oyster and mussel) at "Swale East", potentially relevant to 4a07A, 4a07B, 4a08.</p>		
	Fish	Potential changes to fish through: heterogeneity of habitat (changes in substrate, provision of shelter); continuity for migration routes; substrate conditions; accessibility to nursery areas (elevation of saltmarshes, connectivity with shoreline)		
<b>Kent North</b> <b>GB65070451000</b> <b>(Coastal)</b> <b>(4a11, 4a12, 4a13, 4a14, 4a15, 4a16, 4a17, 4b18, 4b19, 4b20, 4b21, 4b22)</b>	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated with velocity)	<p><b>Classification: Moderate Potential (HMWB)</b></p> <p><b>Predicted ecological quality 2015: Moderate Potential</b></p> <p>Environmental objectives:</p> <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<p>Heavily modified by coastal protection.</p> <p>Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding measures specific to maritime navigation and associated channel maintenance / dredging etc):</p> <ul style="list-style-type: none"> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>Managed realignment of flood defence</li> <li>Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> </ul> <p>Physical Measures from Annex C of the South East RBMP and potentially relevant:</p> <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
	Angiosperms	<p>Potential changes to angiosperms through changes in: land elevation; inundations (tidal regime); and possibly alongshore abrasion (associated with increased velocities) and sediment loading</p>		
	Benthic / macro invertebrates	<p>Potential changes to benthic / macro invertebrates through changes in the beach water table (potentially constraining vertical distribution up the beach)</p> <p>Kent North is currently Good Status for invertebrates</p> <p>The water body overlaps the "Whitstable" and "Margate" shellfish waters (potentially relevant to 4a11, 4a12, 4a13, 4a14 (part) and to 4a14 (part), 4a15, 4a16, 4a17, respectively)</p>		
	Fish	Potential changes to fish through: heterogeneity of habitat (changes in substrate, provision of shelter); substrate conditions; accessibility to nursery areas (connectivity with shoreline)		
<b>Stour (Kent)</b> <b>GB520704004700</b> <b>(Transitional)</b> <b>(4b20, 4b21)</b>	Macroalgae	<p>Pegwell Bay - potential changes to macroalgae through changes in abrasion (associated with velocity)</p> <p>Tidal river - potential changes to macrophytes through changes in: light quality/quantity; episodicity of flows and inundation; and turbidity; all of which could affect longitudinal position</p>	<p><b>Classification: Moderate Potential (HMWB)</b></p> <p><b>Predicted ecological quality 2015: Moderate Potential</b></p> <p>Environmental objectives:</p> <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<p>Heavily modified by flood protection.</p> <p>Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation:</p> <ul style="list-style-type: none"> <li>Indirect / offsite mitigation (offsetting measures)</li> <li>Retain marginal aquatic and riparian habitats (channel alteration)</li> <li>Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works.</li> <li>Managed realignment of flood defence</li> <li>Increase in-channel morphological diversity</li> <li>Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> </ul> <p>Physical Measures from Annex C of the South East RBMP and</p>
	Angiosperms	Pegwell Bay – potential changes to angiosperms through changes in: land elevation; inundations (tidal regime); abrasion (associated with increased velocities); and potentially sediment loading		
	Benthic / macro invertebrates	<p>Pegwell Bay - potential changes to benthic / macro invertebrates through changes in the beach water table (potentially constraining vertical distribution up the beach)</p> <p>The "Pegwell Bay" shellfish water (cockles and oysters) is potentially relevant to 4b20 and 4b21</p> <p>Tidal river - potential changes to benthic / macro invertebrates through changes in the position of the saline-freshwater interface (and associated conditions of light, turbidity and salinity) within the river</p>		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
	Fish	<p>Pegwell Bay - potential changes to fish through: heterogeneity of habitat (changes in substrate, provision of shelter); continuity for migration routes; substrate conditions; accessibility to nursery areas (elevation of saltmarshes, connectivity with shoreline)</p> <p>Tidal river - potential changes to fish through changes in: continuity of migration routes; substrate conditions; accessibility of nursery areas. A Freshwater Fish designation applies to the upstream river, with a potential for migratory fish to use the associated transitional water body.</p>		<p>potentially relevant:</p> <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
<b>Kent South</b> <b>GB640704540001</b> <b>(Coastal)</b> <b>(4b22, 4b23, 4b24, 4b25, 4b26)</b>	Macroalgae	<p>Potential changes to macroalgae through changes in abrasion (associated with velocity)</p> <p>Kent South currently has Good Status for macroalgae</p>	<p><b>Classification: Moderate Potential (HMWB)</b></p> <p><b>Predicted ecological quality 2015: Good Potential</b></p> <p>Environmental objectives:</p> <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<p>Heavily modified by coastal protection.</p> <p>Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding those related to maritime navigation and associated channel maintenance / dredging etc):</p> <ul style="list-style-type: none"> <li>Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>Preserve and, where possible, restore historic aquatic habitats</li> </ul>
	Angiosperms	<p>Potential changes to angiosperms through changes in: land elevation; inundations (tidal regime); and possibly alongshore abrasion (associated with increased velocities) and sediment loading</p>		
	Benthic / macro invertebrates	<p>Potential changes to benthic / macro invertebrates through changes in the beach water table (potentially constraining vertical distribution up the beach)</p> <p>Kent South currently has Good Status for invertebrates</p>		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
	Fish	Potential changes to fish through: heterogeneity of habitat (changes in substrate, provision of shelter); substrate conditions; accessibility to nursery areas (connectivity with shoreline)		Physical Measures from Annex C of the South East RBMP and potentially relevant: <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
<b>River Water Bodies</b>				
<b>White Drain GB106040018560 (4a07B)</b>	Macrophytes	Potential changes to macrophytes through changes in: light quality/quantity; episodicity of flows and inundation; and turbidity; all of which could affect longitudinal position	<b>Classification: Poor Potential (HMWB - flood protection)</b> <b>Predicted ecological quality 2015: Poor Potential</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or</li> </ul>	Measures from Annex B of the Thames RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding measures not related to water body hydromorphology): <ul style="list-style-type: none"> <li>Retain marginal aquatic and riparian habitats (channel alteration)</li> <li>Operational and structural changes to locks, sluices, weirs,</li> </ul>
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the position of the saline-freshwater interface (and associated conditions of light, turbidity and salinity) within the river		



Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
	Fish	Potential changes to fish through changes in: continuity of migration routes; substrate conditions; accessibility of nursery areas	<p>result in a deterioration of surface water Ecological Status or Potential.</p> <ul style="list-style-type: none"> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<p>beach control, etc</p> <ul style="list-style-type: none"> <li>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works.</li> <li>Improve floodplain connectivity</li> <li>Set-back embankments</li> <li>Flood bunds (earth banks, in place of floodwalls)</li> <li>Increase in-channel morphological diversity</li> </ul> <p>Physical Measures from Annex C of the Thames RBMP and potentially relevant:</p> <ul style="list-style-type: none"> <li>TH0033 - Continue to develop and implement a programme of river habitat improvement works to improve ecology by addressing physical morphology and flow pressures (including culverts, closed watercourses, pinch points and inchannel structures)</li> <li>TH0193 - Improved access and habitat for eels, installation of eel/elfer passes, assessment of need for passes/other action at obstructions, development and installation of passage at tidal gates/hatches</li> </ul>
Gorrell Stream GB107040019610 (4a10)	Macrophytes	Potential changes to macrophytes through changes in: light quality/quantity; episodicity of flows and inundation; and turbidity; all of which could affect longitudinal position	<p><b>Classification: Moderate Potential (HMWB - flood protection)</b></p> <p><b>Predicted ecological quality 2015: Moderate Potential</b></p> <p>Environmental objectives:</p> <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<p>Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding measures not related to water body hydromorphology):</p> <ul style="list-style-type: none"> <li>Retain marginal aquatic and riparian habitats (channel alteration)</li> <li>Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works</li> <li>Increase in-channel morphological diversity</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> </ul> <p>Physical Measures from Annex C of the South East RBMP and potentially relevant:</p> <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the position of the saline-freshwater interface (and associated conditions of light, turbidity and salinity) within the river		
	Fish	Potential changes to fish through changes in: continuity of migration routes; substrate conditions; accessibility of nursery areas		
Swalecliffe Brook GB107040019630 (4a10)	Macrophytes	Potential changes to macrophytes through changes in: light quality/quantity; episodicity of flows and inundation; and turbidity; all of which could affect longitudinal position	<p><b>Classification: Moderate Potential (HMWB - flood protection)</b></p> <p><b>Predicted ecological quality 2015: Moderate Potential</b></p> <p>Environmental objectives:</p> <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet</li> </ul>	<p>Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding measures not related to water body hydromorphology):</p> <ul style="list-style-type: none"> <li>Retain marginal aquatic and riparian habitats (channel alteration)</li> <li>Operational and structural changes to locks, sluices, weirs,</li> </ul>
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the position of the saline-freshwater interface (and associated conditions of light, turbidity and salinity) within the river		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
	Fish	Potential changes to fish through changes in: continuity of migration routes; substrate conditions; accessibility of nursery areas	<p>surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</p> <ul style="list-style-type: none"> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<p>beach control, etc</p> <ul style="list-style-type: none"> <li>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works</li> <li>Increase in-channel morphological diversity</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> </ul> <p>Physical Measures from Annex C of the South East RBMP and potentially relevant:</p> <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
<b>West Brook</b> <b>GB107040019750</b> <b>(4a11)</b>	Macrophytes	Potential changes to macrophytes through changes in: light quality/quantity; episodicity of flows and inundation; and turbidity; all of which could affect longitudinal position	<p><b>Classification: Moderate Potential (HMWB - flood protection)</b></p> <p><b>Predicted ecological quality 2015: Moderate Potential</b></p> <p>Environmental objectives:</p> <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<p>Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding measures not related to water body hydromorphology):</p> <ul style="list-style-type: none"> <li>Retain marginal aquatic and riparian habitats (channel alteration)</li> <li>Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works</li> <li>Increase in-channel morphological diversity</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> </ul> <p>Physical Measures from Annex C of the South East RBMP and potentially relevant:</p> <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the position of the saline-freshwater interface (and associated conditions of light, turbidity and salinity) within the river		
	Fish	Potential changes to fish through changes in: continuity of migration routes; substrate conditions; accessibility of nursery areas		
<b>Plenty Brook</b> <b>GB107040019760</b> <b>(4a11)</b>	Macrophytes	Potential changes to macrophytes through changes in: light quality/quantity; episodicity of flows and inundation; and turbidity; all of which could affect longitudinal position	<p><b>Classification: Moderate Potential (HMWB - urbanisation)</b></p> <p><b>Predicted ecological quality 2015: Moderate Potential</b></p> <p>Environmental objectives:</p> <ul style="list-style-type: none"> <li>WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	<p>Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the HMWB designation (excluding measures not related to water body hydromorphology):</p> <ul style="list-style-type: none"> <li>Retain marginal aquatic and riparian habitats (channel alteration)</li> <li>Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works</li> <li>Increase in-channel morphological diversity</li> <li>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> </ul> <p>Physical Measures from Annex C of the South East RBMP and potentially relevant:</p> <ul style="list-style-type: none"> <li>SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the position of the saline-freshwater interface (and associated conditions of light, turbidity and salinity) within the river		
	Fish	Potential changes to fish through changes in: continuity of migration routes; substrate conditions; accessibility of nursery areas		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
North Chislet Marsh GB107040019770 (4a14)	Macrophytes	Potential changes to macrophytes through changes in: light quality/quantity; episodicity of flows and inundation; and turbidity; all of which could affect longitudinal position	<b>Classification: Bad Potential (AWB)</b> <b>Predicted ecological quality 2015: Bad Potential</b> Environmental objectives: <ul style="list-style-type: none"> <li>▪ WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</li> <li>▪ WFD3: No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.</li> </ul>	Measures from Annex B of the South East RBMP that could be considered in schemes resulting from SMP2 policies are indicated below, related to the AWB designation (excluding measures not related to water body hydromorphology): <ul style="list-style-type: none"> <li>• Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>• Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> <li>• Preserve and, where possible, restore historic aquatic habitats</li> <li>• Re-opening existing culverts</li> <li>• Alteration of channel bed (within culvert)</li> <li>• Increase in-channel morphological diversity</li> <li>• Flood bunds (earth banks, in place of floodwalls)</li> <li>• Set-back embankments</li> <li>• Improve floodplain connectivity</li> <li>• Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works</li> <li>• Remove obsolete structure</li> <li>• Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>• Retain marginal aquatic and riparian habitats (channel alteration)</li> </ul> Physical Measures from Annex C of the South East RBMP and potentially relevant: <ul style="list-style-type: none"> <li>• SE0131 - Flood/Coastal Erosion Risk Management Measure Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>• SE0135 - Flood/Coastal Erosion Risk Management Measure - Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> <li>• SE0141 - Flood/Coastal Erosion Risk Management Measure Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works</li> <li>• SE0282 - reduce the physical impacts of flood risk management activities in artificial or heavily modified water bodies</li> </ul>
	Benthic / macro invertebrates	Potential changes to benthic / macro invertebrates through changes in the position of the saline-freshwater interface (and associated conditions of light, turbidity and salinity) within the river		
	Fish	Potential changes to fish through changes in: continuity of migration routes; substrate conditions; accessibility of nursery areas		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures &/or recommendations on preferred policy (see text Section 2.2)
Water body (including policy units that affect it)	Biological Quality Element	Potential for change in hydro-morphological or physical parameter		
<b>Groundwater Bodies</b>				
<b>North Kent Tertiaries GB40602G500200 (4a07A)</b>		This SMP2 policy unit does not present a risk of overlapping any Source Protection Zone associated with this groundwater body.	<b>Classification: Good Status for saline intrusion</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration in groundwater status</li> </ul>	The Programme of Measures from the RBMP has <b>no proposals for ground water bodies</b> that could be considered in schemes resulting from SMP2 policies
<b>East Kent Tertiaries GB40702G501600 (4a13, 4a14, 4b20, 4b21)</b>		None of these SMP2 policy units presents a risk of overlapping a Source Protection Zone associated with this groundwater body.	<b>Classification: Good Status for saline intrusion</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration in groundwater status</li> </ul>	The Programme of Measures from the RBMP has <b>no proposals for ground water bodies</b> that could be considered in schemes resulting from SMP2 policies
<b>Kent Isle of Thanet Chalk GB40701G500100 (4a14, 4a15, 4a16, 4a17, 4b18, 4b19, 4b20)</b>		Only 4b20 presents a risk of overlapping a Source Protection Zone associated with this groundwater body. However, as indicated in the text, there is considered to be no risk of the SMP2 policy of HTL plus NAI resulting in deterioration of groundwater Status or failure to achieve Good Status in the future.	<b>Classification: Good Status for saline intrusion</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration in groundwater status</li> </ul>	The Programme of Measures from the RBMP has <b>no proposals for ground water bodies</b> that could be considered in schemes resulting from SMP2 policies
<b>East Kent Chalk (Stour) GB40701G501500 (4b21, 4b22, 4b23, 4b24, 4b25, 4b26)</b>		Only 4b26 presents a risk of overlapping a Source Protection Zone associated with this groundwater body. However, as indicated in the text, there is considered to be no risk of the SMP2 policy of NAI resulting in deterioration of groundwater Status or failure to achieve Good Status in the future.	<b>Classification: Good Status for saline intrusion</b> Environmental objectives: <ul style="list-style-type: none"> <li>WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration in groundwater status</li> </ul>	The Programme of Measures from the RBMP has <b>no proposals for ground water bodies</b> that could be considered in schemes resulting from SMP2 policies



WFD Assessment Table 3 - Assessment of SMP Policy Against the WFD Environmental Objectives

Policy Unit		SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)			
		2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
4a01	Allhallows-on-Sea to Grain	HTL	MR	MR	<p><b>Transitional - Thames Lower</b></p> <p>In the short term the plan is to continue protecting the low lying assets, which include properties, roads, agricultural land and coastal grazing marsh. However, in the medium and long term the plan is to realign the defences, to realise potential environmental, engineering and coastal process benefits. Under rising sea levels it is anticipated that it will become increasingly difficult to defend the shoreline and maintain a beach on this frontage, due to coastal squeeze and a general lack of natural sediment inputs. This would result in a need for very substantial hard defences, if the current alignment were to be held in the long-term. MR would avoid the need for such defences, possibly creating cost savings and environmental enhancement. No specific realignment position has been defined under the SMP; however it is intended that the villages of Allhallows and Grain, and the electricity / railway line would be protected.</p> <p>A policy of MR will allow some inundation and erosion (of the slopes at Grain) and a degree of natural coastal processes seawards of the realigned defence, together with the creation of important brackish and saline habitats. The loss of designated freshwater habitats would require mitigation measures to be implemented. In the long term, depending on the realignment extent, the shoreline has the potential to reach a position more in keeping with its natural form. As such, providing sediment supply is sufficient to keep pace with sea level rise, a fronting beach and in the vicinity of Yantlet Creek, mudflats and saltmarsh, could be maintained. MR would also result in new areas of intertidal habitat forming.</p> <p>The amount of realignment and subsequent flood (spatial) extent implemented along this frontage, has the potential to (slightly) increase tidal levels in the upstream sections of the Thames Estuary, but this is not anticipated to have any adverse effect on its hydromorphology or ecology.</p> <p>Therefore, these changes are related to a more naturally functioning Thames Lower transitional water body, and the overall effect will be a contribution to the achievement of Good Potential. Existing biological quality elements associated with beach habitat (primarily macro/benthic invertebrates, and fish) are likely to be sustainable, whilst an increase in the extent and variety of intertidal habitats will allow an overall improvement in all biological quality elements.</p>	n/a	✓	✓	n/a
4a02	Garrison Point to Minster	HTL	HTL	HTL	<p><b>Transitional – Medway</b></p> <p><b>Transitional – Thames Lower</b></p> <p>Garrison Point to Minster marks the western extremity of the Isle of Sheppey and the interface between the open coast and the Medway Estuary. This section of the coast comprises a dense urban area that extends to the shoreline and has regionally important strategic links. The long term plan is to continue protecting the developments including the residential, commercial, industrial and infrastructural assets. The HTL policy is matched by HTL for all three epochs in Policy Unit E4 29: Rushenden to Sheerness of the Medway Estuary and Swale SMP2.</p> <p>With rates of sediment feed and transportation along this frontage being low, very little change in coastal processes or impacts on evolution is likely to occur, although the somewhat limited inter-tidal area will continue to narrow. Considering also the short lengths of frontage in each water body (approximately 3¼ km in the Medway but less than ¾ km in the Thames Lower) it is unlikely that loss of habitat for macro / benthic invertebrates (and fish) associated with the already narrow foreshore will be significant to either water body. Thus it is considered that there will be no deterioration in ecological potential and no significant risk to any future Good Potential for either water body.</p>	n/a	✓	✓	n/a
4a03	Minster Town	HTL	HTL	HTL	<p><b>Transitional – Thames Lower</b></p> <p>Minster Town is an urban development located on clay cliffs and fronted by a popular tourist beach. The plan is to continue protecting the town and cliffs, which in turn will reduce landslide risk and the possible development of a flood corridor to the adjacent low-lying land at Sheerness. In the long term and under a scenario of sea level rise the beach will narrow. Subsequently significant amounts of beach nourishment will be required if an amenity beach is to be maintained.</p> <p>Although there are existing groynes along the frontage, rates of sediment feed and transportation along this frontage are low. Very little change in coastal processes or impacts on evolution are likely to occur in the short or medium term, whilst in the long term increased scour is anticipated resulting in the beach becoming denuded.</p> <p>Although the frontage is short (slightly over 2 km) the foreshore is quite wide (over ½ km) and the long term loss of this could be locally significant for macro / benthic invertebrates (and fish). Whilst unlikely to result in deterioration in water body ecological potential, there is a minor concern that this policy in the long term could contribute to a risk of failing to achieve Good Potential in the future.</p>	n/a	X Thames Lower	✓	n/a

Policy Unit		SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)			
		2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
4a04	Minster Slopes to Warden Bay	NAI	NAI	NAI	<p><b>Transitional – Thames Lower</b></p> <p>The eroding cliffs along the Minster Slopes to Warden Bay are of national conservation, geological and landscape importance. The long term recommendation is to allow continued erosion of the cliffs, which will maintain the geological exposures, environmental and landscape qualities of the frontage. Natural shoreline protection is provided by cliff fall debris and it is not necessary or visually desirable to defend this section of the coastline. With sea level rise and no defences protecting the toe it is anticipated that erosion rates will increase slightly. Material released from the cliffs will provide some degree of cover to the foreshore, albeit temporarily.</p> <p>The long-term consequence will be continued erosion of the cliffs and the shoreline. A naturally functioning coast will maintain the environmental interests, and will preserve the mix of sub-tidal, intertidal and seacliff habitats and associated biological quality elements. This will result in no deterioration of ecological potential of Thames Lower transitional water body; and will support the future achievement of Good Potential in the water body by allowing natural function of the shoreline.</p>	n/a	✓	✓	n/a
4a05	Warden Point to Leysdown-on-Sea	MR + HTL	MR + HTL	MR + HTL	<p><b>Coastal – Whitstable Bay</b></p> <p>This unit covers the cliffop village of Warden, a low-lying area known as 'The Bay' and the low-lying village of Leysdown-on-Sea. Management structures currently include a toe defence structure (which limits but does not prevent erosion) on the cliffed section at Warden, a concrete seawall at the low-lying section of Warden, a clay at the 'The Bay' and a concrete seawall and groynes at Leysdown-on-Sea.</p> <p>The short term plan is to upgrade and maintain the current defences at Warden, limiting the amount of cliff erosion and flood risk and continue to limit the flood risk at The Bay and Leysdown-on-Sea. In the medium and long term it is envisaged that the effectiveness of the toe defence will reduce in light of sea level rise and the gradual deterioration of the structure. This will result in gradually increasing erosion of the backing cliff, which will involve the loss of some cliffop properties. This policy does not adversely affect alongshore coastal processes. Any material eroded will contribute to the sediment budget.</p> <p>At The Bay, a change in the clay embankment alignment is proposed for the medium and long term. This approach will allow the shoreline to respond naturally, as such some inundation of the hinterland is anticipated, reduce the impact of coastal squeeze and prevent uncontrolled flooding. Some <i>freshwater interest will give way to saline habitats</i></p> <p>At Leysdown-on-Sea a continuation of current practises is recommended for the medium and long term to ensure protection of the residential area and infrastructure. In the long term and under a scenario of sea level rise the beach will narrow, and significant amounts of beach nourishment will be required if an amenity beach is to be maintained.</p> <p>Although some coastal defences will remain in place, the larger part of the frontage will be subject to MR. Since the amount of intertidal habitat created will be significantly larger than the amount lost to future coastal squeeze, and since alongshore processes will be largely unaffected, the overall result will be a net change to a more naturally functioning Whitstable Bay coastal water body. The consequences will, overall, be beneficial for biological quality elements through the increased area and variety of available intertidal habitats. Therefore, the overall effect will be a contribution to the achievement of Good Potential.</p>	n/a	✓	✓	n/a
4a06	Leysdown-on-Sea to Shell Ness	MR	MR	MR	<p><b>Coastal - Whitstable Bay</b></p> <p>The frontage comprises a managed beach, which is backed by low-lying coastal grazing marsh. Under rising sea levels it is anticipated that it will become increasingly difficult to maintain a beach along this frontage. If the current alignment were to be held in the long-term, coastal squeeze, together with a diminished supply of natural beach building sediment would lead to the need for substantial hard defences and / or significant beach</p>	n/a	✓	✓	n/a

Policy Unit		SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)			
		2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
					<p>management. MR is proposed, subject to further studies to investigate and define the best technical, environmental and economic option and any mitigation measures required for loss of designated freshwater habitat.</p> <p>Realignment will create a coast that will not require ever increasing maintenance intervention, will negate the effects of coastal squeeze and will create important brackish and saline habitats. Thus a more naturally-functioning coastline will result, which will support improvement in the ecological potential of the Whitstable Bay coastal water body.</p> <p>During the short term it is unlikely that there will be a significant change between the present day dynamics on the open coast and those within the Swale estuary. However, in the medium to long term:</p> <ul style="list-style-type: none"> <li>existing intertidal habitat will become increasingly inundated</li> <li>newly forming brackish and inter-tidal habitats will replace some of the freshwater interests</li> <li>the inter-dependency between the open coast and estuary will increase</li> <li>there is the potential that the durability of Shell Ness spit could reduce, due to a potential reduction in feed (from offshore) and the predicted rise in sea level, such that the northern shore of the Swale will realign landwards and the mouth will widen.</li> </ul> <p>All these changes are related to a more naturally functioning Whitstable Bay coastal water body and adjacent Swale transitional water body, with overall benefits for all associated biological quality elements. Therefore, the overall effect will be a contribution to the achievement of Good Potential in both these water bodies.</p>				
4a07A	Faversham Creek to the Sportsman Pub	HTL	MR	MR	<p><b>Transitional – Swale</b></p> <p>The frontage comprises extensive tidal mudflats to the west and a narrow beach extending to a small spit at Castle Coot in the east, A concrete seawall, extending along the majority of frontage, protects undeveloped low lying coastal grazing marsh. The intertidal habitats along the frontage and a small section of wetland (immediately west of the Sportsman Pub) have international nature conservation value. Under rising sea levels and a limited supply of contemporary beach building sediment, it is anticipated that the sparse section of beach will become increasingly difficult to maintain. If the current alignment were to be held in the long-term, coastal squeeze, together with a diminished supply of natural beach building sediment would lead to substantial hard defences and / or significant beach management. MR is proposed, subject to further studies to investigate and define the best technical, environmental and economic option and any mitigation measures required for loss of designated freshwater habitat.</p> <p>The proposed policy for this frontage is HTL (possibly with some localised MR) in the short term but then to implement MR of the entire frontage to create a coast that will not require ever increasing maintenance intervention, will negate the effects of coastal squeeze and will create important brackish and saline habitats. Thus a more naturally-functioning coastline will result, which will improve habitat conditions for biological quality elements and allow an improvement in the ecological potential of the Swale transitional water body.</p> <p>These changes are related to a more naturally functioning Swale transitional water body. Therefore, the overall effect will be a contribution to the achievement of Good Potential.</p>	n/a	✓	✓	n/a
4a07B	The Sportsman Pub to Seasalter	HTL	HTL	MR	<p><b>Transitional – Swale</b></p> <p>The frontage comprises a managed beach, which is backed by Faversham Road, a number of residential properties and partially developed low lying coastal grazing marsh, which is of international nature conservation value. A set back here would involve the loss of these assets. The short and medium term plan therefore, is to continue protecting the low-lying assets. In response to ongoing sea level rise and limited feed of beach</p>	n/a	✓	✓	n/a

Policy Unit	SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)				
	2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4	
				<p>building material, it is anticipated that the fronting beach will continue to narrow.</p> <p>Under long term rising sea levels and a limited supply of contemporary beach building sediment, it is anticipated that it will become increasingly difficult to maintain a beach along this frontage. Substantial hard defences and / or significant beach management would be required and would lead to coastal squeeze. Therefore, MR is proposed. No specific realignment 'line' has been defined but a maximum extent has been identified (i.e. no further than the railway line). Further studies will be required to investigate and define the best technical, environmental and economic option, including any mitigation measures required for loss of designated habitat.</p> <p>Although the short and medium term policy of HTL will allow coastal squeeze, this will be limited to a narrowing of the beach rather than loss of significant areas of intertidal habitat. The policy unit has a short frontage of c.2 km. Considering the longer term aspiration to implement MR and gain significant areas of intertidal habitat, and also considering the short term MR proposals along the adjacent and longer frontage of policy unit 4a07A, c.5 km, any effect on the Swale transitional water body's biological quality elements is considered to be insignificant and would not result in deterioration or in failure to achieve Good Potential in the future.</p> <p><b>River – White Drain</b></p> <p>White Drain (Graveney marshes) occupies the hinterland which, with a move towards MR, will partially develop as intertidal habitat. This more naturally functioning system will allow an improvement in the river water body's biological quality elements associated with more naturally functioning hydromorphological processes.</p>					
4a08	Seasalter to Whitstable Town (Golf Course)	HTL	HTL	HTL	<p><b>Transitional – Swale</b></p> <p><b>Coastal – Whitstable Bay</b></p> <p>This is an urban development fronted by an amenity beach. The plan is to continue protecting built assets and the seafront. Under a scenario of sea level rise it is anticipated that the fronting beach and lower foreshore will narrow, the wave cut rock platform will lower and defence scour will increase. Subsequently significant amounts of beach nourishment will be required if a beach is to be maintained.</p> <p>With rates of sediment feed and transportation along this frontage being low, little change in coastal processes is anticipated. Existing groynes along the frontage will continue to interrupt alongshore sediment transport.</p> <p>Thus the proposed policy will in time result in loss of intertidal foreshore habitats. The frontage is short (c.1 ½ km in the Swale water body and ½ km in the Whitstable Bay water body) and it is arguable that the policy will not result in any further deterioration in water body potential since the impacts on biological quality elements are likely to be restricted to macro / benthic invertebrates. However, the coastal squeeze coupled with long term interruption of alongshore sediment transport will contribute to a risk of failing to achieve Good Potential in the future.</p> <p>Alongshore movement is from east to west, i.e. away from Whitstable Bay, so the consequences will be insignificant for the Whitstable Bay water body.</p>	n/a	X Swale	✓	n/a
4a09	Whitstable Town (Golf Course) to Whitstable Harbour	HTL	HTL	HTL	<p><b>Coastal – Whitstable Bay</b></p> <p>Whitstable Town to Whitstable Harbour is a dense urban area that extends to the shoreline. The long term plan is to continue protecting the residential, commercial and industrial developments by maintaining the existing defences, i.e. the harbour arms, jetties, seawalls and the groyned beach. In the long term the defending sea wall is likely to need to be raised.</p> <p>Transportation rates along this frontage are high but sediment feed is low. As such, pressure on the coastal system will increase throughout the duration of the SMP2. The inter-tidal area will narrow, with little or no beach building material entering the system and few fines bypassing the defence structures. Thus, retaining a beach in front of substantial defence structures will become increasingly difficult, particularly on the downdrift side of the harbour.</p> <p>The frontage is short (little over 1 km) and the foreshore ranges in width from zero in the east to over ¾ km in the west. The loss of this intertidal area could be locally significant for intertidal macro / benthic invertebrates (and fish). Whilst unlikely to result in deterioration in water body ecological potential, there is a minor concern that this policy could contribute to a risk of failing to achieve Good Potential in the future.</p>	n/a	X Whitstable Bay	✓	n/a
4a10	Whitstable Harbour (east) to Swalecliffe	HTL	HTL	HTL	<p><b>Coastal – Whitstable Bay</b></p> <p>This is a densely populated urban frontage, with built assets extending to the edge of Tankerton Slopes and fronted by a popular tourist beach. The plan is to continue protecting the built assets and maintaining the amenity assets. In the long term however, this will inevitably result in a narrowing of the beach. Subsequently significant amounts of beach nourishment will be required if an amenity beach is to be maintained.</p>	n/a	X Whitstable Bay	✓	n/a

Policy Unit		SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)			
		2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
					<p>With rates of sediment feed and transportation along this frontage being low, very little change in coastal processes are likely to occur in the short term. In the long term this HTL policy and predicted sea level rise will probably induce increased scour, and beaches along this section of the coast are anticipated to denude.</p> <p>The frontage is a little over 3 km and the foreshore is generally approximately ¼ km in width. The loss of this intertidal area could be locally significant for intertidal macro / benthic invertebrates (and fish). Whilst unlikely to result in deterioration in water body ecological potential, there is a minor concern that this policy could contribute to a risk of failing to achieve Good Potential in the future.</p> <p><b>River - Gorrell Stream, Swalecliffe Brook</b></p> <p>The Gorrell Stream is culverted under Whitstable, before its flow is split to discharge partly through Whitstable Harbour (to flush out silt) and partly via an under-beach outfall. Any modification to the coastal defences (harbour or beach) would be insignificant for the river's biological quality elements in the absence of major "daylighting" of the culvert. Thus the proposed HTL is not considered to present a risk of deterioration in current ecological potential or failure to reach moderate potential in the future, since the culvert is considerably more significant for the river's biological quality elements.</p> <p>Swalecliffe Brook discharges over the shingle beach in the east of Whitstable. Under high tide conditions it can become tide locked, and hence the brook has a floodplain associated with a major meander behind the beach. Otherwise, there is effectively no saltwater-freshwater interface, and the HTL policy is considered to have no significant consequences for the brook's biological elements.</p>				
4a11	Swalecliffe to Herne Bay Breakwater	HTL	HTL	HTL	<p><b>Coastal – Thames Coastal South</b></p> <p><b>Coastal – Kent North</b></p> <p>This is a dense urban frontage, with assets extending to the shoreline fronted by a popular tourist beach, which is protected by the Neptune Arm breakwater. The plan is to continue protecting the frontage, which comprises the towns of Studd Hill and Herne Bay (west) and the amenity assets.</p> <p>In the long term and under a scenario of sea level rise the beach will narrow. Subsequently significant amounts of beach nourishment will be required if an amenity beach is to be maintained. Rates of sediment feed and transportation along this frontage are low, and very little change in coastal processes or impacts on evolution are likely to occur in the short or long term. HTL combined with predicted sea level rise will probably induce increased scour and beaches along this section of the coast are anticipated to denude in the long term.</p> <p>The frontage is over 4 km and the foreshore ranges between approximately ½ and ¾ km in width. Although short, the policy unit represents the entire costal length of the Thames Coastal South water body. The loss of this intertidal area would therefore represent loss of all the intertidal habitat for macro / benthic invertebrates (and fish) in Thames Coastal South water body, but would be only locally significant for biological quality elements in the Kent North. Whilst unlikely to result in deterioration in water body ecological potential, there is a minor concern that this policy could contribute to a risk of failing to achieve Good Potential in the future.</p> <p><b>Rivers – West Brook and Plenty Brook</b></p> <p>West Brook is canalised but has an open channel until culverted under the beach immediately west of Hampton Pier. HTL policy will not result in any deterioration in the brook's biological quality elements, but the artificial outfall could contribute to a risk of failing to achieve Good Potential in the future.</p> <p>Plenty Brook is culverted under Herne Bay before discharging via a piped culvert with a tidal flap. Any modification to the coastal defences (beach) would be insignificant for the brook's biological quality elements in the absence of major "daylighting" of the culvert. Thus the proposed HTL is not considered to present a risk of deterioration in current ecological potential or failure to reach moderate potential in the future, since the culverts are considerably more significant for the brook's biological quality elements.</p>	n/a	X Thames Coastal South & Kent North	✓	n/a
4a12	Herne Bay Breakwater to Bishopstone Manor	HTL	HTL	HTL	<p><b>Coastal – Kent North</b></p> <p>Urban development occupies a large proportion of this frontage and stretches to the seafront or the edge of the clay slopes. Protection of the property and infrastructure along this section of the coast and backing the clay slopes through HTL policy is critical.</p> <p>Rates of sediment feed and transportation along this frontage are low, and very little change in coastal processes or impacts on evolution is likely to occur. However, HTL will hold the shoreline seaward of its natural alignment and the coast will be prevented from functioning freely, and existing</p>	n/a	X Kent North	✓	n/a



Policy Unit	SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)				
	2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4	
				<p>groynes along this frontage interrupt alongshore sediment transport.</p> <p>In the long term, beach narrowing and an increase in sub-aerial cliff weathering is predicted. Subsequently significant amounts of beach nourishment will be required if an amenity beach is to be maintained and slope protection works will require additional maintenance. In the long term beaches along this section of the coast are anticipated to denude.</p> <p>The frontage is slightly over 3 km but the foreshore is relatively narrow, no more than ¼ km. The loss of this intertidal area would be only locally significant for macro / benthic invertebrates (and fish) in the Kent North water body. Whilst unlikely to result in deterioration in water body ecological potential, there is a minor concern that this policy could contribute to a risk of failing to achieve Good Potential in the future.</p>					
4a13	Reculver Country Park	NAI	NAI	NAI	<p><b>Coastal – Kent North</b></p> <p>The eroding cliffs at Reculver Country Park are of high conservation, landscape and recreational importance. The long term recommendation is to allow continued erosion of the cliffs, which will maintain the geological exposures and landscape quality of the frontage. Natural shoreline protection will be provided by cliff fall debris and it is not necessary or visually desirable to defend this section of the coastline. With sea level rise it is anticipated that erosion rates will increase. Material released from the cliffs will provide some predominantly fines to the foreshore and it is predicted that this will continue to contribute to the alongshore sediment budget.</p> <p>The long-term consequence will be continued erosion of the cliffs and the shoreline. A naturally functioning coast will maintain the environmental interests and continue to provide habitat suitable for the coastal biological quality elements in the Kent North water body. This will result in no deterioration of ecological potential of Kent North; rather it will support the future achievement of Good Potential in the water body by allowing natural functioning of the shoreline.</p>	n/a	✓	✓	n/a
4a14	Reculver Towers to Minnis Bay	HTL	HTL + MR	MR	<p><b>Coastal – Kent North</b></p> <p>The frontage comprises a managed beach, which is predominantly backed by sparsely developed low lying land, which has international nature conservation value. Under rising sea levels and a limited supply of contemporary beach building sediment, it is anticipated that it will become increasingly difficult to maintain a beach along this frontage.</p> <p>The short term plan is to continue protecting properties, local industries, footpaths, agricultural land and freshwater habitats. A more sustainable approach to the intensive beach maintenance at Coldharbour will need to be sought at the earliest opportunity. In response to ongoing sea level rise and limited feed of beach building material, it is anticipated that the fronting beach will continue to narrow.</p> <p>In the medium and long term the planned MR of the defences east of Reculver Towers will allow the shoreline to retreat in a controlled manner. (Reculver Towers and the small section of coast to the west would remain defended, due to the large scale flood risk and the international importance of the heritage assets.) This site has been identified as suitable for creating new saltwater habitats to offset losses elsewhere without impinging on existing designated freshwater habitats. No specific realignment 'line' has been defined but a maximum extent has been identified (the seaward side of the railway line). MR could involve the loss of a range of built and natural assets, including saline lagoons and freshwater habitats. Realignment would however, create a coast that will negate the effects of coastal squeeze and create important brackish and saline habitats.</p> <p>Although there may be short term effects on biological quality elements (most notably macro/benthic invertebrates and fish) associated with the narrowing of the beach, the medium and long term proposal of MR will help to establish a coast that will not require ever increasing maintenance intervention, negate the effects of coastal squeeze and create important brackish and saline habitats. Thus a more naturally-functioning coastline will result, which will support improvement in the overall biological quality elements of the Kent North water body. Therefore, the overall effect will be a contribution to the achievement of Good Potential.</p> <p><b>River – North Chislet Marsh</b></p> <p>North Chislet Marsh occupies the hinterland which, with a move towards a MR policy, will partially develop as intertidal habitat. This more naturally functioning system will allow an improvement in the river water body's biological quality elements associated with more naturally functioning hydromorphological processes.</p>	n/a	✓	✓	n/a
4a15	Minnis Bay to Westgate-on-Sea	HTL + NAI	HTL + NAI	HTL + NAI	<p><b>Coastal – Kent North</b></p> <p>Minnis Bay to Westgate-on-Sea is characterised by steep, chalk cliffs which are of international conservation and landscape importance. The towns of Birchington and Westgate are set back from the cliff top. The recommended policy is to continue maintaining defences where there is an economic justification, but where there currently are no defences in place, a continuation of this is recommended, which will allow natural processes</p>	n/a	✓	✓	n/a

Policy Unit	SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)				
	2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4	
				<p>to continue, including erosion of the rock platform and cliff toe.</p> <p>In the short term, HTL will involve maintaining / upgrading the existing defences at the toe of the cliff. However, if through detailed studies an opportunity for not maintaining defences is identified then a policy of NAI will be implemented. NAI is also proposed from the short term where there currently are no defences in place, which will allow erosion of the chalk cliffs and the fronting rock platform. These policies will continue in the medium and long term. Despite ongoing sea level rise, erosion and transportation rates, along this frontage, will remain low.</p> <p>Birchington occupies the larger part of the cliff top along this policy unit frontage of approximately 4½ km. The foreshore is typically about ¼ km wide, and is largely wave-cut platform. Implementing NAI where possible will allow some continuing supply of sediment through cliff toe erosion, whilst some cliff top erosion will continue along the entire frontage.</p> <p>The coastal squeeze effect that will result from rising sea levels, and that will result in future inundation of areas of the rocky foreshore, will be experienced naturally on NAI lengths of the frontage as well as on HTL lengths. Therefore the proposed policy is considered unlikely to result in deterioration in water body ecological potential, or to present a risk of failing to achieve Good Potential in the future.</p>					
4a16	Margate	HTL	HTL	HTL	<p><b>Coastal – Kent North</b></p> <p>This is a dense urban development fronted by a popular tourist beach that is also of international landscape and conservation importance. The plan is to continue protecting the frontage of this important town. Rates of sediment feed and transportation along this frontage are low, and very little change in coastal processes or impacts on evolution is likely to occur. In the medium to long term significant amounts of beach nourishment will be required if an amenity beach is to be maintained.</p> <p>Because sediment supply to this frontage is low, holding the shoreline seawards of its natural alignment through HTL is expected to result in narrowing of the beach and rocky inter-tidal area, with consequences for the biological quality elements associated with both habitat types.</p> <p>The frontage is more than 5 km and the foreshore ranges from approximately ¼ to more than ½ km. The loss of this intertidal area would be locally significant for macro / benthic invertebrates in the Kent North water body. However, were beach management to cease, it is likely the beach would narrow anyway due to limited material moving alongshore and offshore. Similarly, rising sea levels will naturally result in future inundation of areas of the rocky foreshore. Thus, the consequences of HTL policy for biological quality elements on either intertidal habitat type are unlikely to be significant.</p> <p>Therefore the proposed HTL policy is considered unlikely to result in deterioration in water body ecological potential or to present a risk of failing to achieve Good Potential in the future.</p>	n/a	✓	✓	n/a
4a17	Cliftonville (Fulsam Rock to White Ness)	HTL + NAI	HTL + NAI	HTL + NAI	<p><b>Coastal – Kent North</b></p> <p>The frontage of Cliftonville is characterised by steep, chalk cliffs which are of international conservation and landscape importance. The town of Cliftonville is set back from the cliff top. Therefore the recommended policy is to continue maintaining defences where there is an economic justification, but if detailed studies identify an opportunity for NAI then this will be implemented. Where there currently are no defences in place, a continuation of NAI will allow natural processes to take place, including erosion of the rock platform and cliff toe.</p> <p>These policies will continue in the medium and long term. Despite ongoing sea level rise, erosion and transportation rates, along this frontage, will remain low. Therefore the general character of this frontage will not alter significantly.</p> <p>NAI is proposed for approximately 1¼ km of frontage. Although the larger part (about 2½ km) of the cliff top is developed, occupied by Cliftonville and Kingsgate, this development is largely set back. Coupled with relatively low rates of erosion, this suggests a reasonably high opportunity for NAI to be preferred over HTL at additional locations. Implementing NAI where possible will allow some continuing supply of sediment through cliff toe erosion, whilst some cliff top erosion will continue along the entire frontage. The coastal squeeze effect that will result from rising sea levels, and that will result in future inundation of areas of the rocky foreshore, will be experienced naturally on NAI lengths of the frontage as well as on HTL lengths. Therefore the proposed policy is considered unlikely to result in deterioration in water body ecological potential, or to present a risk of failing to achieve Good Potential in the future.</p>	n/a	✓	✓	n/a
4b18	White Ness to Ramsgate	HTL + NAI	HTL + NAI	HTL + NAI	<p><b>Coastal – Kent North</b></p> <p>White Ness to Ramsgate is characterised by steep, chalk cliffs which are of international conservation and landscape importance. In some areas development is set back from the cliff top. Therefore the recommended policy is to continue maintaining defences where there is an economic justification, but if detailed studies identify an opportunity for NAI then this will be implemented. Where there currently are no defences in place, a</p>	n/a	✓	✓	n/a

Policy Unit		SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)			
		2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
					<p>continuation of NAI will allow natural processes to take place, including erosion of the rock platform and cliff toe.</p> <p>These policies will continue in the medium and long term. Despite ongoing sea level rise, erosion and transportation rates, along this frontage, will remain low. Therefore the general character of this frontage will not alter significantly.</p> <p>NAI is proposed for slightly over 2½ km of frontage. The larger part, slightly over 4½ km, of the frontage has cliff top development within Kingsgate and Ramsgate, and further opportunities for NAI to be preferred over HTL are likely to be limited. Implementing NAI where possible will allow some continuing supply of sediment through cliff toe erosion, whilst some cliff top erosion will continue along the entire frontage. The coastal squeeze effect that will result from rising sea levels, and that will result in future inundation of areas of the rocky foreshore, will be experienced naturally on NAI lengths of the frontage as well as on HTL lengths, with consequences for the associated biological quality elements.</p> <p>Therefore the proposed policy is considered unlikely to result in deterioration in water body potential, or to present a risk of failing to achieve Good Potential in the future.</p>				
4b19	Ramsgate Harbour	HTL	HTL	HTL	<p><b>Coastal – Kent North</b></p> <p>The Ramsgate Harbour frontage comprises a dense urban area that extends to the shoreline. HTL (maintaining the harbour arms, jetties, seawalls) is proposed to protect the key harbour / marina asset and the town.</p> <p>The frontage is only slightly over ½ km along the marina, with very little inter-tidal habitat, and that being artificial (associated with the deepened harbour). HTL policy is unlikely to result in any impact on biological quality elements here, either by way of deterioration or by preventing future achievement of Good Potential. Indeed, the retention of a harbour may provide benefits in terms of sustaining a potential fish spawning and nursery area on this frontage.</p>	n/a	✓	✓	n/a
4b20	Ramsgate Harbour (west) to north of the River Stour	HTL + NAI	HTL + NAI	HTL + NAI	<p><b>Coastal – Kent North</b></p> <p><b>Transitional – Stour (Kent)</b></p> <p>This section of the coast is characterised by steep chalk cliffs in the east (Kent South water body), of international conservation and landscape importance. Fronting the chalk cliffs is a sand beach of amenity value. In the west (Stour (Kent) water body) the chalk cliffs give way to a small section of geologically important sandstone cliffs, on top of which lies the village of Cliffs End and then to low-lying land, which is mostly undefended. Fronting the low-lying agricultural land are tidal flats, which extend north of the River Stour and are of international nature conservation value. This section abuts the Stour Catchment Flood Management Plan (CFMP) at the Stour Estuary mouth near Sandwich, and that CFMP has set policies related to fluvial flood risk management.</p> <p>The recommended policy is HTL where there is an economic justification. However, if through detailed studies an opportunity for NAI is identified then this will be implemented. Where there currently are no defences in place, a continuation of NAI will allow natural processes to continue.</p> <p>Despite ongoing sea level rise, erosion and transportation rates along this frontage will remain low throughout the short to long term. In the long term it is unknown whether the tidal flats of Pegwell Bay will continue to accrete due to the predicted rise in sea level and uncertainty of sediment supply. However there is potential for rates of cliff erosion (toe and top) to increase slightly during this epoch, due to the predicted rise in sea level and a potential increase in sub-aerial weathering.</p> <p>There is some potential for coastal squeeze of the soft intertidal habitats in Pegwell Bay as a result of HTL along part of the Stour (Kent) water body frontage. This will, however, be localised and is considered unlikely to result in deterioration in water body ecological potential. Since the larger part of the water body will be unmodified, and this is overall a sediment accreting water body, the consequences of limited HTL for associated angiosperms, benthic / macro invertebrates and fish is also considered unlikely to present a risk of failing to achieve Good Potential in the future. Any coastal squeeze of the foreshore along the cliff frontage in the Kent North water body would be experienced naturally anyway due to the slow rates of erosion, and the proposed policy is not expected to have any significant effect on ecological potential here.</p>	n/a	✓	✓	✓
4b21	South of the River Stour to Sandwich Bay Estate (north)	NAI	NAI	NAI	<p><b>Coastal – Kent North</b></p> <p><b>Transitional – Stour (Kent)</b></p> <p>A largely undeveloped frontage which is fronted by accreting sand dunes of international conservation importance. The long-term policy here is to protect the town of Sandwich and limit large scale flood inundation. Currently there are no formal shoreline defences in place, as the fronting sand</p>	n/a	✓	✓	n/a



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	2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4	
				<p>dunes are accreting naturally and provide the required standard of protection. As such, it is anticipated that the continued provision of flood defence will not require hard defence. Under this policy the nature conservation value will be maintained as the coastline functions naturally. This policy has no adverse environmental or coastal process affects, sustaining the SAC, SPA, Ramsar, SSSI and NNR designations.</p> <p>However, with sea level rise predicted to accelerate and uncertainty regarding sediment supply, the integrity of the dunes could come under threat in the long term. Should this be the case then active and preferably soft management of the dunes would be required to maintain the majority of the hinterland assets. This policy would still have no or limited adverse affects on the environment and coastal processes.</p> <p>The long-term consequence will be continued natural sand dune function. This will result in no deterioration of the associated biological quality elements of Kent North or Stour (Kent); rather it will contribute to the future achievement of Good Potential in these water bodies by allowing natural function of the shoreline and associated sand dune habitats.</p>					
4b22	Sandwich Bay Estate (north) to Sandown Castle (remains of)	HTL	HTL	HTL	<p><b>Coastal – Kent South</b></p> <p>Land here is very low and flood inundation could potentially affect an extensive area. There is a possibility that flooding could combine with frontages up and down drift and extend to the north Kent coast, along the Reculver to Minnis Bay frontage. The long term plan is therefore HTL, to minimise flood risk and protect the backing hinterland and its many associated assets, including environmental assets.</p> <p>A major effect of this policy will be the narrowing of the inter-tidal area. This will be highly susceptible to ‘squeeze’ under a scenario of sea level rise, thereby resulting in the possibility of little or no beach remaining in 100 years time. There is the potential that due to the predicted rise in sea level alternative engineering options will be required (i.e. hard defences) in the long term.</p> <p>Although the beach is narrow (less than 100m) the frontage is slightly over 3½ km, and combined also with similar loss of the beach in policy unit 4b23 there could be a notable loss of ecological elements (macroalgae, macro / benthic invertebrates and fish associated with the shingle and sand beach) and a risk of deterioration in ecological potential of the Kent South water body as well as a risk of failing to achieve Good Potential in the future.</p>	n/a	X Kent South	✓	n/a
4b23	Sandown Castle (remains of) to Oldstairs Bay	HTL	HTL	HTL	<p><b>Coastal – Kent South</b></p> <p>The towns of Deal, Walmer and Kingsdown dominate this section of the coast. As such the built assets extend to the shoreline, which in many places is fronted by popular tourist beaches and backed by low-lying land, although this does rise to the south, towards Kingsdown. The proposed HTL policy will continue protecting these towns and their associated seafronts.</p> <p>Under a scenario of sea level rise, a limited supply of contemporary sediment and the shoreline being held seawards of its natural alignment, a narrowing of the beach is predicted. In the medium to long term significant amounts of beach nourishment will be required if an amenity beach is to be maintained and existing defence structures will need to be upgraded if the built assets are to remain protected.</p> <p>Although the beach is narrow (generally less than 100m) the frontage is over 6 km, and combined also with similar loss of the beach in policy unit 4b22 there could be a notable loss of biological quality elements (macroalgae, macro / benthic invertebrates and fish associated with the shingle and sand beach) and a risk of deterioration in ecological potential of the Kent South water body as well as a risk of failing to achieve Good Potential in the future.</p>	n/a	X Kent South	✓	n/a
4b24	Oldstairs Bay to St Margaret’s Bay	NAI	NAI	NAI	<p><b>Coastal – Kent South</b></p> <p>The majority of this frontage is undeveloped, unprotected and eroding; as such the area is of high nature conservation and landscape value. However, there is a section in the north where a former Ministry of Defence Rifle Range lies at the base of the cliffs and is formed on a piece of land that is held forward of the cliff line by a substantial concrete seawall. This is now falling into a state of disrepair. The long term plan is to allow the cliffs to erode. This will improve and maintain the important geological, environmental and landscape qualities of this frontage. Natural erosion of the chalk cliffs, the rock platform and the cliff toe will provide debris from erosion which will provide some natural shoreline protection to the cliff toe. In response to sea level rise it is anticipated that cliff erosion may increase slightly during this period.</p> <p>The long-term consequence will be continued erosion of the chalk cliffs, the rock platform and the shoreline. A naturally functioning coast will maintain the environmental and geological interests. This will result in no deterioration in the intertidal or sub-tidal biological quality elements associated with the Kent South water body; rather it will contribute to the future achievement of Good Potential in the water body by allowing natural function of the shoreline. However, it should be noted that even without human intervention the rate of rising sea level in the future may result in the natural loss of intertidal habitats on the wave-cut chalk platform.</p>	n/a	✓	✓	n/a

Policy Unit		SMP Policy (see key)			Assessment of impact (including list of water bodies affected)	Environmental objectives met? (see Assessment Table 2)			
		2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
4b25	St Margaret's Bay	HTL	HTL	HTL	<p><b>Coastal – Kent South</b></p> <p>This unit covers the section of coast which contains the clifftop village of St Margaret's Bay as well as some development on the undercliff platform at the base of the cliffs. The long-term plan is HTL to continue to protect the assets. This is technically viable due to the low erosion rates of chalk cliffs, the limited amount of beach building material chalk cliffs provide, low sediment transportation rates along this frontage, the frontage being naturally sheltered and the limited impact on adjacent frontages.</p> <p>HTL will halt erosion at the toe of the cliff, although this is already (and naturally) low. Under a scenario of sea level rise and coastal squeeze, it will become increasingly difficult to maintain a beach along this section of the coast. Therefore, beach nourishment may be required in the medium to long term if an amenity beach is to be maintained.</p> <p>This policy unit has a frontage of approximately ½ km. The consequences of HTL for the Kent South water body are minor, due to the limited size of the frontage and the naturally low rate of cliff erosion (and provision of sediment to the water body). The future loss of the undercliff beach may have some local consequences for associated biological quality elements, but these would be sustained by beach nourishment. Thus, there is considered to be no risk of deterioration in the Kent South water body's ecological potential and no risk of the HTL policy causing failure to achieve Good Potential in the future.</p>	n/a	✓	✓	n/a
4b26	South Foreland	NAI	NAI	NAI	<p><b>Coastal – Kent South</b></p> <p>The steep chalk cliffs along this section of the coast are unprotected and eroding. This area is of high nature conservation and landscape value. The long term plan is to allow continued cliff erosion, which will maintain the important geological and environmental interests of the frontage and its landscape quality.</p> <p>The long-term consequence will be continued erosion of the chalk cliffs, the rock platform and the shoreline. A naturally functioning coast will maintain the environmental and geological interests. The policy will result in no deterioration of ecological potential of Kent South; rather it will contribute to the future achievement of Good Potential in the water body by allowing natural function of the shoreline. However, it should be noted that even without human intervention the rate of rising sea level in the future may result in the natural loss of intertidal habitats associated with the wave-cut chalk platform, which presents the main coastal habitat for biological quality elements in this policy unit frontage.</p>	n/a	✓	✓	n/a

**Key:** ATL - Advance The Line, HTL - Hold The Line, NAI – No Active Intervention, MR – Managed Realignment

Assessment Table 4 - Summary of Achievement (or Otherwise) of Environmental Objectives for Each Water Body in the SMP Area

Water Body (& related SMP policy units)	Environmental objectives met?				WFD Summary Statement required?
	WFD 1	WFD 2	WFD 3	WFD 4	
<b>Coastal Water Bodies</b>					
<b>Thames Coastal South</b> <b>GB640604640000</b> <b>(4a11)</b>	n/a	X	✓	n/a	<b>Yes</b> - Environmental Objective WFD2 may not be met by the SMP2 policy for 4a11
<b>Whitstable Bay</b> <b>GB640604290000</b> <b>(4a05, 4a06, 4a08, 4a09, 4a10)</b>	n/a	X	✓	n/a	<b>Yes</b> - Environmental Objective WFD2 may not be met by the SMP2 policy for 4a08, 4a09 and 4a10  (At the water body scale, both of the remaining policy units will contribute positively to the objective by promoting the development of intertidal habitat)
<b>Kent North</b> <b>GB65070451000</b> <b>(4a11, 4a12, 4a13, 4a14, 4a15, 4a16, 4a17, 4b18, 4b19, 4b20, 4b21, 4b22)</b>	n/a	X	✓	n/a	<b>Yes</b> - Environmental Objective WFD2 may not be met by the SMP2 policy for 4a11, 4a12 and 4b22  (At the water body scale, all the remaining policy units will have a neutral effect on WFD objective 2, except 4a14 which will contribute positively to the objective by promoting the development of intertidal habitat)
<b>Kent South</b> <b>GB640704540001</b> <b>(4b22, 4b23, 4b24, 4b25, 4b26)</b>	n/a	X	✓	n/a	<b>Yes</b> - Environmental Objective WFD2 may not be met by the SMP2 policy for 4b22 and 4b23  (At the water body scale, the remaining three policy units will have a neutral effect on WFD objective 2)
<b>Transitional Water Bodies</b>					
<b>Thames Lower</b> <b>GB530603911401</b> <b>(4a01, 4a02, 4a03, 4a04)</b>	n/a	X	✓	n/a	<b>Yes</b> - Environmental Objective WFD2 may not be met by the SMP2 policy for 4a03  (At the water body scale, two of the remaining policy units will have a neutral effect on WFD objective 2, and one will contribute positively to the objective by promoting the development of intertidal habitat)

Water Body (& related SMP policy units)	Environmental objectives met?				WFD Summary Statement required?
	WFD 1	WFD 2	WFD 3	WFD 4	
<b>Medway</b> <b>GB530604002300</b> <b>(4a02)</b>	n/a	✓	✓	n/a	<b>No</b>
<b>Swale</b> <b>GB530604011500</b> <b>(4a07A, 4a07B, 4a08)</b>	n/a	X	✓	n/a	<b>Yes</b> - Environmental Objective WFD2 may not be met by the SMP2 policy for 4a08  (At the water body scale, the remaining two policy units will contribute positively to the objective by promoting the development of intertidal habitat)
<b>Stour (Kent)</b> <b>GB520704004700</b> <b>(4b20, 4b21)</b>	n/a	✓	✓	n/a	<b>No</b>
<b>River Water Bodies</b>					
<b>White Drain</b> <b>GB106040018560</b> <b>(4a07B)</b>	n/a	✓	✓	n/a	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy
<b>Gorrell Stream</b> <b>GB107040019610</b> <b>(4a10)</b>	n/a	✓	✓	n/a	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy
<b>Swalecliffe Brook</b> <b>GB107040019630</b> <b>(4a10)</b>	n/a	✓	✓	n/a	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy
<b>West Brook</b> <b>GB107040019750</b> <b>(4a11)</b>	n/a	X	✓	n/a	<b>Yes</b> - Environmental Objective WFD2 may not be met by the SMP2 policy for 4a11
<b>Plenty Brook</b> <b>GB107040019760</b>	n/a	✓	✓	n/a	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy

Water Body (& related SMP policy units)	Environmental objectives met?				WFD Summary Statement required?
	WFD 1	WFD 2	WFD 3	WFD 4	
(4a11)					
North Chislet Marsh GB107040019770 (4a14)	n/a	✓	✓	n/a	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy
<b>Groundwater Bodies</b>					
North Kent Tertiaries GB40602G500200 (4a07A)	n/a	n/a	n/a	✓	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy
East Kent Tertiaries GB40702G501600 (4a13, 4a14, 4b20, 4b21)	n/a	n/a	n/a	✓	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy
Kent Isle of Thanet Chalk GB40701G500100 (4a14, 4a15, 4a16, 4a17, 4b18, 4b19, 4b20)	n/a	n/a	n/a	✓	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy
East Kent Chalk (Stour) GB40701G501500 (4b21, 4b22, 4b23, 4b24, 4b25, 4b26)	n/a	n/a	n/a	✓	<b>No</b> - not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy

## Assessment Table 5 - Water Framework Directive Summary Statement

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
<p><b>Thames Lower GB530603911401 4a03 (4a01, 4a02 and 4a04 are either neutral or contribute to WFD objectives</b></p>	<p><b>Mitigation measures:</b> have all practicable mitigation measures been incorporated into the preferred SMP policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.</p>	<p>The Thames Lower water body is considered to be Heavily Modified but as a result of navigation pressures, rather than coastal protection measures. The water body's Programme of Measures does not have any specific hydromorphological measures proposed in relation to coastal erosion / flood risk management.</p> <p>Since the SMP2 policy does not have any associated design proposals, no specific mitigation measures have yet been identified. It is suggested that the development of schemes associated with proposed HTL for 4a11 should take account of the hydromorphological mitigation measures identified for the adjacent Whitstable Bay water body, since these are quite comprehensive, i.e.:</p> <ul style="list-style-type: none"> <li>• Indirect / offsite mitigation (offsetting measures)</li> <li>• Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>• Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>• Managed realignment of flood defence – but see comments made overleaf under “Better environmental options”</li> <li>• Bank rehabilitation / reprofiling</li> <li>• Preserve and, where possible, restore historic aquatic habitats</li> <li>• Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> <li>• Remove obsolete structure</li> </ul> <p>Mitigation should also consider the overlap of 4a03 with the “Sheppey” shellfish water.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Overriding public interest:</b> can it be shown that the reasons for selecting the preferred SMP policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP policies to human health, to the maintenance of health and safety or to sustainable development?</p>	<p>The SMP2's Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policy for unit 4a03. Comparison was made of potential policies HTL, MR and NAI. Appendix H sets out the economic damages associated in particular with NAI.</p> <p>In policy unit 4a03 there is an overriding interest in defending cliff top residential properties at Minster and the eastern extent of East End, cliff top commercial properties – including local businesses and caravan and camping sites, community facilities at Minster and the eastern extent of East End (such as churches, pubs, shops, schools, village halls)) and infrastructure including local roads, bridges and tracks, services and communications. Properties in the future NAI coastal floodplain have an estimated future (2105) capital value of c.£24m. However, unconstrained erosion associated with any NAI policy in this location would include land-sliding, which could initiate the development of a flood corridor to the adjacent flood risk area of Sheerness. No associated economic damages have been estimated.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Better environmental options:</b> have other significantly better options for the SMP policies been considered? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly?</p>	<p>SMP2 Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policy for unit 4a03. Section G2 of the Appendix summarises the appraisal of all conceptual policies - HTL, MR and NAI – in terms of the consequent shoreline response, and thus determine options which might be considered further in the context of achieving the SMP2’s objectives.</p> <p>Section G3 of the Appendix then assesses each plausible policy in each epoch against each objective. For policy unit 4a03 there are no objectives specific to the preservation of sub-tidal or inter-tidal habitats and associated conditions for biological quality elements. However, there is a policy to promote biodiversity opportunities and prevent loss/ damage to designated sites on Sheppey Cliffs. This would be supported by NAI, partially supported by MR but not supported by HTL.</p> <p>Comparing HTL (<u>proposed</u>) with NAI and MR options:</p> <ul style="list-style-type: none"> <li>• MR would result, in the long term, in landscape degradation and loss of cultural heritage sites, facilities for recreation on the foreshore and coastline, and public footpaths</li> <li>• MR would similarly allow loss of some of these environmental assets, although less extensively than under NAI</li> <li>• HTL would allow all these assets to be maintained</li> </ul> <p>As indicated above, NAI is not a viable option due to the associated risk of major flooding of Sheerness. Since policy unit 4a03 is associated with a dense urban area, developed to the edge of the low coastal slope and fronted by a shingle beach, the opportunities for migrating the shoreline are severely constrained and could present significant risk to the water body if flooded (e.g. through water contamination). The SMP2 identified that there are localised opportunities to the east of 4a03 to incorporate MR and the policy unit boundary with 4a04 (which has NAI proposed) was drawn to reflect this. Thus, whilst there is no better environmental option that would meet the overriding public interest objectives associated with continuing to defend key assets (summarised above).</p>



Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Affect on other water bodies:</b> can it be demonstrated that the preferred SMP policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?</p> <p><b>Other issues:</b> can it be shown that there are no other over-riding issues that should be considered (such as designated sites, recommendations of the Appropriate Assessment)?</p>	<p>Policy unit 4a03 is not associated with any other water bodies and the proposed policy will not have effects that are likely to extend into the adjacent coastal water body.</p> <p>SMP2 Appendix J sets out the conclusions of an Appropriate Assessment of the potential for the SMP2 policies to have significant effects on any European designated nature conservation site within the SMP2 study area, carried out by the Natural England and Canterbury City Council.</p> <p>Policy unit 4a03 is not associated with any such site and presents no risk of significant effect on any SPA, SAC or Ramsar sites in the SMP2 study area.</p>
<p><b>Thames Coastal South</b> <b>GB640604640000</b> <b>4a11</b> <b>(the only policy unit)</b></p>	<p><b>Mitigation measures:</b> have all practicable mitigation measures been incorporated into the preferred SMP policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.</p>	<p>Policy unit 4a11 is the only unit within Thames Coastal South. The policy unit also overlaps Kent North.</p> <p>Overall, the Thames Coastal South water body is considered to be Heavily Modified, as a result of coastal protection measures. Since the SMP2 policy does not have any associated design proposals, no specific mitigation measures have yet been identified. The development of schemes associated with proposed HTL for 4a11 should take account of the hydromorphological mitigation measures identified in the RBMP, i.e.:</p> <ul style="list-style-type: none"> <li>• Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>• Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>• Preserve and, where possible, restore historic aquatic habitats</li> </ul> <p>Mitigation should also consider the overlap of 4a11 with the “Whitstable” shellfish water.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Overriding public interest:</b> can it be shown that the reasons for selecting the preferred SMP policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP policies to human health, to the maintenance of health and safety or to sustainable development?</p>	<p>The SMP2's Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policy for unit 4a11. Comparison was made of potential policies ATL, HTL, MR and NAI. Appendix H sets out the economic damages associated in particular with NAI.</p> <p>In policy unit 4a11 there is an overriding interest in defending residential properties at Swalecliffe, Studd Hill and Herne Bay, cliff top residential properties at Studd Hill and Herne Bay, commercial properties at Swalecliffe, Studd Hill and Herne Bay, community facilities at Swalecliffe, Studd Hill and Herne Bay (such as churches, pubs, shops, schools, village halls) and major infrastructure including local roads, main railway line, Swalecliffe Sewage Treatment works, services and communications. Properties in the future NAI coastal floodplain have an estimated future (2105) capital value of c.£236m.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Better environmental options:</b> have other significantly better options for the SMP policies been considered? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly?</p>	<p>SMP2 Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policy for unit 4a11. Section G2 of the Appendix summarises the appraisal of all conceptual policies - ATL, HTL, MR and NAI – in terms of the consequent shoreline response, and thus determine options which might be considered further in the context of achieving the SMP2's objectives.</p> <p>Section G3 of the Appendix then assesses each plausible policy in each epoch against each objective. Critically to this WFD assessment, those objectives included:</p> <ol style="list-style-type: none"> <li>1. Coastal habitat at Swalecliffe - promote biodiversity opportunities and prevent loss/ damage to designated site from flooding/ risk management works</li> <li>2. Intertidal habitat along the frontage - promote biodiversity opportunities and avoid net loss of intertidal habitat and associated species from coastal squeeze and erosion / flood risk management works</li> </ol> <p>Comparing the SMP2 policy options:</p> <ul style="list-style-type: none"> <li>• HTL (<u>proposed</u>) – partially supports 1 (freshwater habitat maintained) but not 2 (inter-tidal habitats adversely affected)</li> <li>• MR – supports 1 (bio-diversity opportunity for fresh and inter-tidal habitats) and partially supports 2 (impact will depend on the line and the defences chosen)</li> <li>• NAI – partially supports 1 (freshwater habitat lost, inter-tidal habitat extends) and supports 2 (inter-tidal habitat maintained)</li> <li>• ATL – has no advantages over proposed HTL</li> </ul> <p>Thus, conceptually, MR or NAI might present better environmental options for the water body than HTL. However:</p> <ul style="list-style-type: none"> <li>• NAI would result, in the long term, in loss of Herne Bay Conservation Area, known cultural heritage sites, facilities for recreation including moorings, parking, public open spaces, access to the beach and foreshore, and public footpaths, including the Saxon Shore Way</li> <li>• MR would similarly allow loss of some of these environmental assets, although less extensively than under NAI</li> <li>• HTL would allow all these assets to be maintained</li> </ul> <p>Since policy unit 4a11 is associated with a dense urban area developed to the water's edge and fronted only by a shingle beach, the opportunities for migrating the shoreline are severely constrained and could present significant risk to the water body if flooded (e.g. through water contamination). Thus, neither NAI nor MR present an environmentally better option that could also meet the overriding public interest objectives associated with continuing to defend key assets (summarised above).</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Affect on other water bodies:</b> can it be demonstrated that the preferred SMP policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?</p>	<p>The proposed policy for unit 4a11 will not have effects that are likely to extend into the adjacent coastal water body.</p>
	<p><b>Other issues:</b> can it be shown that there are no other over-riding issues that should be considered (such as designated sites, recommendations of the Appropriate Assessment)?</p>	<p>See discussion of 4a11 under Kent North</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
<p><b>Whitstable Bay</b>  <b>GB640604290000</b>  <b>(Coastal)</b>  <b>4a08, 4a09, 4a10</b>  <b>(4a05 and 4a06 both contribute to WFD objectives)</b></p>	<p><b>Mitigation measures:</b> have all practicable mitigation measures been incorporated into the preferred SMP policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.</p>	<p>Overall, the Whitstable Bay water body is considered to be Heavily Modified, as a result of coastal protection measures. Since the SMP2 policies do not have any associated design proposals, no specific mitigation measures have yet been identified. The development of schemes associated with proposed HTL policies should take account of the hydromorphological mitigation measures identified in the RBMP, i.e.:</p> <ul style="list-style-type: none"> <li>• Indirect / offsite mitigation (offsetting measures)</li> <li>• Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>• Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>• Managed realignment of flood defence</li> <li>• Bank rehabilitation / reprofiling</li> <li>• Preserve and, where possible, restore historic aquatic habitats</li> <li>• Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> <li>• Remove obsolete structure</li> </ul> <p>Mitigation should also consider the overlap of 4a08, 4a09 and 4a10 with the “Swale East” shellfish water.</p> <p>Additionally, consideration is needed of policy units 4a05 and 4a06 for which the proposed policies are MR (with HTL where required), providing opportunities for the water body to return to a more natural state, improving habitats and conditions for biological quality elements.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Overriding public interest:</b> can it be shown that the reasons for selecting the preferred SMP policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP policies to human health, to the maintenance of health and safety or to sustainable development?</p>	<p>The SMP2's Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policies for these policy units. Comparison was made of potential policies ATL, HTL, MR and NAI. Appendix H sets out the economic damages associated in particular with NAI.</p> <p>In policy unit 4a08 there is an overriding interest in defending residential properties at Seasalter and Whitstable, commercial properties at Seasalter and Whitstable, community facilities at Seasalter and Whitstable (such as churches, pubs, shops, schools, village halls) and major infrastructure including local roads, the Faversham-Margate railway line, services and communications. Properties in the future NAI coastal floodplain have an estimated future (2105) capital value of c.£24m.</p> <p>In policy units 4a09 and 4a10 there is an overriding interest in defending residential properties at Whitstable, commercial properties at Whitstable, community facilities at Whitstable and Tankerton (such as churches, pubs, shops, schools, village halls) Whitstable Harbour and its associated facilities and businesses and other major infrastructure including local roads, the Faversham-Margate railway line, services and communications. Properties in the future NAI coastal floodplain have an estimated future (2105) capital value of c.£636m in policy unit 4a09 and c.£35m in 4a10.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Better environmental options:</b> have other significantly better options for the SMP policies been considered? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly?</p>	<p>SMP2 Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policies for each of these policy units. Section G2 of the Appendix summarises the appraisal of all conceptual policies - ATL, HTL, MR and NAI – in terms of the consequent shoreline response, and thus determines options which might be considered further in the context of achieving the SMP2’s objectives.</p> <p>Section G3 of the Appendix then assesses each plausible policy in each epoch against each objective. Critically to this WFD assessment, those objectives included:</p> <ol style="list-style-type: none"> <li>1. Intertidal habitat along the frontage - promote biodiversity opportunities and avoid net loss of intertidal habitat and associated species from coastal squeeze and erosion / flood risk management works</li> </ol> <p>HTL (<u>proposed</u>) will have adverse effects on intertidal habitats, whilst NAI would maintain it and MR would partially maintain it (depending on the new defence alignment). ATL has no advantages over proposed HTL. However:</p> <ul style="list-style-type: none"> <li>• NAI would result, in the long term, in loss of shellfish beds on the foreshore, Tankerton Slopes SSSI (terrestrial), Whitstable Town Conservation Area, facilities for recreation including moorings, yacht club, golf course, parking, public open spaces, access to the beach and foreshore, and public footpaths, including the Saxon Shore Way</li> <li>• MR would similarly allow loss of some of these environmental assets, although less extensively than under NAI</li> <li>• HTL would allow all these assets to be maintained</li> </ul> <p>Since all three policy units are associated with a dense urban area developed to the water’s edge and fronted by the harbour or shingle beach, opportunities for migrating the shoreline are constrained and could present significant risk to the water body if flooded (e.g. through water contamination). Thus, neither NAI nor MR present an environmentally better option that could also meet the overriding public interest objectives associated with continuing to defend key assets (summarised above).</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Affect on other water bodies:</b> can it be demonstrated that the preferred SMP policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?</p>	<p>The proposed policies for policy units 4a08, 4a09 and 4a10 are not likely to extend into the adjacent coastal water body.</p> <p>As indicated in Table 3, 4a10 is associated with two river water bodies (Gorrell Stream and Swalecliffe Brook), but the proposed HTL SMP2 policy is considered to have no significant consequences for the WFD objectives for either.</p>
	<p><b>Other issues:</b> Can it be shown that there are no other over-riding issues that should be considered (such as designated sites, recommendations of the Appropriate Assessment)?</p>	<p>SMP2 Appendix J sets out the conclusions of an Appropriate Assessment (AA) of the potential for the SMP2 policies to have significant effects on any European designated nature conservation site within the SMP2 study area, carried out by the Natural England and Canterbury City Council.</p> <p>Policy unit 4a10 is located partially within the Thanet Coast and Sandwich Bay SPA and Ramsar site and the AA initially concluded that HTL policy in a number of policy units within this designated site would be likely to have a direct significant negative impact on intertidal reef habitats, since reduced chalk cliff erosion would reduce the supply of material to maintain the reef level against rising sea levels. However, since the frontage in 4a10 has minimal chalk sediment supply associated with it, any effects from this policy unit will be minor. Additionally Natural England concluded that in total 200ha of inter-tidal reef will change to sub-tidal over the 100 year period covered by the SMP2, but as this is not the result of SMP2 policies, it is classified as natural change.</p> <p>Policy units 4a08 and 4a09 are located in The Swale SPA and Ramsar site. The AA concluded that available studies show the estuary is not suffering coastal squeeze from HTL policies.</p>
<p><b>Swale GB530604011500 4a08 (4a07A and 4a07B both contribute to WFD objectives)</b></p>	<p><b>Mitigation measures:</b></p> <p><b>Overriding public interest:</b></p> <p><b>Better environmental options:</b></p> <p><b>Affect on other water bodies:</b></p> <p><b>Other issues:</b></p>	<p>See discussion of 4a08 under Whitstable Bay</p>



Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
<p><b>Kent North</b>  <b>GB65070451000</b>  <b>4a11, 4a12, 4b22</b>  <b>(4a13, 4a14, 4a15, 4a16, 4a17, 4b18, 4b19, 4b20 and 4b21 are either neutral or contribute to WFD objectives)</b></p>	<p><b>Mitigation measures:</b> have all practicable mitigation measures been incorporated into the preferred SMP policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.</p>	<p>Overall, the Kent North water body is considered to be Heavily Modified, as a result of coastal protection measures. Since the SMP2 policy does not have any associated design proposals, no specific mitigation measures have yet been identified. The development of schemes associated with proposed HTL policies should take account of the hydromorphological mitigation measures identified in the RBMP, i.e.:</p> <ul style="list-style-type: none"> <li>• Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>• Managed realignment of flood defence</li> <li>• Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution</li> </ul> <p>Mitigation should also consider the overlap of 4a11 and 4a12 with the "Whitstable" shellfish water</p>
	<p><b>Overriding public interest:</b> can it be shown that the reasons for selecting the preferred SMP policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP policies to human health, to the maintenance of health and safety or to sustainable development?</p>	<p>The SMP2's Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policy for each policy unit. Comparison was made of potential policies ATL, HTL, MR and NAI. Appendix H sets out the economic damages associated in particular with NAI.</p> <p>In policy units 4a11 and 4a12 there is an overriding interest in defending residential properties at Swalecliffe, Studd Hill and Herne Bay, cliff top residential properties at Studd Hill and Herne Bay, commercial properties at Swalecliffe, Studd Hill and Herne Bay, community facilities at Swalecliffe, Studd Hill and Herne Bay (such as churches, pubs, shops, schools, village halls) and major infrastructure including the A299, local roads, main railway line, Swalecliffe Sewage Treatment works, services and communications. Properties in the future NAI coastal floodplain have an estimated future (2105) capital value of c.£236m for 4a11 and £96m for 4a12.</p> <p>In policy unit 4b22 there is an overriding interest in defending residential properties, commercial properties and community facilities (such as churches, pubs, shops, schools, village halls) at Deal and North Deal, and golf courses and major infrastructure including railway line, local roads, sewage treatment works, electricity pylons, services and communications. Properties in the future NAI coastal floodplain have an estimated future (2105) capital value of c.£385m, with an additional £4.5m of agricultural land.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Better environmental options:</b> have other significantly better options for the SMP policies been considered? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly?</p>	<p>SMP2 Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policy for all units. Section G2 of the Appendix summarises the appraisal of all conceptual policies - ATL, HTL, MR and NAI – in terms of the consequent shoreline response, and thus determine options which might be considered further in the context of achieving the SMP2’s objectives.</p> <p>Section G3 of the Appendix then assesses each plausible policy in each epoch against each objective. Critically to this WFD assessment, those objectives included:</p> <ol style="list-style-type: none"> <li>1. Intertidal habitat along the frontage - promote biodiversity opportunities and avoid net loss of intertidal habitat and associated species from coastal squeeze and erosion / flood risk management works</li> </ol> <p>HTL (<u>proposed</u>) will have adverse effects on intertidal habitats, whilst NAI would maintain it and MR would partially maintain it (depending on the new defence alignment). ATL has no advantages over proposed HTL. However:</p> <p>Thus, conceptually, MR or NAI might present better environmental options for the water body than HTL. However:</p> <ol style="list-style-type: none"> <li>1. NAI would result, in the long term, in loss of coastal grazing marsh (UK priority) habitat, Hackling Marsh SSSI, Reculver SAM, Herne Bay Conservation Area, known cultural heritage sites, facilities for recreation including Reculver Country Park, moorings, parking, public open spaces, access to the beach and foreshore, and public footpaths, including the Saxon Shore Way and Wantsum Walk</li> <li>2. MR would similarly allow loss of some of these environmental assets, although less extensively than under NAI</li> <li>3. HTL would allow all these assets to be maintained</li> </ol> <p>Since policy units 4a11 and 4a12 are associated with a dense urban area, developed to the water’s edge (4a11) or to an internationally conservation designated coastal slope (4a12), the opportunities for migrating the shoreline here are severely constrained and could present significant risk to the water body if flooded (e.g. through water contamination). The coast in policy unit 4b22 is largely undeveloped but is backed by low-lying land. MR here presents significant risks, since flood inundation at this location has the potential to affect an extensive area by connecting the east Kent coast with the north Kent coast. Thus, neither NAI nor MR present an environmentally better option that could also meet the overriding public interest objectives associated with continuing to defend key assets (summarised above).</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Affect on other water bodies:</b> can it be demonstrated that the preferred SMP policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?</p>	<p>The proposed policies for policy units 4a11, 4a12 and 4b22 are not likely to extend into the adjacent coastal water body.</p> <p>As indicated in Table 3, 4a11 is associated with 2 river water bodies, one of which (West Brook GB107040019750) could potentially fail its WFD objectives as a result of the proposed HTL. West Brook is Heavily Modified, as a result of flood protection. Measures from the RBMP that are most relevant to SMP2 scheme implementation are:</p> <ul style="list-style-type: none"> <li>• Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>• Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works</li> </ul> <p>Further “riparian” mitigation measures should also be considered as appropriate to offset the beach culvert and tidal flap pressure, i.e.:</p> <ul style="list-style-type: none"> <li>• Retain marginal aquatic and riparian habitats (channel alteration)</li> <li>• Increase in-channel morphological diversity</li> </ul> <p>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</p>
	<p><b>Other issues:</b> can it be shown that there are no other over-riding issues that should be considered (such as designated sites, recommendations of the Appropriate Assessment)?</p>	<p>SMP2 Appendix J sets out the conclusions of an Appropriate Assessment (AA) of the potential for the SMP2 policies to have significant effects on any European designated nature conservation site within the SMP2 study area, carried out by the Natural England and Canterbury City Council.</p> <p>Policy units 4a11, 4a12 and 4b22 are located within the Thanet Coast and Sandwich Bay SPA and Ramsar site and the AA initially concluded that HTL policy in a number of policy units within this designated site would be likely to have a direct significant negative impact on intertidal reef habitats, since reduced chalk cliff erosion would reduce the supply of material to maintain the reef level against rising sea levels. However, Natural England concluded that in total 200ha of inter-tidal reef will change to sub-tidal over the 100 year period covered by the SMP2, but as this is not the result of SMP2 policies, it is classified as natural change.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
<b>Kent South GB640704540001</b> <b>4b22, 4b23</b> <b>(4b24, 4b25 and 4b26 are either neutral or contribute to WFD objectives)</b>	<b>Mitigation measures:</b> have all practicable mitigation measures been incorporated into the preferred SMP policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	<p>Overall, the Kent South water body is considered to be Heavily Modified, as a result of coastal protection measures. Since the SMP2 policy does not have any associated design proposals, no specific mitigation measures have yet been identified. The development of schemes associated with proposed HTL policies should take account of the hydromorphological mitigation measures identified in the RBMP, i.e.:</p> <ul style="list-style-type: none"> <li>• Operational and structural changes to locks, sluices, weirs, beach control, etc</li> <li>• Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</li> <li>• Preserve and, where possible, restore historic aquatic habitats</li> </ul>
	<b>Overriding public interest:</b> can it be shown that the reasons for selecting the preferred SMP policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP policies to human health, to the maintenance of health and safety or to sustainable development?	<p>The SMP2's Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policy for each policy unit. Comparison was made of potential policies ATL, HTL, MR and NAI. Appendix H sets out the economic damages associated in particular with NAI.</p> <p>In policy unit 4b22 there is an overriding interest in defending residential properties, commercial properties and community facilities (such as churches, pubs, shops, schools, village halls) at Deal, Walmer and Kingsdown, golf courses and major infrastructure including the railway line and station, local roads, sewage treatment works, electricity pylons, services and communications. Properties in the future NAI coastal floodplain have an estimated future (2105) capital value of c.£385m, with an additional £4.5m of agricultural land for policy unit 4b22. Unit 4b23 potentially risks these same assets plus a further c.£34m of property.</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Better environmental options:</b> have other significantly better options for the SMP policies been considered? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly?</p>	<p>SMP2 Appendix G sets out the conclusions of scenario testing which was used to develop the proposed policy for all units. Section G2 of the Appendix summarises the appraisal of all conceptual policies - HTL, MR and NAI – in terms of the consequent shoreline response, and thus determine options which might be considered further in the context of achieving the SMP2's objectives.</p> <p>Section G3 of the Appendix then assesses each plausible policy in each epoch against each objective. Critically to this WFD assessment, those objectives included:</p> <ol style="list-style-type: none"> <li>1. Intertidal habitat and subtidal habitats - promote biodiversity opportunities and prevent loss/damage to habitats from coastal squeeze and risk management works</li> <li>2. Deal, Kingdown and Walmer Beaches - promote biodiversity opportunities and prevent loss/damage to habitat from coastal squeeze and risk management works</li> </ol> <p>HTL (<u>proposed</u>) will have adverse effects on intertidal habitats, and will disturb some beaches in the short to medium term and lead to coastal squeeze in the long term. NAI would largely maintain both habitat types and MR would be intermediate.</p> <p>Thus, conceptually, MR or NAI might present better environmental options for the water body than HTL. However:</p> <ol style="list-style-type: none"> <li>1. NAI would result, in the long term, in loss of coastal grazing marsh (UK priority) habitat, Hackling Marsh SSSI, three SAMs (Sandown, Deal and Walmer Castles), three Conservation Areas (Deal Town, Walmer and seafront, Kingsdown), known cultural heritage sites, facilities for recreation including marinas and watersports clubs, Deal Pier and promenade Reculver Country Park, public open spaces, access to the beach and foreshore, and public footpaths, including the Saxon Shore Way</li> <li>2. MR would similarly allow loss of some of these environmental assets, although less extensively than under NAI</li> <li>3. HTL would allow all these assets to be maintained</li> </ol> <p>The coast in policy unit 4b22 is largely undeveloped but is backed by low-lying land. MR here presents significant risks, since flood inundation at this location has the potential to affect an extensive area by connecting the east Kent coast with the north Kent coast. Policy unit 4b23 is along a largely low-lying frontage with extensive residential and commercial developments, together with important road and rail links. The frontage is backed by the Lydden Valley, which is of environmental importance. Thus, neither NAI nor MR present an environmentally better option that could also meet the overriding public interest objectives associated with continuing to defend key assets (summarised previously under "Overriding public interest").</p>

Water body (including policy units that affect it)	Water Framework Directive Summary Statement checklist	Brief description of decision making and reference to further documentation within the SMP
	<p><b>Affect on other water bodies:</b> can it be demonstrated that the preferred SMP policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?</p>	<p>Policy units 4b22 and 4b23 are not associated with any other water bodies and the proposed policies will not have effects that are likely to extend into the adjacent coastal water body.</p>
	<p><b>Other issues:</b> can it be shown that there are no other over-riding issues that should be considered (such as designated sites, recommendations of the Appropriate Assessment)?</p>	<p>Policy unit 4b23 is not associated with any other water bodies and the proposed policy will not have effects that are likely to extend into the adjacent coastal water body.</p> <p>See discussion of 4b22 under Kent North</p>