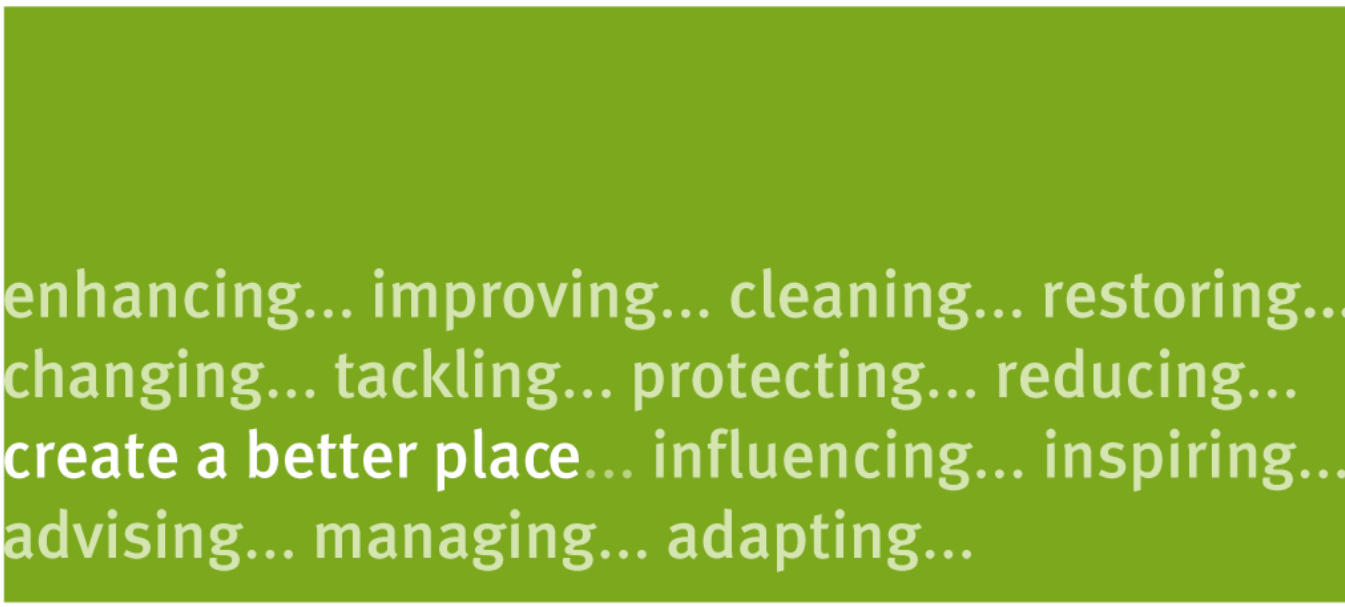

Annex L1

Medway and Swale Estuary SMP compliance with the Water Framework Directive

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1 Introduction and Background

The purpose of this appendix is to demonstrate that the Medway and Swale Estuary Shoreline Management Plan (SMP) complies with the requirements of the Water Framework Directive.

The EU Water Framework Directive was transposed into law in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. The Directive is designed to protect and improve the environmental condition of all waters, including rivers, lakes, groundwater, estuaries and coastal waters. It is implemented through river basin planning, which introduces a six-yearly cycle of planning, action and review. Every six years a River Basin Management Plan (RBMP) will be produced for each river basin district.

The Directive establishes a framework requiring Member States to:

- prevent deterioration of aquatic ecosystems, protect them and improve the ecological health of waters.
- aim to achieve at least good status for all waters;
- promote sustainable use of water as a natural resource;
- conserve habitats and species directly depending on water;
- progressively reduce or phase out individual pollutants or groups of pollutants that present a significant risk to the aquatic environment;
- progressively reduce the pollution of groundwater;
- contribute to mitigating the effects of floods and droughts.

The RBMPs will summarise the actions or measures within the waterbodies that are required to enable these objectives to be met. The Medway and Swale Estuary SMP falls within the Thames River Basin District and adjoins the South East River Basin District (Figure 1.1). The first draft of the RBMPs will be published in December 2008. The boundary of the SMP is shown on Figure 1.2.

Figure 1.1 Thames River Basin District

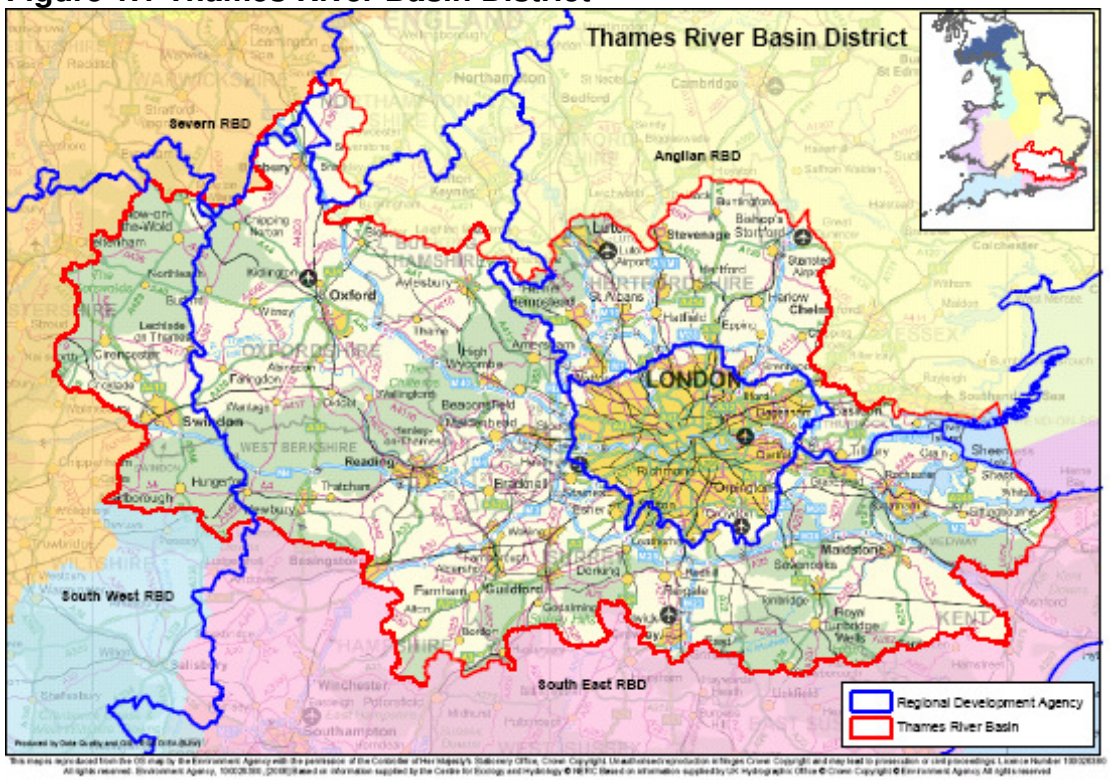
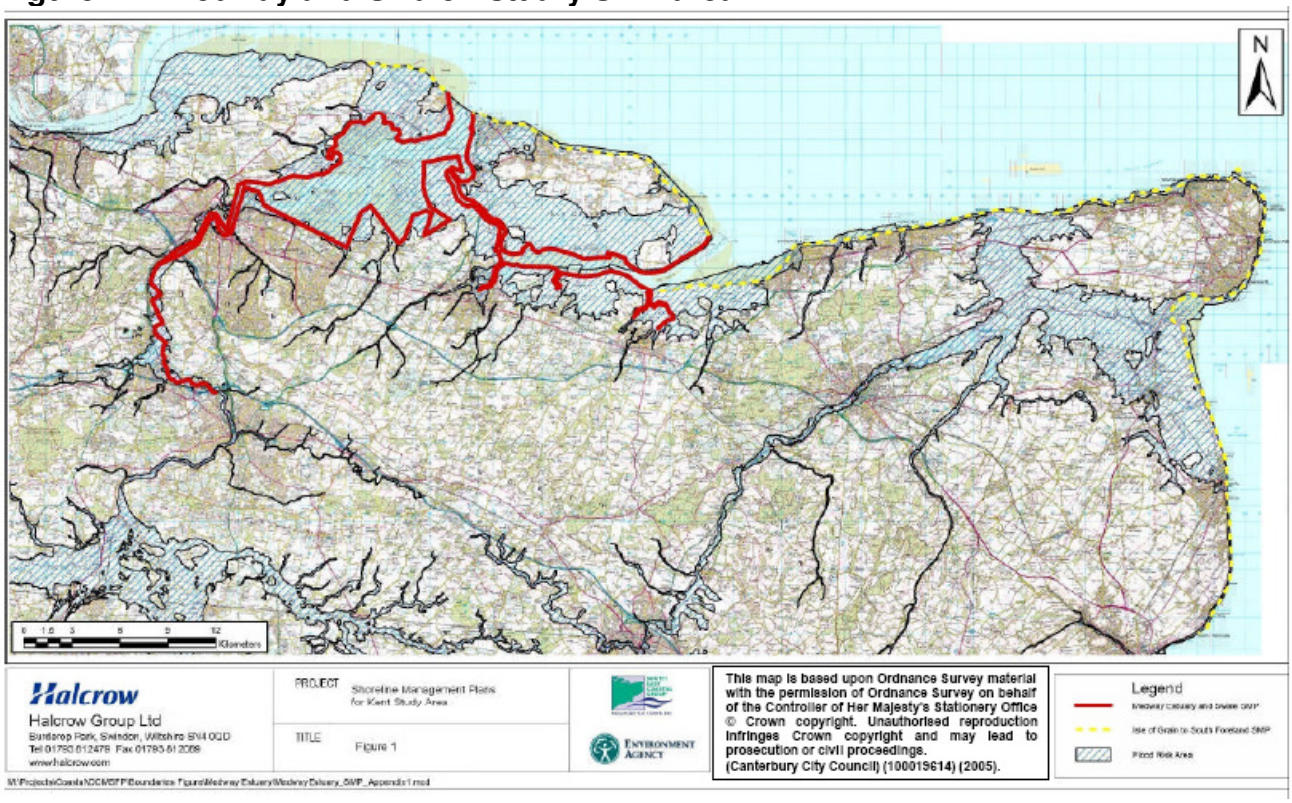


Figure 1.2. Medway and Swale Estuary SMP area



The Directive recognises that some waterbodies have been significantly physically modified to support various uses which provide valuable social and economic benefits, for example Flood Risk Management activities to protect urban areas or agricultural land. In cases where the modifications for achieving 'Good Status' would require changes to a water body's hydromorphology that would have significant adverse effects on the social or economic activity, the waterbody is designated as artificial or heavily modified. In these cases, those water bodies will have to achieve an alternative objective of at least "Good Ecological Potential" (GEP). These waterbodies will still need to achieve Good chemical status, and the chemical elements under Good ecological status. The classification results already found in the South East and Thames RBMPs define the surface water objectives for the ecological status or potential, and chemical status.

Waterbodies within the SMP area are listed in Table 1.1, along with whether or not they are heavily modified.

Table 1.1 Waterbodies within the SMP

Name	Heavily Modified Water Body
Medway transitional and coastal waters (TRAC)	Yes
Swale TRAC	Yes
Inland rivers	Out of 10 inland rivers identified, 8 have not been assessed yet under the RBMP*. The 2 that have been assessed are identified as heavily modified
Inland lakes (Merston Lakes)	Not assessed yet under the RBMP* and therefore not included in this assessment
Groundwaters	-

*NB.Some waterbodies have not yet been assessed under the RBMP, and can therefore not be included in this assessment. However, assessment of such waterbodies is part of an ongoing programme under the WFD, and future mitigation measures identified for them should be incorporated into strategies, schemes and SMP reviews.

Significant Issues in the Thames River Basin District

The draft Thames RBMP has identified significant issues affecting water management within the river basin district which have been grouped under the following headings:

- Flow problems
- Physical modification
- Diffuse pollution- rural
- Urban development
- Diffuse pollution- urban and transport
- Alien Species
- Point source pollution

A number of catchment wide actions have been identified to tackle these issues:

- Improving rural land management
- Reducing the impact of transport and the built environment
- Managing future development
- Securing sustainable amounts of water
- Improving wildlife habitats
- Addressing localised sources of pollution

Mitigation measures to achieve Good Ecological Potential

For those waterbodies identified as heavily modified, a number of mitigation measures have been set for each to ensure that the GEP objectives are met (see tables in section 4). The SMP must ensure that it contributes towards meeting WFD objectives, and at least does not detract from any objectives being met, whilst still meeting the high level objectives of the SMP, as listed in Box 1.

BOX 1: SMP Objectives

- To define in general terms, the flooding and erosion risks to people and the developed, historic, and natural environment within the SMP area over the next century
- To identify the preferred policies for managing those risks
- To identify the consequences of implementing the preferred policies
- To inform planners, developers and others of the risks identified within the SMP and preferred SMP policies when considering future development of the shoreline and land use changes
- To comply with the international and national nature conservation legislation and biodiversity obligations

2 Method

During the classification exercise of HMWB for Flood Risk Management in Transitional and Coastal (TRAC) waters, all potential mitigation measures were evaluated, and the Medway and Swale Estuary SMP policies were included in the process to highlight if any of the mitigation measures proposed could be in disagreement with SMP policies. As a result of this process it was ensured there are no conflicts between the GEP mitigation measures and SMP policies.

A final check was undertaken on completion of the SMP to ensure that the SMP's policies comply with the objectives of the RBMP and do not have any negative implication on the ability of the measures identified in the RBMP to be implemented. This assessment is documented in section 4 of this appendix. Where appropriate, positive influences are identified, whereby the SMP contributes positively to the RBMP measures or objectives being met. Actions or measures proposed in the RBMP for waterbodies within the SMP area, were considered against the policies proposed for the SMP units. Each mitigation measure under each waterbody was assessed as being positively, negatively or neutrally affected by the SMP policies for that waterbody. This assessment is high level and based on qualitative information and professional judgement.

Implementation of SMPs policies:

More detailed implications will be considered at Strategy and scheme level; as the SMP policies are implemented. To ensure the SMP is compliant with WFD two key steps will be necessary:

1) Plans, strategies or schemes under the SMP will need to incorporate mitigation measures included in the RBMP. Further information from WFD classification and monitoring (e.g. saltmarsh tool) will provide additional information on the status of the water bodies under the SMPs. These will be considered when scoping Strategic Environmental Assessment methodology.

2) All water bodies have a default 'no deterioration' objective, including those not considered at risk of failing. Current FRM mitigation measures that are already in place and aligned with WFD requirements will need to be maintained to ensure no deterioration will occur. Also, any potential flood risk management activities that could affect the chemical status of the site will need to be evaluated.

In cases where new developments are needed because of socio-economic drivers, and these cause the temporary deterioration of the waterbody, then plans/schemes and strategies will need to ensure all practicable steps are taken to mitigate adverse effects, including water quality negative effects. This will need to be documented in the River Basin Management Plan.

3 Habitats Regulations

The Medway and Swale Estuary SMP has the potential to affect the following nature conservation sites of European importance:

- The Thames Estuary and Marshes Ramsar/Special Protection Area
- Medway Estuary and Marshes Ramsar/Special Protection Area
- Swale Ramsar/Special Protection Area
- Peter's Pit Special Area of Conservation

Consequently the requirements of the European Union Habitats Directive (92/43/EEC) and European Union Birds Directive (79/409/EEC) as implemented in the UK through the Conservation (Natural Habitats &c) Regulations 1994, have been addressed. A full Habitats Regulations Assessment (HRA) has been prepared for the SMP (Appendix J). Natura 2000 sites are protected areas under WFD and any measures needed to achieve the conservation status of the site will be included in the mitigation measures.

4 Assessment against RBMP actions and objectives

The following tables present the assessment of the SMP policies against the RBMP objectives and actions relating to the waterbodies within the SMP area.

Table 4.1- Medway

Waterbody: Medway GB530604002300 **HMWB: Yes** **SMP policy units: E1-20, E28-29**			
Pressure	**Mitigation Measure**	**Does the SMP have positive, negative or neutral effect on the mitigation measure?**	**Comments**
Shoreline reinforcement/bank reinforcement	Removal of hard engineering structures (eg naturalisation) or replacement with soft engineering solution	Positive	8 policy units include some managed realignment in Epoch 1, and a further 4 in Epoch 2. This is expected to present opportunities to replace hard structures with softer solutions in retreated positions.
	Managed realignment of flood defence	Positive	8 policy units include some managed realignment in Epoch 1, and a further 4 in Epoch 2.
	Restore/create/enhance aquatic and marginal habitats	Positive	Managed realignment policies will provide opportunity to enhance habitats. There are also 3 policy units with a policy of no active intervention which may also result in habitat enhancement.
	Indirect/offsite mitigation (offsetting measures)	Neutral	
Impoundment (locks sluices and tidal barrages)	Removal of obsolete structure	Neutral	
	Operational and structural changes to locks, sluices and tidal barrages	Neutral	
	Indirect/offsite mitigation (offsetting measures)	Neutral	

Table 4.2 Swale

Waterbody: Swale GB530604011500 **HMWB: Yes** **SMP policy units: E21-27**			
Pressure	**Mitigation Measure**	**Does the SMP have positive, negative or neutral effect on the mitigation measure?**	**Comments**
Shoreline reinforcement/bank reinforcement	Removal of hard engineering structures (eg naturalisation) or replacement with soft engineering solution	Positive	The SMP identifies 2 units where managed realignment is possible in Epoch 1, and 2 units in Epoch 2. This is expected to present opportunities to replace hard structures with softer solutions in retreated positions.
	Bank rehabilitation/reprofiling	Positive	Opportunities are likely to arise in association with realignment policies
	Managed realignment of flood defence	Positive	The SMP identifies 2 units where managed realignment is possible in Epoch 1, and 2 units in Epoch 2.
	Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone	Positive	Opportunities are likely to arise in association with realignment policies

Table 4.3 South Faversham

Waterbody: Inland Water Body (River) GB106040018530 S. Faversham HMWB: Yes SMP policy units:E23/24			
Pressure	**Mitigation Measure**	**Does the SMP have positive, negative or neutral effect on the mitigation measure?**	**Comments**
Channel Alteration (realignment/reprofiling/ regrading), causing loss of morphological diversity and habitat	Increase in channel morphological diversity, eg install instream features; 2 stage channels	Neutral in years 0-20 and positive from year 20	HTL in Epoch 1 will have no effect but there is potential for a future positive effect from managed realignment in Epoch 2.
	Retain marginal aquatic and riparian habitats (channel alteration)	Neutral in years 0-20 and positive from year 20	HTL in Epoch 1 will have no effect but there is potential for a future positive effect from managed realignment in Epoch 2.
Channel alteration (culverts), causing loss of morphological diversity and habitat	Alteration of channel bed (within culvert)	Neutral	
Bank and bed reinforcement in channel structures (dams, sluices etc), causing interference with fish movements	Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works	Neutral	
	Operational and structural changes to locks, sluices, weirs, beach control	Neutral	
Bank and bed reinforcement in channel structures (hard protection) causing loss of riparian zone/connectivity	Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone	Neutral in years 0-20 and positive from year 20	HTL in Epoch 1 will have no effect but there is potential for a future positive effect from managed realignment in Epoch 2.

Table 4.3 South Faversham cont'd

Pressure	Mitigation Measure	Does the SMP have positive, negative or neutral effect on the mitigation measure?	Comments
Operations and maintenance – vegetation control causing physical disturbance	Selective vegetation control technique	Neutral	
	Appropriate vegetation control technique	Neutral	
	Appropriate timing (vegetation control)	Neutral	
	Appropriate techniques (invasive species)	Neutral	
Operations and maintenance- removal of urban trash and woody debris causing loss of aquatic habitats	Appropriate channel maintenance strategies and techniques- minimise disturbance to channel bed and margins	Neutral	
Urbanisation, causing changes to vegetation, hydrology and sediment supply	Educate landowners on sensitive management practices (urbanisation)	Neutral	

Table 4.4 Iwade

Waterbody: Inland Water Body GB106040018600 Iwade HMWB: Yes SMP policy unit:E20			
Pressure	**Mitigation Measure**	**Does the SMP have positive, negative or neutral effect on the mitigation measure?**	**Comments**
Channel alteration (realignment/reprofiling/ regarding, causing loss of morphological diversity and habitat	Increase in-channel morphological diversity	Positive	Managed realignment from year 0 will provide potential for enhancement of diversity
	Retain marginal aquatic and riparian habitats (channel alteration)	Positive	Managed realignment policy provide opportunity to improve marginal aquatic and riparian habitats
Channel alteration (culverts), causing continuity problems	Re-opening existing culverts	Neutral	
	Alteration of channel bed (within culvert)	Neutral	
Floodplain modification (flood banks and walls), causing loss of riparian zone etc	Flood bunds (earth banks, in place of floodwalls)	Positive	Managed realignment policy provides opportunity to replace defences with softer structures (eg flood bunds) in retreated position.
	Set bank embankments	Positive	Managed realignment provides opportunity to set back embankments
	Improve floodplain connectivity	Positive	Managed realignment will assist this measure
Bank and bed reinforcement/in channel structures (dams, sluices, weirs etc), causing loss of biological continuity and interference with fish movement	Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works	Neutral	
	Operational and structural changes to locks, sluices, weirs, beach control	Neutral	

Table 4.4 Iwade cont'd

Pressure	Mitigation Measure	Does the SMP have positive, negative or neutral effect on the mitigation measure?	Comments
Operations and maintenance- vegetation control, causing physical disturbance	Selective vegetation control technique	Neutral	
	Appropriate vegetation control technique	Neutral	
	Appropriate timing (vegetation control)	Neutral	
	Appropriate techniques (invasive species)	Neutral	
Operations and maintenance –removal of urban trash and woody debris, causing loss of aquatic habitats	Appropriate channel maintenance strategies and techniques- minimise disturbance to channel bed and margins	Neutral	

Table 4.5 Groundwater

Waterbody: Groundwater bodies			
Groundwater body number and name	**Groundwater interactions with tidal waters**	**Does the SMP have positive, negative or neutral effect on the groundwater?**	**Comments**
GB40504G999900 Unproductive strata	The areas of clay have not been classified as Groundwater Bodies and are all considered "Unproductive Strata". Local scale interactions with the soil zone and saline water are likely but this will not alter any Water Framework Directive classifications for groundwater bodies for quality or for resources.	Neutral	
GB40602G500200 North Kent Tertiaries	The implications on groundwater quality of changes along the coast on the risk by saline intrusion for Groundwater Body GB40602G500200 have not been assessed to date as there are no groundwater quality monitoring points. It has therefore been Classified as Good Status by default for the saline intrusion tests. Changes associated with inundation due to sea level rise or managed retreat options alone are considered as "allowing / returning to" natural conditions so will not result in a change in the status.	Neutral	Managed retreat options in E15, 17, 18 and 20 in years 0-20 will be considered 'returning to natural conditions'.
GB40601G501700 North Kent Swale Chalk	The majority of Groundwater body GB40601G501700, as it is depicted for the first round of the WFD River Basin Management Plan, is not at risk from saline intrusion or impact as it lies inland. Only a small section to the west borders the coastline / estuary. For this small section further changes associated with inundation due to sea level rise or managed retreat options alone are considered as "allowing / returning to" natural conditions so will not result in a change in the status.	Neutral	There will be no change as the SMP policy for the coastal stretch of this groundwater body is hold the line.

Groundwater body number and name	Groundwater interactions with tidal waters	Does the SMP have positive, negative or neutral effect on the groundwater?	Comments
Not yet named – but an extension to GB40601G501700 (North Kent Swale chalk) which extends beneath GB40602G500200 (North Kent Tertiaries) to the coast. To be considered in the second planning cycle of the WFD RBMP (2015-2021).	The Groundwater Bodies were only considered in plan view, 2 dimensions, for the first round of the WFD. It is recognised that GB40601G501700 North Kent Swale Chalk extend beneath GB40602G500200 the North Kent Tertiaries all the way to the coast and beneath the estuary. This will be considered in future rounds. The Chalk groundwater does interact with the saline water in the estuary when groundwater abstractions inland are operated. This has not been assessed for WFD purposes as it was not classified as a Groundwater Body, but it is known to be influenced. Likewise, in 2007/8 one of the major industrial abstractions ceased operating leading to a rise in groundwater levels beneath Sittingbourne. The groundwater quality also changed slightly, becoming less saline. It is expected that this situation will give rise to greater volumes of fresh water discharging to the estuary in future years. As the groundwater is higher the frequency of flow events in the inland bournes is likely to increase. It will be important to allow for this in the design of future shoreline management options.	Neutral – provided mitigation implemented as detailed in comments column	At present this area is due for "hold the line" so it will be important that the schemes allow the movement of groundwater out to the estuary (rather than building up behind flood walls). To be considered in implementation stages of the SMP and future SMP reviews.
GB40601G500300 North Kent Medway Chalk	The area covered by the SMP adjacent to the North Kent Medway Chalk GWB is purely along the banks of the River Medway. The interaction of the groundwater and surface water is variable along the length. At present this GWB is classified as Good Status for the saline intrusion test carried out for groundwater quality. Theoretically some borehole abstractions may be impacted if sea levels rise or abstraction rates increase and this will be assessed in future River Basin Management Plan cycles (where climate change will be taken into consideration). In the meantime, changes associated with inundation due to sea level rise or managed retreat options alone are considered as "allowing / returning to" natural conditions so will not result in a change in the status.	Neutral	There is a mixture of Hold the Line and Managed realignment policies within this groundwater body. Managed realignment is proposed for E8 and E11 in years 0-20. This will be considered 'returning to natural conditions'.

Groundwater body number and name	Groundwater interactions with tidal waters	Does the SMP have positive, negative or neutral effect on the groundwater?	Comments
GB40601G500400 Kent Greensand Middle	The tidal Medway crosses a section of the GB40601G500400 Kent Greensand Middle groundwater body. The groundwater quality tests for saline intrusion carried out for the WFD did not show any adverse impact at abstraction points or any deteriorating trend that could be fully attributed to impact from the tidal stretches (There are other local influences such as salt storage). Interaction with the groundwater is known to occur (visible in natural fractures in the rock) in parts and will be assessed in the future.	Neutral	SMP policy in E9 is Hold the line so there will be no change on the current situation.

5 Conclusion

Overall the policies of the SMP have a neutral or positive effect on the WFD measures; particularly in policy units where managed realignment is proposed in Epoch 1 or 2. This will help the RBMP implement its mitigation measures and assist in meeting the WFD objectives. There are no policies proposed by the SMP that have a detrimental effect on the RBMPs measures and their ability to meet the WFD objectives.

Future reviews of the SMP will take into consideration any monitoring that will come out of the RBMP implementation and will consider new findings and measures identified in the next review of the RBMP. This will ensure that both plans assist each other in meeting their objectives.