

Appendix K

Water Framework Directive assessment

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Glossary

AA	Appropriate Assessment
ATL	Advance the line
AWB	Artificial Water Body
BQE	Biological Quality Element
CFMP	Catchment Flood Management Plan
EU	European Union
FWB	Freshwater Body
GWB	Groundwater Body
HMWB	Heavily Modified Water Body
HTL	Hold the line
MR	Managed realignment
NAI	No active intervention
RBD	River Basin District
RBMP	River Basin Management Plan
ROPI	Reasons of Overriding Public Interest
SEA	Strategic Environmental Assessment
SMP	Shoreline Management Plan
SPZ	Source Protection Zone
UKBAP	United Kingdom Biodiversity Action Plan
WFD	Water Framework Directive
TraC water bodies	Transitional and Coastal Water Bodies
WPM	With Present Management

K1 INTRODUCTION

K1.1 Purpose of Report

The Water Framework Directive (referred to in this report as the Directive) came into force in 2000 and is the most substantial piece of EU water legislation to date. The Directive will need to be taken into account in the planning of all new activities in the water environment. Therefore, the Environment Agency (the competent authority in England and Wales responsible for delivering the Directive) has recommended that decisions setting policy, including large-scale plans such as Shoreline Management Plans (SMPs), take account of the requirements of the Directive.

This assessment has been undertaken according to the guidance on 'Assessing shoreline management plans against the requirements of the Water Framework Directive' (Environment Agency, 2009). This guidance describes the methodology for assessing the potential hydromorphological change and consequent ecological impact of SMP policies and ensuring that SMP policy setting takes account of the Directive.

The Wash SMP2 policy options were agreed in June 2009 and it has not therefore been feasible for the Water Framework Directive assessment to influence the SMP2 policy development. Consequently this report provides a retrospective assessment of the policies defined in the Wash SMP2 with the purpose of highlighting future issues for consideration at policy implementation stage.

K1.2 Background

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 requirements of the Directive need to be considered at all stages of the river and coastal planning and development process. For the purposes of large-scale plans, such as SMPs, the consideration of the requirements of the Directive when setting and selecting policies must be necessarily high level but set the framework for future delivery of smaller-scale strategies or schemes.

The Directive requires that Environmental Objectives be set for all surface and groundwaters in each EU member state. The default Environmental Objectives of relevance to the SMP2 are shown in table 1.1.

Specific mitigation measures will be set for each River Basin District (RBD) to achieve the Environmental Objectives of the Directive. These measures are to mitigate impacts that have been or are being caused by human activity. In other words, measures to enhance and restore the quality of the existing environment. These mitigation measures will be delivered through the River Basin Management Plan (RBMP) process and listed in a Programme of

Measures within the RBMP. The final versions of the RBMPs were produced in December 2009.

Table 1.1 Environmental Objectives in the Directive

Objectives (taken from Article 4 of the Directive)	Reference
Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water.	4.1(a)(i)
Member States shall 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.	4.1(a)(ii)
Member States shall 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.	4.1(a)(iii)
Progressively reduce pollution from priority substances and cease or phase out emissions, discharges and losses of priority hazardous substances.	4.1(a)(iv)
Prevent Deterioration in Status and prevent or limit input of pollutants to groundwater.	Ground Water 4.1(b)(i)

Source: Environment Agency (2009)

K1.2.1 Preventing deterioration in Ecological Status or Potential

As stated in table 1.1, a default Objective in all water bodies is to prevent deterioration in either the Ecological Status or, for HMWBs or AWBs, the Ecological Potential of the water body. Any activity which has the potential to have an impact on ecology (as defined by the biological, physico-chemical and hydromorphological Quality Elements listed in Annex V of the Directive) will need consideration in terms of whether it could cause deterioration in the Ecological Status or Potential of a water body. It is, therefore, necessary to consider the possible changes associated with each SMP2 policy for each water body within the SMP2 area so that a decision making audit is available should any later failure to meet the Environmental Objectives need to be defended, and issues for consideration when implementing policy are highlighted.

K1.2.2 Achieving objectives for EU protected sites

Where there are sites protected under EU legislation (e.g. the Birds or Habitats Directives, Shellfish Waters Directive), the Directive aims for compliance with any relevant standards or objectives for these sites. Where a site which is water-dependent in some way is protected under another EU Directive but the Good Ecological Status or Good Ecological Potential targets (set under the Water Framework Directive) would be insufficient to meet its objectives, the more stringent targets would apply.

K2 ASSESSMENT METHODOLOGY

The methodology devised for this assessment follows the guidance for the assessment of SMPs under the Water Framework Directive, produced by the Environment Agency (see section K1.1). The process has been broken down into a series of clearly defined steps, broadly following the tasks and activities described within the Defra guidance on producing SMPs (Defra, 2006), to provide a transparent and accountable assessment of the SMP2 policies. The Water Framework Directive assessment process for SMPs is shown in figure 2.1 and these steps are described in detail in the sections below.

As the policy options have already been set for this SMP2, a retrospective assessment of the policies in relation to the Directive has been undertaken. It has not been practicable to influence the SMP2 policy development or consider opportunities for delivering mitigation measures from the RBMP.

K2.1 Scoping the SMP2 – Data Collation

All Transitional and Coastal (TraC) water bodies present within the Wash SMP2 area were identified and their ID numbers, designation and classification details obtained from the Environment Agency.

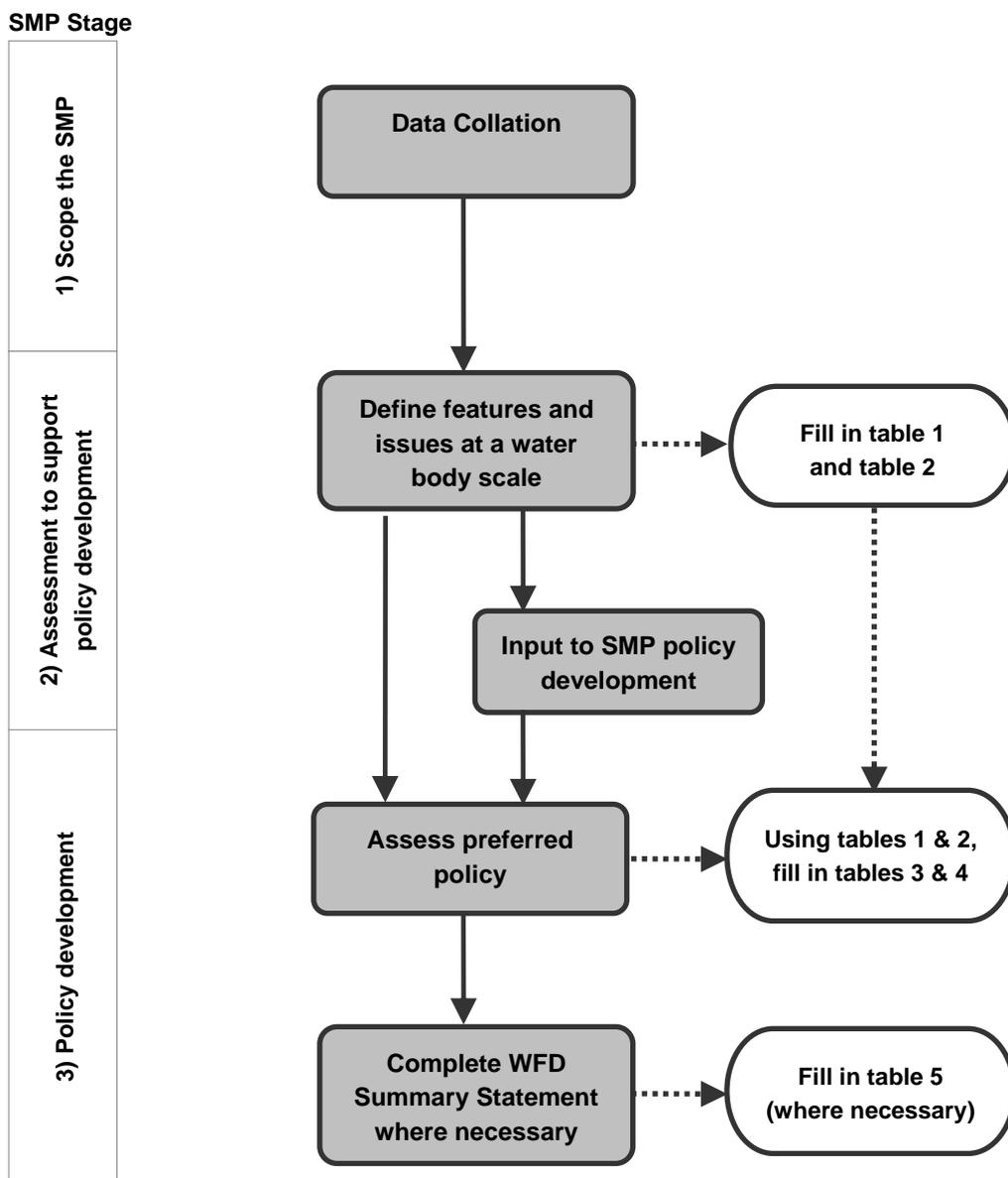
The generic Environmental Objectives set out below (based on Article 4.1 of the Directive and as described in table 1.1) will be used for the assessment of the SMP in relation to the Directive.

- WFD1: No changes affecting high status sites;
- 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;
- WFD3: No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies; and
- WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration groundwater status.

Where available, the specific proposed status objectives for the water bodies within the Wash SMP2 area were also identified from the RBMP for the Anglian RBD, obtained from the Environment Agency's website¹. However, for some water bodies in the SMP2 area, the current overall status and objectives have not yet been assessed.

¹ The RBMPs are available at <http://www.environment-agency.gov.uk/research/planning/33106.aspx>

Figure 2.1 Water Framework Directive assessment process for SMPs



Source: Environment Agency (2009)

The Environment Agency web-based 'Flood Map'² was used to assess whether there are any landward freshwater bodies (FWBs) that have the potential to be influenced by SMP2 policies and which should, therefore, be covered within this assessment. The names, ID numbers, designation and classification details for any such freshwater bodies were obtained from the Environment Agency.

Groundwater bodies (GWBs) that could potentially be impacted by SMP2 policies were also identified by reviewing the Water Framework Directive compliance mapping for groundwater risk (known as River Basin Characterisation 2 (RBC2) and status assessment). Using the RBC2 mapping and the Water Framework Directive status maps for saline intrusion obtained from the Environment Agency, the GWBs designated as being 'at risk', 'probably at risk' or at 'Poor Status' within the SMP2 area were identified. The locations of groundwater abstractions with Source Protection Zones (SPZs) within the SMP2 area were also obtained from the Environment Agency's website.

Any discrepancies between water body boundaries and SMP2 boundaries were examined and any locations where changes would be recommended to attain consistency with water body boundaries were identified. It was also determined at this stage whether there were any additional investigations, such as studies to address the zone of influence in terms of Biological Quality Elements (BQEs), that could be recommended for the next round of SMPs to inform the Water Framework Directive assessment,

K2.2 Defining Features and Issues

The Water Framework Directive features which SMP2 policies may affect are the Biological Quality Elements (BQEs) of water bodies. The issues are the hydromorphological and physical parameters (upon which the BQEs are dependent) that could potentially be changed.

As part of the Wash SMP2 policy development process, baseline scenarios were developed which provide an appreciation of how the shoreline is behaving and the influence of coastal management on this behaviour. The baseline response assessments are described for the No active intervention (NAI) and With Present Management (WPM) scenarios (see section 2.3 of the Wash SMP2 report). These baseline scenarios were used in this assessment to identify how the SMP2 policies could affect the Water Framework Directive features. For all TraC water bodies in the SMP2 area the hydromorphological parameters that potentially could be changed by SMP2 policies, with potential impact on the BQEs present, were identified using Assessment Table 1.

² The Environment Agency's Flood Map is available at <http://www.environment-agency.gov.uk/floodmap>

The key features and issues identified in Assessment Table 1 were then transferred into Assessment Table 2 and the water body classification and Environmental Objectives set out in section K2.1 were used to populate the final column of Assessment Table 2.

K2.3 Assessment of the SMP2 Policy against the Environmental Objectives

The assessment of SMP2 policies against the Environmental Objectives was supported by a tabulated account based on the Summary of Specific Policies for each Policy Development Zone (PDZ) within the Wash SMP2 (see section 4 of the Wash SMP2 report and section K3.1.4 of this appendix). Using the information on the water body features and issues defined in Assessment Tables 1 and 2, the potential impacts of the SMP policy for each PDZ was assessed in relation to aspects of the Directive and recorded in Assessment Table 3. For each PDZ, the potential changes to the relevant physical and hydromorphological parameters that might occur as a result of the SMP policy were identified. The impacts of climate change on baseline processes were also taken into account when assessing all epochs. The assessment of deterioration with respect to the Directive considered the impact of any changes to the TraC surface water body features (BQEs) that were identified in Assessment Table 2.

The assessment of SMP2 policies also included consideration of the potential for impact upon the landward freshwater bodies identified during the data collation phase as having the potential to be influenced by SMP2 policies (see section K2.1). Landward freshwater bodies could potentially be impacted where the SMP2 policy for a PDZ is No active intervention (NAI) or Managed realignment (MR) as these policy options could result in saline inundation of freshwater habitats and, hence, could potentially impact upon the freshwater biology.

In addition, the assessment of SMP2 policies in Assessment Table 3 also included consideration of the potential for impact on GWBs. Particular attention was paid to PDZs where the SMP2 policy is NAI or MR as these policies could potentially result in the saltwater – freshwater interface moving landward, which, coupled with abstraction pressures, could result in saltwater intrusion and deterioration of the GWB. For these PDZs, the extent of groundwater abstractions was identified through the use of Zone 3 (total catchment of the groundwater abstraction) of the SPZ. Where Zone 3 of an abstraction was found to extend to the coastline, or where it extended to the long-term (100 years) predicted shoreline, it was considered that an SMP2 policy could potentially cause deterioration in the quality of the abstraction due to saline intrusion. Consideration was also given to the potential for SMP2 policies to lead to deterioration in Status or Potential of the TraC water bodies as a result of groundwater pollution.

The assessment is structured to focus on the water body within which the SMP2 policy sits (typically a TraC water body). Impacts on other water bodies (including inland freshwater bodies) are considered within the discussion of Objective WFD3, and impacts on groundwater bodies are discussed within Objective WFD4, i.e. additional water bodies that may be affected are not separately presented within Assessment table 2 but are discussed in the context of objectives WFD3 and WFD4.

The outcomes of the assessment for each PDZ were then checked against the Environmental Objectives (as set out in section K2.1). For each PDZ, it was recorded in Assessment Table 3 whether the SMP2 policy has the potential to meet or fail the Environmental Objectives. Following the assessment of SMP2 policies for each PDZ, a summary of the achievement (or otherwise) of the Environmental Objectives was completed at the water body scale (Assessment Table 4).

Where it was identified that the Environmental Objectives may not be met for a PDZ and there is potential for deterioration in a water body, then the need for a Water Framework Directive Summary Statement was recorded in the final column of Assessment Table 4. The Summary Statement itself was completed for each of those necessary water bodies in Assessment Table 5.

K3 RESULTS

K3.1 Scoping the SMP2 – Data Collation

K3.1.1 Transitional and Coastal water bodies (TraC)

There are eight TraC water bodies within The Wash SMP2 area (figure 3.1). These include one Coastal water body (Wash Outer) and seven Transitional water bodies (Wash Inner, Wolferton Lagoon Complex, Steeping, Witham, Welland, Nene and Great Ouse). All of these are designated as Heavily Modified Water Bodies (HMWBs) except for the Wash Outer and the Wolferton Lagoon Complex which are 'not designated'. The first six water bodies are classified as being at Moderate Ecological Potential.. The Wash Outer and the Wolferton Lagoon Complex are classified as being at Moderate Ecological Status.

K3.1.2 Freshwater bodies (FWBs)

The flat, low-lying nature of The Wash hinterland means that significant areas are prone to coastal erosion and coastal flooding in the absence of defences. Examination of the 1 in 1000 year flood area indicates that this extends for a significant area inland, well beyond many existing settlements and infrastructure (figure 3.2). FWBs located within the 1 in 1000 year flood area are shown in figure 3.2 and listed in table 3.1. Within this risk area there are a large number of Artificial Water Bodies (AWBs) draining the high grade agricultural land, particularly between Gibraltar Point and the River Nene. The potential for impacts to inland freshwater water bodies is captured within Environmental Objective WFD3 within Assessment table 2.

Table 3.1 FWBs within the 1 in 1000 year flood zone and, hence, have the potential to be impacted by policies in the Wash SMP2

Freshwater body name (ID number)	Water body category	Catchment	Designation	Classification
Wainfleet Haven or Steeping River (GB105030062430)	River	Witham	AWB	Moderate Ecological Potential
Hobhole / Stonebridge (GB105030056270, GB105030056280, GB105030056290, GB105030056310, GB105030056330, GB105030056350, GB105030056370, GB105030056390)	River	Witham	AWB	Moderate Ecological Potential for GB105030056280, GB105030056290, GB105030056310, GB105030056330, GB105030056350, GB105030056370. Good Ecological Potential for GB105030056270, GB105030056390
Lymn – Steeping (GB105030056450)	River	Witham	AWB	Moderate Ecological Potential
Bell Water Drain (GB105030056430)	River	Witham	AWB	Moderate Ecological Potential
Hobhole Drain (GB105030056320, GB105030056420)	River	Witham	AWB	Moderate Ecological Potential for GB105030056320 Good Ecological Potential for GB105030056420
Fodder Dike (GB105030056400)	River	Witham	AWB	Good Ecological Potential
West Fen Drain (GB105030056460)	River	Witham	AWB	Moderate Ecological Potential
Maud Foster Drain (GB105030056790)	River	Witham	AWB	Moderate Ecological Potential
Witham (GB105030062420)	River	Witham	HMWB	Moderate Ecological Potential
South Forty Foot (GB105030051500, GB105030051510, GB105030056510)	River	Witham	AWB	Moderate Ecological Potential
North Forty Foot Drain (GB105030056680)	River	Witham	AWB	Good Ecological Potential
South Forty Foot Drain (GB105030056620, GB105030056640)	River	Witham	AWB	Moderate Ecological Potential
Frampton Town Drain	River	Witham	AWB	Moderate Ecological

Freshwater body name (ID number)	Water body category	Catchment	Designation	Classification
(GB105030056560)				Potential
Old Hammond Beck (GB105030056580, GB105030056600, GB105030056590)	River	Witham	AWB	Good Ecological Potential
New Hammond Beck (GB105030056570)	River	Witham	AWB	Moderate Ecological Potential
Clay Dike (GB105030056660)	River	Witham	AWB	Good Ecological Potential
Skerth Drain (GB105030056690)	River	Witham	AWB	Moderate Ecological Potential
Kyme Eau (GB105030056710)	River	Witham	AWB	Poor Ecological Potential
Billingham Skirth (GB105030056180)	River	Witham	AWB	Moderate Ecological Potential
Welland and Glen (GB105031050690, GB105031050730, GB105031050740, GB105031055750, GB105031055760, GB105031055520, GB105031055530, GB105031055550)	River	Welland	AWB	Moderate Ecological Potential for GB105031050690, GB105031050730, GB105031050740. Good Ecological Potential for GB105031055530, GB105031055750, GB105031055760, GB105031055520, GB105031055550.
Glen (GB105031050720)	River	Welland	AWB	Moderate Ecological Potential
Vernatt's Drain (GB105031050700)	River	Welland	AWB	Good Ecological Potential
Whaplode River (GB105031050710, GB105031055490)	River	Welland	AWB	Moderate Ecological Potential
Fleet Haven Outfall (GB105031055500)	River	Welland	AWB	Good Ecological Potential
Welland (GB105031050680)	River	Welland	AWB	Moderate Ecological Potential
Lutton Learn (GB105032050310)	River	Nene	AWB	Good Ecological Potential
South Holland Main Drain (GB105032050400)	River	Nene	AWB	Moderate Ecological Potential
North Level Main Drain (GB105032050390)	River	Nene	AWB	Good Ecological Potential
West Lynn Drain (GB105033047900)	River	North West Norfolk	AWB	Moderate Ecological Potential

Freshwater body name (ID number)	Water body category	Catchment	Designation	Classification
Babingley River (GB105033047620)	River	North West Norfolk	HMWB	Moderate Ecological Potential
Gaywood River (GB105033047680)	River	North West Norfolk	Not designated	Good Ecological Potential
Boat House Creek (GB105033047800)	River	North West Norfolk	Not designated	Moderate Ecological Potential
Ingol (GB105033053470)	River	North West Norfolk	HMWB	Moderate Ecological Potential
Heacham River (GB105033053480)	River	North West Norfolk	HMWB	Moderate Ecological Potential

Figure 3.1: TraC water bodies within the Wash SMP2 area

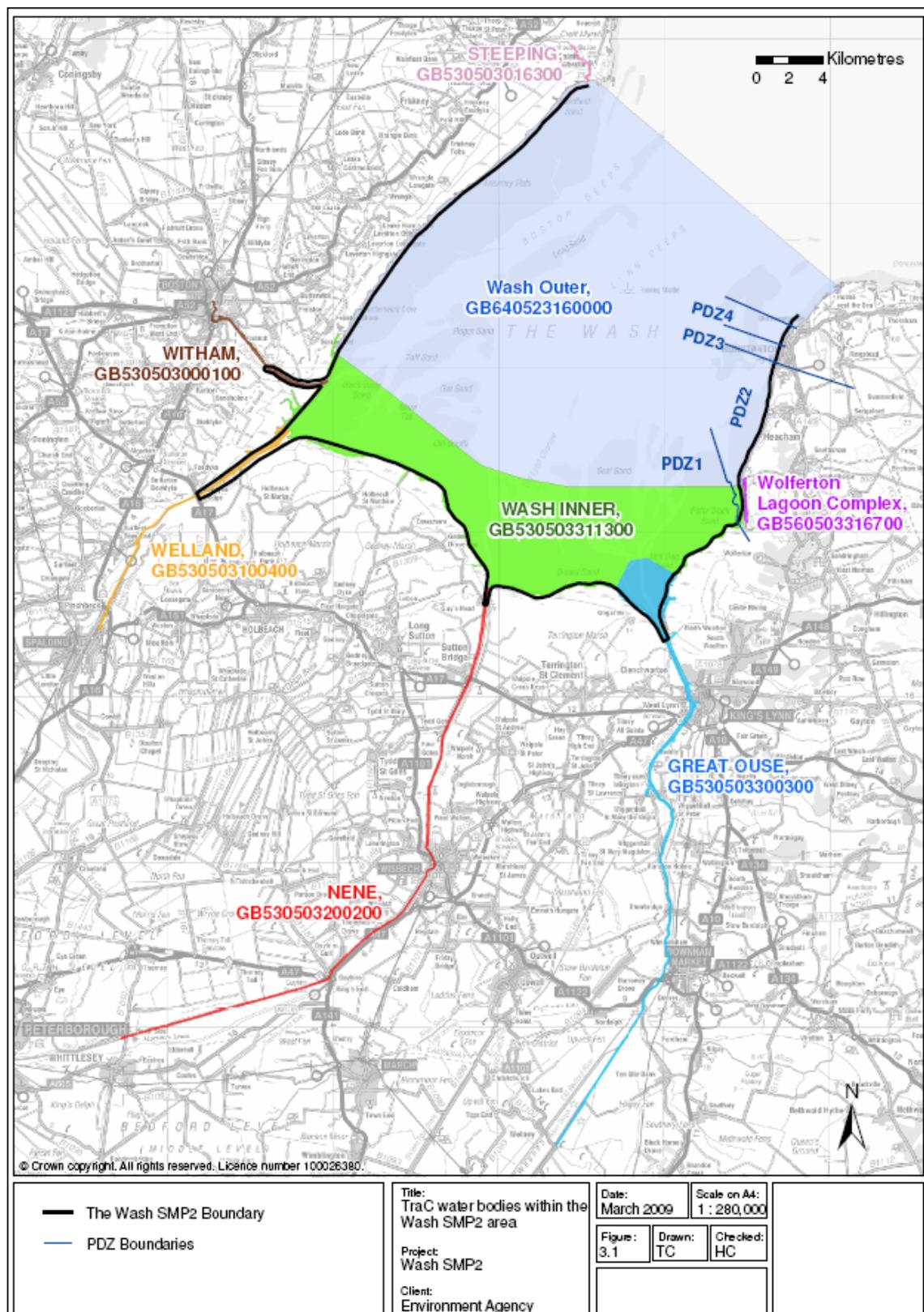
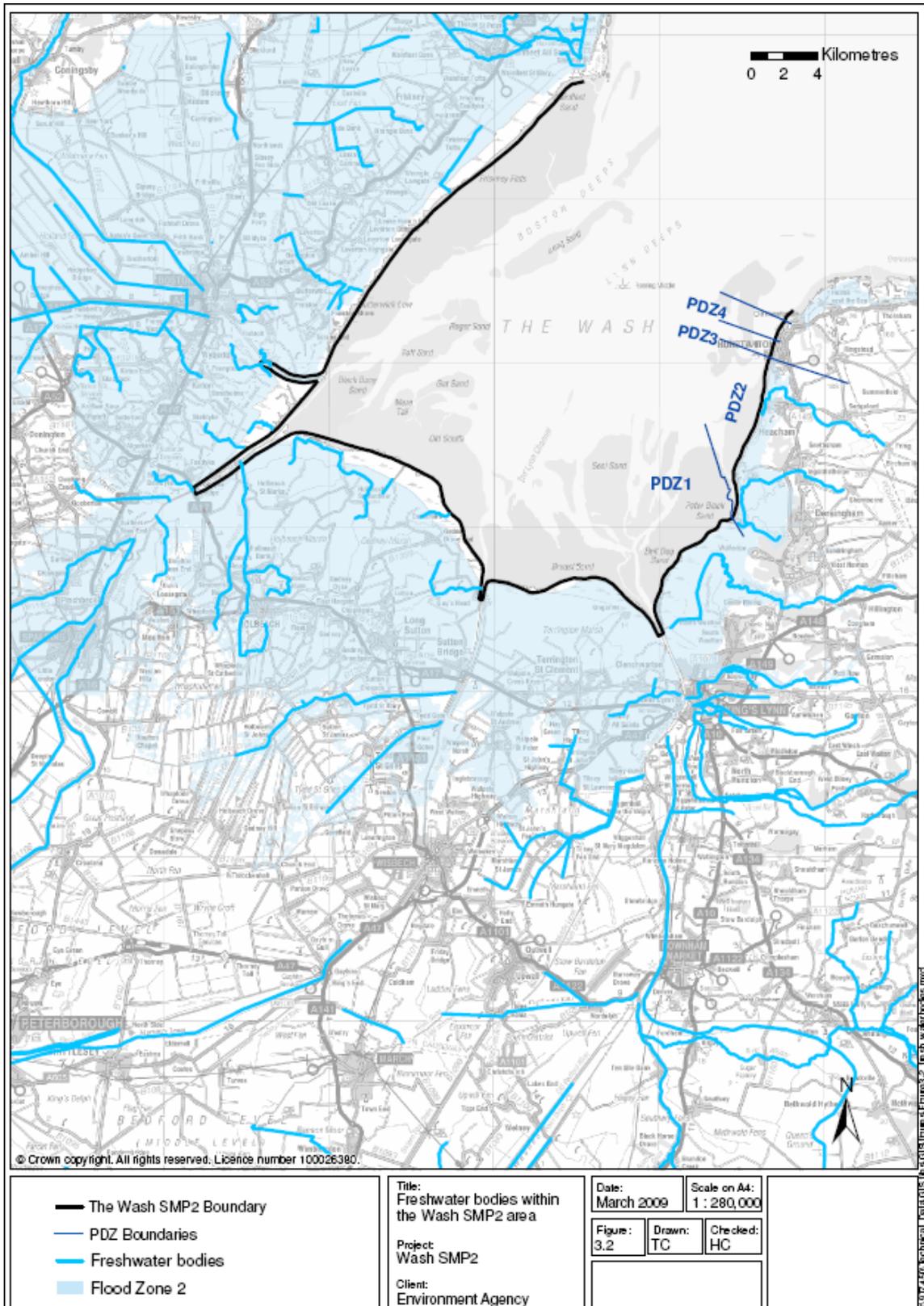


Figure 3.2: Freshwater bodies within the Wash SMP2



K3.1.3 Groundwater bodies (GWBs)

There are a total of six GWBs within The Wash SMP2 area. These GWBs are listed below and are illustrated in figures 3.3a and 3.3b. The GWB references on figures 3.3a and 3.3b comprise a short version of the ID listed below. For clarity, the short version has been highlighted in the list below (i.e. the short version of the Steeping Long Eau Little Eau Chalk Unit is G4016).

1. Steeping Long Eau Little Eau Chalk Unit (GB40201G401600);
2. Steeping Great Eau Long Eau / Witham Spilsby Sandstone (GB40501G401700);
3. Unproductive Strata (GB40504G999900);
4. North West Norfolk Sandringham Sands (GB40501G400400);
5. North West Norfolk Chalk (GB40501G400200); and
6. North Norfolk Chalk (GB40501G400100).

Figure 3.3a indicates the results of the WFD groundwater status assessment and figure 3.3b shows the River Basin Characteristic 2 (RBC 2) results. It should be noted that the large area of unproductive strata has not been assessed under RBC or WFD status assessment. Although these strata may contain groundwater, they have been defined as unproductive as the groundwater flow is considered to be insignificant in terms of water supply or ecosystems support. As such, SMP2 policies planned in the area of unproductive strata will not result in the failure to meet good groundwater status, or result in a deterioration of groundwater status. Therefore, unproductive strata have not been considered further in this assessment.

In the Wash SMP2 area, there are no GWBs designated at Poor status for saline intrusion. However, there are two which have been assessed as 'Probably At Risk', namely North Norfolk Chalk and Steeping Long Eau Little Eau Chalk Unit. These two GWBs are situated in PDZ4 and PDZ1, respectively.

The potential for impacts to groundwater bodies is captured within Environmental Objective WFD4 as described in Assessment tables 2 and 3.

Figure 3.3a: Groundwater bodies within the Wash SMP2

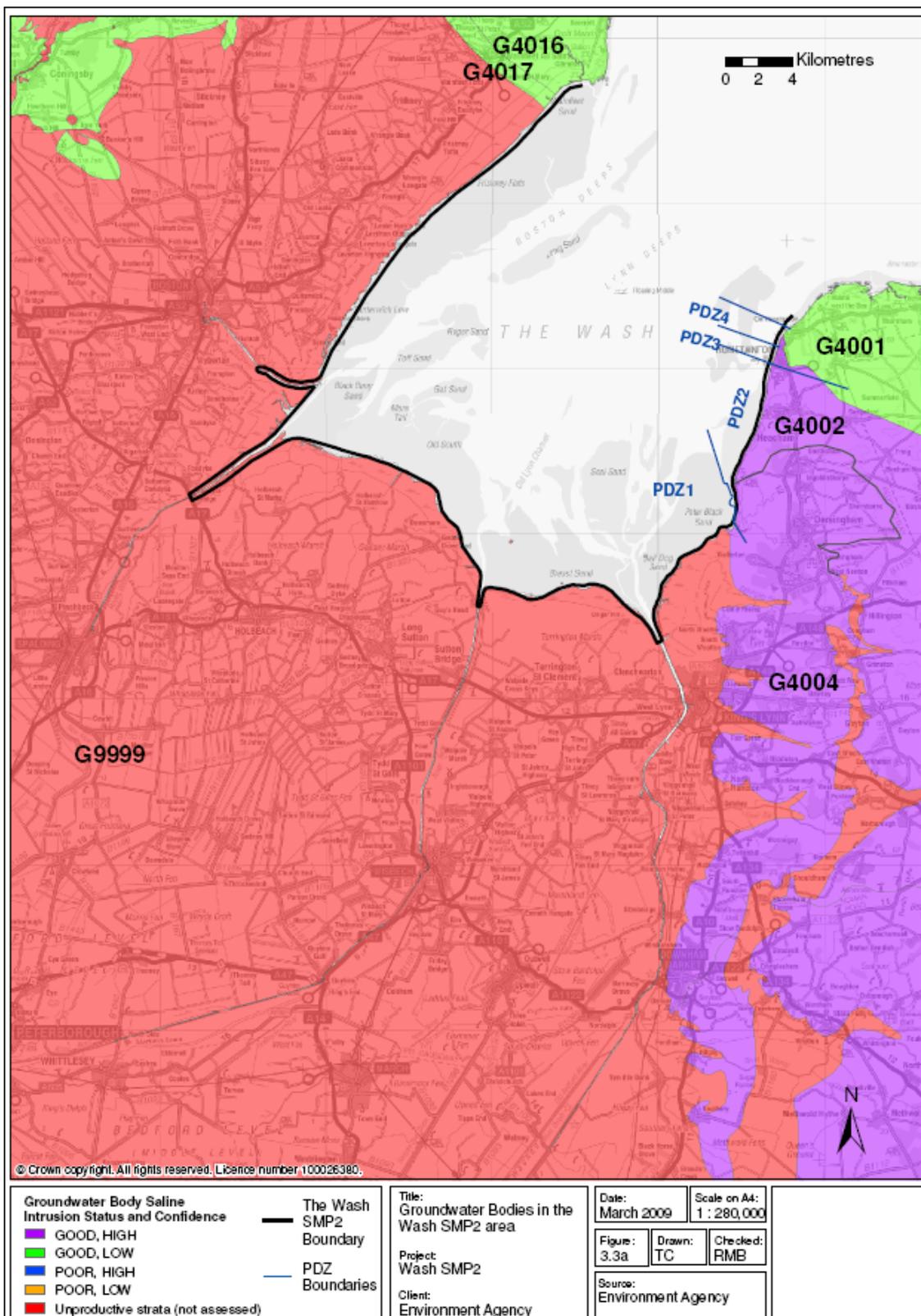
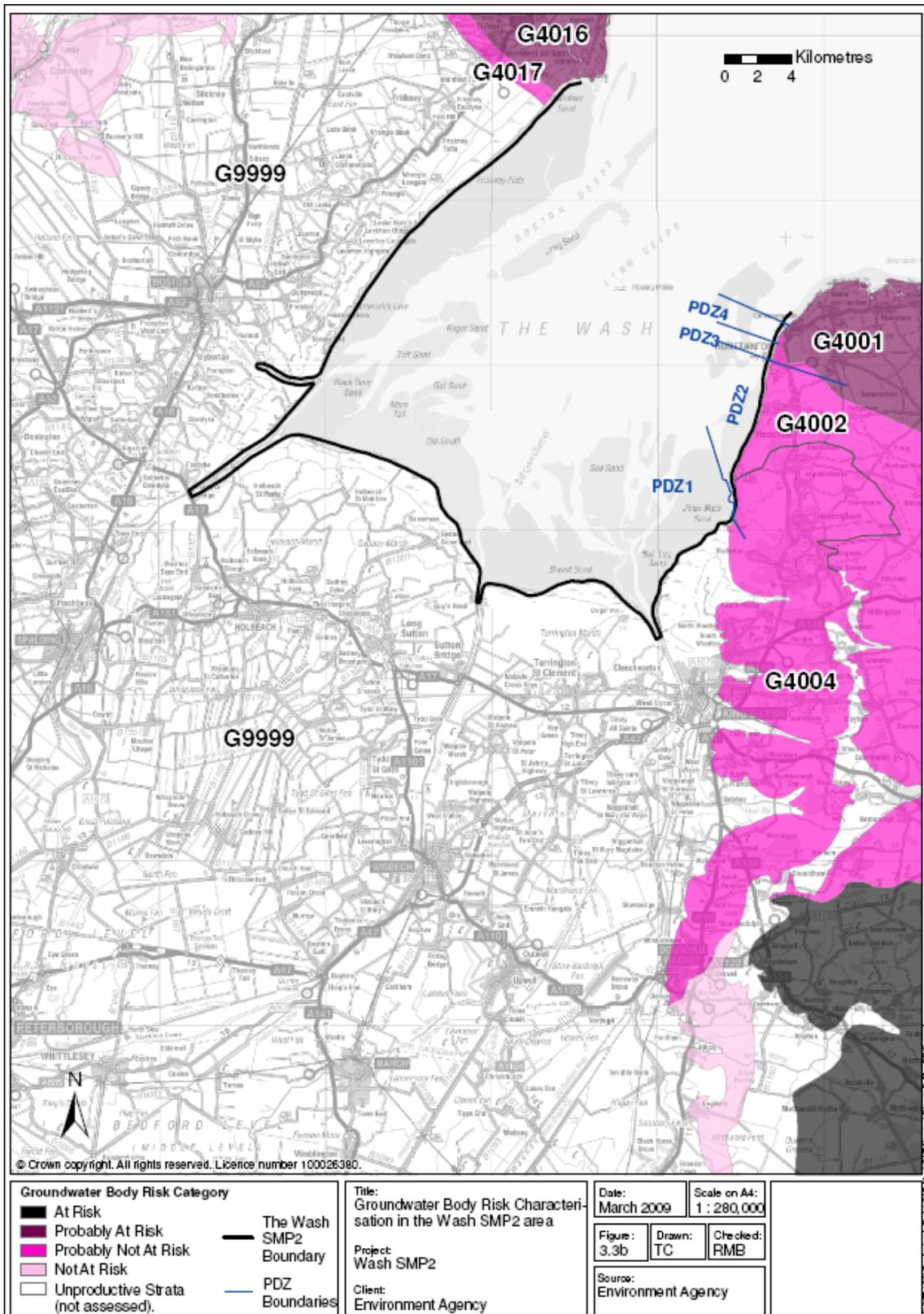


Figure 3.3b: Groundwater body risk characterisation within the Wash SMP2



K3.1.4 Boundary issues

The Wash SMP2 covers the frontage from south of Gibraltar Point up to and including the cliffs at Old Hunstanton. The north-west boundary of The Wash SMP2 is at the southern point of Gibraltar Point, along the right-hand bank of the Steeping River. The boundary between the Wash Outer and the Yorkshire South / Lincolnshire water bodies also lies at Gibraltar Point but the water body boundary falls in line with the Gibraltar Point spit system (figure 3.4a). The SMP2 boundary at this location has been set such that the Gibraltar Point spit system, which acts as a morphological break between the sandy beaches to the north and the saltmarshes and mudflats of The Wash to the south, is covered as a whole in the neighbouring Flamborough Head to Gibraltar Point SMP2. Therefore, it is not appropriate to adjust the SMP boundary at this location. However, in the next cycle of River Basin Management Planning, the water body boundary between the Wash Outer and the Yorkshire South / Lincolnshire water bodies could be considered for realignment to match the SMP2 boundary so that the spit system is contained entirely within the Yorkshire South / Lincolnshire water body.

The north-east boundary of The Wash SMP2 is at the north-eastern extent of the Old Hunstanton cliffs. This ensures that the cliffed shorelines at Hunstanton and Old Hunstanton, which both fall within the limits of The Wash system, are dealt with in the same SMP, while the dunes to the north are covered as a whole in the neighbouring North Norfolk SMP2 (figure 3.4b). However, The Wash Outer water body extends outside of the north-eastern SMP2 boundary for a short distance to Holme-next-the-Sea. Thus potential changes in this part of the Wash Outer water body have been checked as part of the North Norfolk SMP2 Water Framework Directive assessment (Royal Haskoning, 2009). For future cycles of River Basin Management Planning, realignment of this water body boundary could be considered to match the SMP boundary and so reflect the change from a cliffed shoreline within The Wash (i.e. within the Wash Outer water body) to dune systems along the North Norfolk coastline (i.e. within the Norfolk North water body).

During the development of policy packages for The Wash SMP2 area, the shoreline has been broken down into Policy Development Zones (PDZs). The PDZs are defined as being a length of coastline within which the issues and physical processes are interrelated to such an extent that the SMP will need to make integrated decisions for the whole of the zone. There are four PDZs within The Wash SMP2 as listed below:

- PDZ1 – Gibraltar Point to Wolferton Creek;
- PDZ2 – Wolferton Creek to South Hunstanton;
- PDZ3 – Hunstanton Town; and
- PDZ4 – Hunstanton Cliffs.

The boundary between PDZ1 and PDZ2 follows the outflow of Wolferton Creek in a south-east to north-west direction (figure 3.4c). This PDZ boundary reflects the change from the Fenland and intertidal saltmarsh and mudflats within PDZ1 to the shingle ridge / earth embankment defended narrow coastal strip in PDZ2. The water body boundary between the Wash Inner and Wash Outer water bodies also lies in the vicinity of this PDZ boundary but crosses Wolferton Creek in an east-west orientation (figure 3.4c). Although the SMP2 PDZ boundary is inconsistent with the water body boundary at this location it has been set on the basis of coastal processes and the nature of the landscape. Therefore it is not appropriate to adjust it.

The SMP2 boundaries between PDZ2 and PDZ3 and between PDZ3 and PDZ4 both fall within the Wash Outer water body. As such, there are no inconsistencies with water body boundaries.

Figure 3.4a: SMP2 and WFD water body boundaries at Gibraltar Point

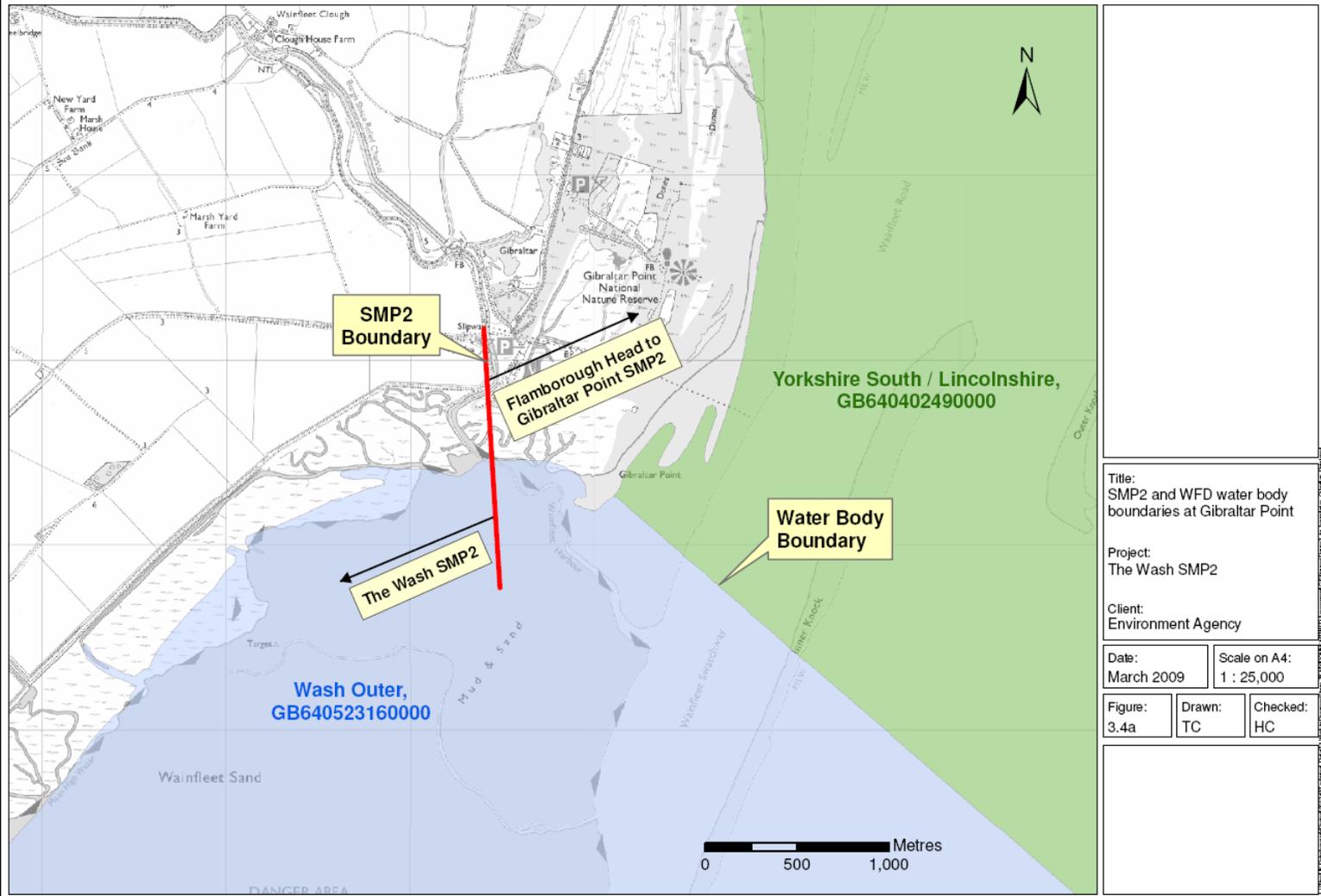


Figure 3.4b: SMP2 and WFD water body boundaries at Old Hunstanton Cliffs

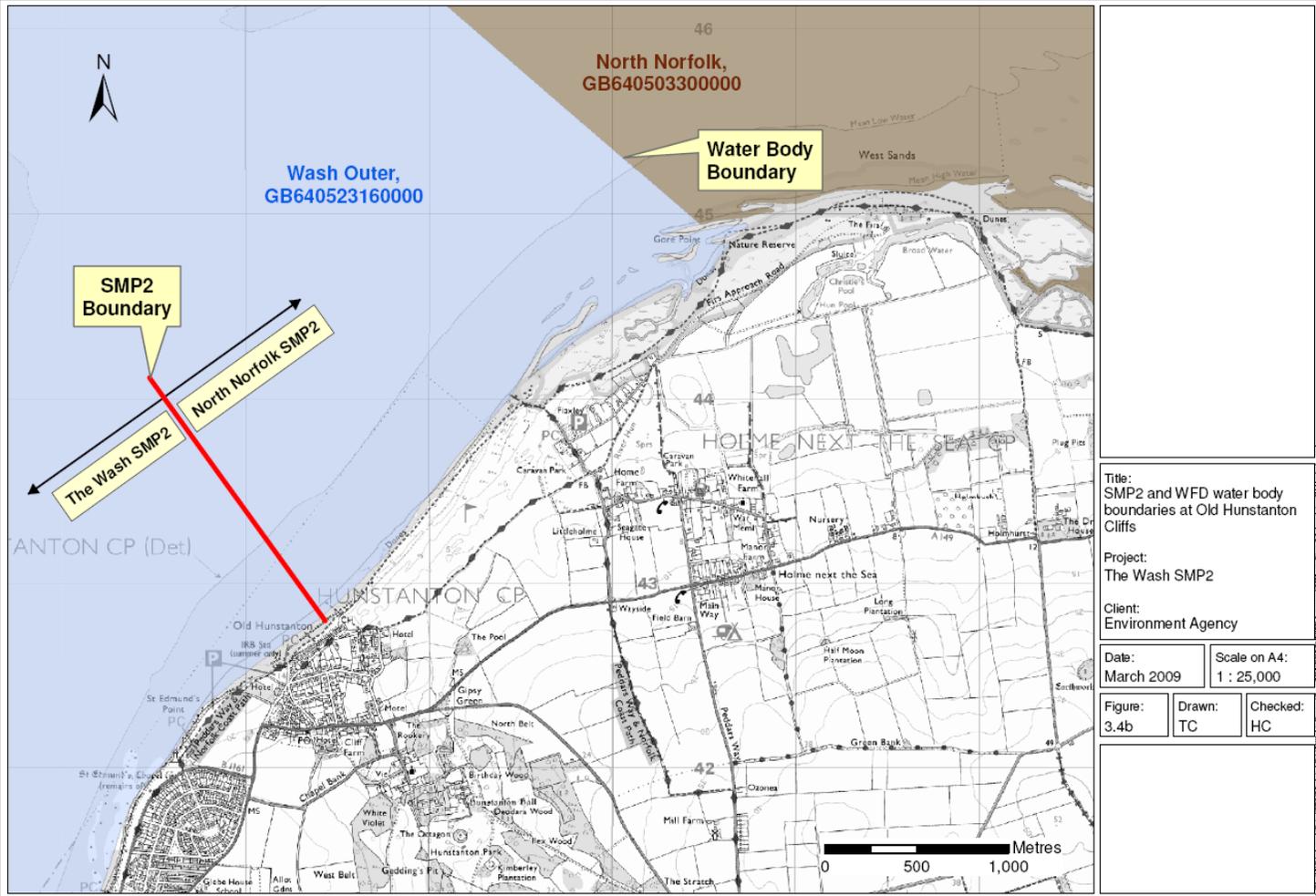
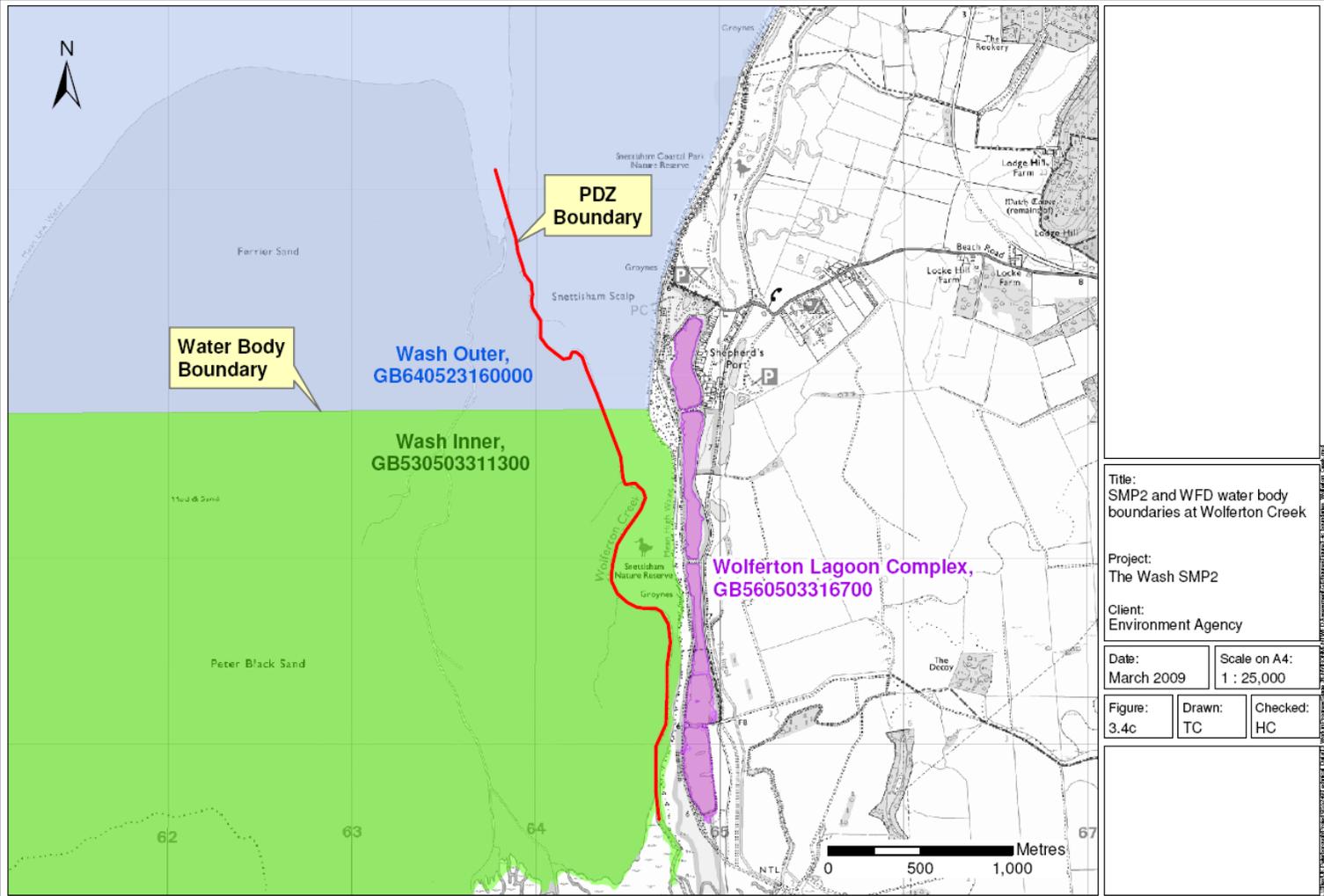


Figure 3.4c: SMP2 and WFD water body boundaries at Wolferton Creek



K3.1.5 Defining Features and Issues

For TraC water bodies in The Wash SMP2 area, the hydromorphological parameters that could potentially be affected by SMP2 policies and the BQEs that are dependent upon these are shown in Assessment Table 1. The key features and issues for each water body in the SMP2 area are then summarised in Assessment Table 2, together with the classification and Environmental Objectives for each TraC water body.

With the exception of the Wolferton Lagoon Complex water body, the features and issues are largely similar for all of the TraC water bodies within the Wash SMP2 area. The only difference is the added need to consider potential impacts on phytoplankton for the Steeping, Witham, Welland, Nene and Great Ouse water bodies. The main potential impacts on BQEs arise through potential changes in wave patterns, the tidal prism and/or coastal squeeze due to changes in control points or defences as a result of SMP2 policies. These could result in changes to flows and/or the sedimentary regime within The Wash system and, hence, affect erosion/accretion patterns.

The Wolferton Lagoon Complex is different as it comprises small, brackish lagoons protected to the seaward edge by a shingle ridge. Consequently, this water body has the potential to be affected by changes in salinity and turbidity through tidal inundation due to increased overtopping and/or breaching of the shingle ridge.

SMP policies have the potential to impact upon the chemical status of surface water bodies where a policy of NAI or landward realignment is implemented at a location where there is historic contamination (e.g. historic landfill) in close proximity to the coastline. No such sites with historic contamination have been identified within the Wash SMP2 area. Therefore it is considered unlikely that policies within The Wash SMP2 have the potential to impact upon the chemical status of water bodies. Chemical status is therefore not considered further within this assessment.

There are no High Status water bodies in The Wash SMP2 area and therefore Environmental Objective WFD1 is not applicable.

Assessment Table 1: BQEs within TraC water bodies that could be affected by changes to hydromorphology as a result of relevant SMP policies

✓ = Applies to water body ? = Might apply and hence included

Feature	Issues	Water Body							
		Wash Outer	Wash Inner	Steeping	Witham	Welland	Nene	Great Ouse	Wolferton Lagoon Complex
Phytoplankton	Residence time			✓	✓	✓	✓	✓	✓
	Water depth			✓	✓	✓	✓	✓	✓
	Thermal regime								✓
	Turbidity			✓	✓	✓	✓	✓	✓
Macroalgae	Episodicity (at the low end of velocity spectrum)								
	Salinity								✓
	Abrasion	✓	✓	✓	✓	✓	✓	✓	✓
Angiosperms	Inundations (tidal regime)	✓	✓	✓	✓	✓	✓	✓	✓
	Sediment loading	✓	✓	✓	✓	✓	✓	✓	✓
	Land elevation	✓	✓	✓	✓	✓	✓	✓	✓
	Salinity								✓
	Abrasion (associated with velocity)	✓	✓	✓	✓	✓	✓	✓	✓
Benthic/macro invertebrate	Beach water table	✓	✓	✓	✓	✓	✓	✓	
	Rainfall patterns								
	Light								✓
	Groundwater connectivity								
	Availability of leaf litter / organic debris								✓
	Connectivity with riparian zone								

Feature	Issues	Water Body							
Biological Quality Element (BQE)	Potential for change in physical or hydromorphological parameter	Wash Outer	Wash Inner	Steeping	Witham	Welland	Nene	Great Ouse	Wolferton Lagoon Complex
Fish	Heterogeneity of habitat (substrate, provision of shelter)	✓	✓	✓	✓	✓	✓	✓	✓
	Continuity of migration routes		✓	✓	✓	✓	✓	✓	✓
	Substrate conditions	✓	✓	✓	✓	✓	✓	✓	✓
	Presence of macrophytes								✓
	Accessibility to nursery areas (elevation of saltmarsh, connectivity with shoreline/riparian zone)	✓	✓	✓	✓	✓	✓	✓	✓

Assessment Table 2: Water Framework Directive Features and Issues for TraC water bodies in the Wash SMP2 (colour shading corresponds to the shaded water bodies in figure 3.1)

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
Wash Outer (PDZ1 - PDZ4)	Macroalgae	There is potential for impacts on macroalgae through changes in abrasion (associated with velocity) as SMP2 policies may result in changes in the tidal prism and associated erosion patterns. In addition, changes to control structures or defences, e.g. spit systems, earth embankments or groynes, may result in changes to wave patterns and hence erosion/accretion patterns.	<p>Classification: Moderate Ecological Status (not designated as AWB or HMWB)</p> <ul style="list-style-type: none"> • 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. • 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.
	Angiosperms	There are large areas of saltmarsh habitat within the Wash Outer water body and SMP2 policies have the potential to lead to changes in the vertical elevation of the intertidal area through changes in erosion/accretion patterns together with potential changes in the tidal prism which could also affect abrasion patterns. Potential for steepening of the saltmarsh/mudflat profile which could cause it to become unstable, particularly during storm events. In addition, changes to wave patterns and/or the tidal prism can affect sediment loading which also has the potential to impact angiosperms. SMP2 policies could also lead to changes in the frequency of tidal inundation of saltmarsh habitats within the water body through changes in land elevation and management of the effects of sea level rise. Potential for coastal squeeze in later epochs.	

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
	Benthic/macro invertebrates	SMP2 policies may impact benthic invertebrates through changes to the beach water table due to changes in beach levels and/or alignment of the shoreline.	
	Fish	Potential changes in sediment transport due to changes in wave patterns and/or the tidal prism affecting erosion patterns may lead to changes in substrate conditions and the heterogeneity of habitats available for fish. There is also potential for changes in mudflats and saltmarsh elevation as well as movements of the sandbanks offshore, which may result in changes to the accessibility of the area to fish.	
Wash Inner (PDZ1)	Macroalgae	There is the potential for changes to wave patterns and/or the tidal prism as a result of SMP2 policies which may result in changes to patterns of erosion / accretion in the water body. In turn, this could lead to changes to abrasion and hence impact upon the macroalgae present.	Classification: Moderate Ecological Potential (HMWB) <ul style="list-style-type: none"> 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. WFD3: No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies.
	Angiosperms	Changes to vertical and/or horizontal accretion rates and/or coastal squeeze as a result of SMP2 policies have the potential to impact upon the extensive saltmarsh habitats in the Wash Inner water body through changes to land elevation and frequency of tidal inundation. Potential for steepening of the saltmarsh/mudflat profile which could cause it to become unstable, particularly during storm events. There is also..	

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
		..potential for changes to wave patterns (and hence erosion) and the tidal prism which could lead to changes in sediment loading and potentially impact angiosperms.	<ul style="list-style-type: none"> WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration of groundwater status. Proposed Status Objective (from the RBMP for the Anglian RBD): Good Potential by 2027
	Benthic/macro invertebrates	There is potential for changes to the beach water table through changes in wave and erosion patterns along the coastline which could impact benthic/macro invertebrates.	
	Fish	Potential impacts on fish due to changes in substrate conditions, heterogeneity of habitat and/or accessibility to nursery areas/migration routes. Changes to control structures, natural controls and/or defences may lead to changes in wave patterns, resulting in changes in erosion and hence substrate conditions. There is also potential for changes in mudflats and sandflats which may result in changes to the accessibility of the area.	
Steeping (PDZ1)	Phytoplankton	There is potential for SMP2 policies to result in changes to the residence time, water depth and turbidity within the estuary through changes to defences. This potentially could impact upon phytoplankton populations within the estuary.	Classification: Moderate Ecological Potential (HMWB)
	Macroalgae	Potential changes to abrasion through changes to wave patterns and/or tidal prism as a result of SMP2 policies.	

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
	Angiosperms	Changes to erosion and sediment supplies within the transitional water body potentially could result from SMP2 policies, which could lead to changes in sediment loading, land elevation and abrasion patterns. Changes to land elevation together with potential alteration of wave patterns and/or the tidal prism could also result in changes to the frequency of tidal inundations and thus potentially impact on angiosperms.	<ul style="list-style-type: none"> • 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. • 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.
	Benthic/macro invertebrates	SMP2 policies potentially could result in changes to the beach water table with potential impacts on invertebrates. Changes to flow and sedimentary regimes could also impact on invertebrates.	
	Fish	Fish have the potential to be impacted by SMP2 policies through changes to substrate conditions, habitat heterogeneity, continuity for migration routes and accessibility to nursery areas. Changes to controls and/or defences may lead to changes in wave patterns, resulting in changes in erosion and hence substrate conditions. There is also potential for changes in mudflats and creek patterns, particularly in the mouth of the water body, which may result in changes to the accessibility of the area.	
Witham	Phytoplankton	There is potential for SMP2 policies to result in changes to the	Classification: Moderate Ecological

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
(PDZ1)		residence time of the estuary, water depth and turbidity which could impact upon phytoplankton.	Potential (HMWB) <ul style="list-style-type: none"> • 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. • 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. Proposed Status Objective (from the RBMP for the Anglian RBD): Good Potential by 2027
	Macroalgae	SMP2 policies potentially could result in changes to flow and wave patterns within the transitional water body, which could lead to changes in abrasion and, hence, potentially impact macroalgae.	
	Angiosperms	There are areas of saltmarsh within the water body that potentially could be impacted by SMP2 policies through changes to erosion and sediment supplies resulting in changes in sediment loading, land elevation and abrasion. Changes to defences, the alignment of the coastline and/or creek patterns within the saltmarsh have the potential to result in changes in the frequency of tidal inundations.	
	Benthic/macro invertebrates	Invertebrates in the estuary could be affected by changes in the beach water table as a result of SMP2 policies, particularly within the mudflats and saltmarsh. Changes to flows and abrasion could also impact benthic invertebrates.	
	Fish	Potential impacts on fish due to changes in substrate conditions, heterogeneity of habitats, continuity for migration routes and/or accessibility to nursery areas. SMP2 policies may result in changes in sediment transport due to changes in wave patterns and/or the tidal prism affecting erosion patterns which.. ..may lead to changes in substrate conditions and the	

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
		heterogeneity of habitats available for fish. There is also potential for changes in mudflats and saltmarsh elevation which may result in changes to the accessibility of the area to fish.	
Welland (PDZ1)	Phytoplankton	Changes to defences as a result of SMP2 policies has the potential to impact phytoplankton populations in the estuary through changes to the sedimentary regime, wave patterns and/or the tidal prism which could alter the residence time, water depth and/or the turbidity of the water body.	<p>Classification: Moderate Ecological Potential (HMWB)</p> <ul style="list-style-type: none"> • 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. • 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. <p>Proposed Status Objective (from the RBMP for the Anglian RBD): Good Potential by 2027</p>
	Macroalgae	There is the potential for changes to wave patterns and/or the tidal prism as a result of SMP2 policies which would result in changes to patterns of erosion / accretion in the water body. In turn, this could lead to changes to abrasion and hence impact upon the macroalgae present.	
	Angiosperms	Changes to erosion and sediment supplies within the transitional water body potentially could result from SMP2 policies, which could lead to changes in sediment loading, land elevation and abrasion patterns. Changes to land elevation together with potential alteration of wave patterns and/or the tidal prism could also result in changes to the frequency of tidal inundations and thus potentially impact on angiosperms. Potential for coastal squeeze in later epochs.	

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
	Benthic/macro invertebrates	Potential changes to beach water levels as well as changes to mudflats and saltmarsh creeks due to changes in flow and sedimentary regime.	
	Fish	Potential changes in sediment transport due to changes in wave patterns and/or the tidal prism affecting erosion patterns may lead to changes in substrate conditions and the heterogeneity of habitats available for fish. There is also potential for changes in mudflats and saltmarsh elevation which may result in changes to the accessibility of the area to fish.	
Nene (PDZ1)	Phytoplankton	Potential changes to water depth, residence time and turbidity in the estuary due to changes in defences / alignment of the coastline as a result of SMP2 policies.	Classification: Moderate Ecological Potential (HMWB) <ul style="list-style-type: none"> • 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. • WFD3: No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies.
	Macroalgae	There is potential for impacts on macroalgae through changes in abrasion (associated with velocity) as SMP2 policies may result in changes in the tidal prism and associated erosion patterns. In addition, changes to defences may result in changes to wave patterns and hence erosion/accretion patterns.	

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
	Angiosperms	Angiosperms in the water body have the potential to be impacted through changes to tidal inundations, sediment loading, land elevation and abrasion (associated with velocity). Particularly in the medium and long term, SMP2 policies have the potential to impact angiosperms due to increased pressure on saltmarsh areas through potential for increased wave action and/or tidal prism and coastal squeeze against the hard defence line.	<ul style="list-style-type: none"> WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration of groundwater status.
	Benthic/macro invertebrates	SMP2 policies may impact benthic invertebrates through changes to the beach water table, particularly within the mudflats and saltmarsh, as well as changes to the flow and sedimentary regime in the estuary.	
	Fish	SMP2 policies have the potential to result in changes to the heterogeneity of habitat, substrate conditions, continuity for migration routes and accessibility to nursery areas and, hence, could potentially impact upon fish.	
Great Ouse (PDZ1)	Phytoplankton	There is potential for SMP2 policies to result in changes to the residence time of the estuary, water depth and turbidity which could impact upon phytoplankton.	Classification: Moderate Ecological Potential (HMWB) <ul style="list-style-type: none"> 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..
	Macroalgae	Potential changes to abrasion through changes to wave patterns and/or tidal prism as a result of SMP2 policies.	

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
	Angiosperms	This water body includes a large area of saltmarsh habitat at the mouth of the estuary. SMP2 policies have the potential to result in changes to vertical and/or horizontal accretion rates, wave patterns and/or the tidal prism, which may lead to changes in the frequency of inundations, sediment loading, land elevation and/or abrasion and, hence, impact upon angiosperms. Potential for coastal squeeze in later epochs.	<p>..Status or Potential.</p> <ul style="list-style-type: none"> • 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. <p>Proposed Status Objective (from the RBMP for the Anglian RBD): Good Potential by 2027</p>
	Benthic/macro invertebrates	SMP2 policies potentially could result in changes to the beach water table with potential impacts on invertebrates. Changes to flow and sedimentary regimes in the estuary could also impact on invertebrates.	
	Fish	Potential changes in sediment transport due to changes in wave patterns and/or the tidal prism affecting erosion patterns may lead to changes in substrate conditions and the heterogeneity of habitats available for fish. There is also potential for changes in mudflats and saltmarsh elevation which may result in changes to the accessibility of the area to fish.	
Wolferton Lagoon Complex (PDZ2)	Phytoplankton	There is potential for SMP2 policies to result in changes to the water depth, residence time, thermal regime and turbidity within the lagoons. The lagoons are small water bodies situated seaward of the earth embankment defence line but protected from the intertidal area by a shingle ridge. The lagoons could potentially experience greater occurrences of overtopping of the	Classification: Moderate Ecological Status (not designated as AWB or HMWB)

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
		shingle... ..ridge from the sea and possibly even a breach, which could impact upon phytoplankton populations.	<ul style="list-style-type: none"> • 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. • 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.
	Macroalgae	The potential for increased overtopping and tidal inundation of the lagoon complex means there is potential for SMP2 policies to lead to changes in the salinity of the water body, whilst breaching of the shingle ridge could result in changes in abrasion (associated with velocity) which may impact upon macroalgae.	
	Angiosperms	There is potential for changes in the frequency of tidal inundations, salinity, sediment loading, land elevation and abrasion within the lagoon complex which may impact upon angiosperms. In particular, if SMP2 policies allow the shingle ridge to roll back and/or re-profile to a lower crest level, there is likely to be regular and significant overtopping of the ridge with the area of the lagoon complex potentially transforming into mudflat and saltmarsh.	
	Benthic/macro invertebrates	Invertebrates have the potential to be impacted by SMP2 policies through changes to light (associated to turbidity) and/or the availability of leaf litter/organic debris in the lagoon complex. Changes in salinity associated with increased overtopping of the shingle ridge may also impact upon the brackish invertebrate population.	

Feature		Issue	Water body classification and Environmental Objectives (Designation)
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
	Fish	Fish have the potential to be impacted by SMP2 policies through changes to substrate conditions, habitat heterogeneity, presence of macrophytes, continuity for migration routes and accessibility to nursery areas.	

K3.2 Assessment of the SMP2 Policy against the Environmental Objectives

Assessment Table 3 below expands on the assessment of the SMP2 policies, indicating whether there is potential for Environmental Objectives to be compromised at a PDZ scale. Further to the PDZ scale assessment, an assessment of the effect of potential failure at the water body scale is made in Assessment Table 4. Both Assessment Tables 3 and 4 identify potential for failure and consequently track the decisions that have been made within the SMP to meet conditions required to defend any later failure. The process enables key potential areas of concern to be flagged up and considered later at the strategy or scheme level.

Assessment Table 3: WFD Assessment of SMP policy for The Wash SMP2

Policy Development Zone (PDZ)		Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
		2025	2055	2105		WFD1	WFD2	WFD3	WFD4
PDZ1	Gibraltar Point to Wolferton Creek	HTL	HTL or MR	HTL or MR	<p>The intent of management for this PDZ is to sustain flood defence of the low-lying areas around the Wash, which will include an increase in management needed to maintain the existing level of flood risk with predicted sea level rises. In the short term (epoch 1) the policy is to hold the existing seabank alignments. During this epoch it is predicted that there will be continued sedimentation across both the saltmarsh and mudflats and the predicted rates of sedimentation are likely to exceed the predicted rate of sea level rise. Therefore, overall vertical growth of the intertidal habitat is expected. The saltmarsh / mudflat boundary is likely to continue to move seaward leading to an overall increase in saltmarsh area. As a result, the SMP2 policy for epoch 1 is not considered likely to result in deterioration of the Ecological Potential of the TraC water bodies. In addition, the policy to HTL does not have the potential to impact landward freshwater BQEs.</p> <p>There is significant uncertainty about the medium- and long-term rate of sea level rise, the response of the intertidal area and the role of the flood defences. Hence, the SMP2 policy for the medium and long term</p>	N/A	✓	x	✓

Policy Development Zone (PDZ)	Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
	2025	2055	2105		WFD1	WFD2	WFD3	WFD4
				<p>is conditional upon the results of further monitoring / research into the coastal processes of the Wash system and how it is functioning and responding to climate change, in particular with respect to erosion/accretion patterns. If the results of this monitoring and research indicate that the current accretional trend reverses and climate change is causing a loss of saltmarsh and mudflat habitat in front of the seabanks, then the policy will be to carry out targeted localised landward realignments. Implementation of MR would minimise impacts on the angiosperm and benthic/macro invertebrate BQEs in this PDZ by reducing the likelihood of coastal squeeze. Changes to wave patterns and/or the tidal prism could still result in impacts on macroalgae, phytoplankton (in the estuaries), angiosperms, invertebrates and/or fish but it is considered that the changes due to MR would be largely beneficial and, hence, deterioration of the TraC water bodies is unlikely. However, a policy of MR potentially could result in deterioration of landward freshwater bodies (FWBs) (see table 3.1) through changes to salinity, inundations and the presence of macrophytes due to saltwater inundation, which would impact on the freshwater BQEs.</p>				

Policy Development Zone (PDZ)	Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
	2025	2055	2105		WFD1	WFD2	WFD3	WFD4
				<p>If monitoring shows no loss of intertidal is occurring then the policy will be to continue to hold the current alignment in the later epochs. In this scenario the policy will not have the potential to impact freshwater BQEs as the current level of flood defence will be maintained and deterioration of the Ecological Potential of landward FWBs would be unlikely. Furthermore, if no loss of the intertidal is occurring, there should be no loss of saltmarsh / mudflat habitat, reducing the potential for impact on angiosperms and/or invertebrates. Therefore, deterioration in the Ecological Potential of the TraC water bodies would also be considered unlikely.</p> <p>As the policy for epoch 1 is HTL, it is considered that there will be no deterioration to groundwater status. This is on the basis that there will be no change to the current saltwater – freshwater interface. In epochs 2 and 3, if the policy is determined to be landward realignment, any potential impact to groundwater will be limited to GWBs G4016 (Steeping Long Eau Little Eau Chalk Unit) and G4017 (Steeping Great Eau Long Eau / Witham Spilsby Sandstone) as the remainder of the</p>				

Policy Development Zone (PDZ)		Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
		2025	2055	2105		WFD1	WFD2	WFD3	WFD4
					PDZ has been designated as unproductive strata. However, the risk of deterioration in status to G4017 is considered to be low as there are currently no groundwater abstractions with Source Protection Zones (SPZs) in G4017. Although there are several abstractions with SPZs in G4016, the risk of deterioration in status to this GWB is again considered to be low. This is due to the fact that the abstractions are located a significant distance from the coast. The direction of groundwater flow in this GWB is seawards and, as such, the total catchments of the abstractions (identified as zone 3 of the SPZ) extend away from the coast rather than towards it.				
PDZ2	Wolferton Creek to South Hunstanton	HTL	HTL / MR / NAI	HTL / MR / NAI	In this PDZ there are presently two lines of defence – a seaward shingle ridge currently managed to maintain its position and crest height, which protects the bungalows and caravan parks as well as Wolferton Lagoon Complex, and a landward seabank protecting Heacham and south Hunstanton. The SMP process has identified	? ³	x	x	✓

³ The Wolferton Lagoon Complex water body has not yet been assessed for classification and, hence, it is not possible at this stage to determine whether Environmental Objective WFD1 is applicable or not.

Policy Development Zone (PDZ)	Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
	2025	2055	2105		WFD1	WFD2	WFD3	WFD4
				<p>that future management of this PDZ is very complex and sensitive due to several factors including:</p> <ul style="list-style-type: none"> • significant risk to life through large numbers of people staying directly behind a 1:50 standard of defence; • increasing costs and environmental impacts of maintaining the shingle ridge in the future under increased pressure from climate change; and • the importance of the holiday homes and caravan parks to the local and regional economy. <p>The intent of management is to establish a co-operation between the partner organisations and all people and businesses with an interest in the area, to jointly develop a sustainable long-term solution. In the short term (epoch 1), both the existing defences will be held at their current alignments to allow time for adaptation of land use on the shingle ridge and between the two lines in preparation for future management changes in the medium and long-term. The policy of HTL is not considered likely to result in deterioration of the Ecological Potential of the TraC water bodies (Wash Inner and Wash Outer) as this represents a continuation of existing management and no loss of</p>				

Policy Development Zone (PDZ)	Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
	2025	2055	2105		WFD1	WFD2	WFD3	WFD4
				<p>mudflat/intertidal foreshore is predicted in this epoch. There are only likely to be small changes in shoreline exposure due to small predicted changes in sea level rise and the sediment output from this PDZ is expected to be balanced by natural sediment input during this timeframe. In addition, the policy to HTL does not have the potential to impact landward freshwater bodies or the saline lagoons behind the ridge as the current level of protection will be maintained.</p> <p>The policies in the medium and long term (epochs 2 and 3) are conditional and will be determined through a collaborative process to develop a long-term sustainable management approach. It is possible that parts of the current alignment can be held but it is likely that landward realignment or even No active intervention will be required for part of the frontage. If a policy of HTL is implemented over parts of the PDZ, there may be potential for deterioration of the TraC water bodies as a result of coastal squeeze impacting upon invertebrate and angiosperm BQEs. Sea level rise is predicted to outpace sediment accretion across the sandbanks in the Wash system, which may lead to increased exposure intertidal areas in this PDZ.</p>				

Policy Development Zone (PDZ)	Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
	2025	2055	2105		WFD1	WFD2	WFD3	WFD4
				<p>However, HTL would reduce the likelihood of potential deterioration of the saline lagoons behind the shingle ridge and of the lower reaches of landward freshwater bodies by protecting them from tidal inundation.</p> <p>Where a policy of landward realignment or NAI is implemented this would allow the shingle ridge to roll back and mitigate the impacts of sea level rise on intertidal/foreshore habitats and, therefore, invertebrate and angiosperm BQEs. As such, a policy of MR or NAI would be likely to have beneficial impacts on the Wash Outer and Wash Inner TraC water bodies. However, the presence of the earth embankment defence prevents the possibility of making space for the saline lagoons if the policy was to allow the roll back of the shingle ridge. In the medium term, it is likely that there would be continued build up of the spit at Snettisham Scalp which may provide some protection to the section of the shingle ridge which protects the lagoons. However, this is an uncertainty dependent on the continued availability of sediment and the future frequency of storm events. In the longer term, there would be regular and significant overtopping of the shingle ridge which would result in the saline lagoons</p>				

Policy Development Zone (PDZ)		Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
		2025	2055	2105		WFD1	WFD2	WFD3	WFD4
					<p>gradually being converted into intertidal mudflat and then saltmarsh. Therefore, MR and/or NAI policies have the potential to result in deterioration of the saline lagoons through changes to inundations and salinity impacting on the brackish BQEs.</p> <p>In addition, MR and NAI also have the potential to impact the lower reaches of the landward FWBs of the Rivers Ingol, Ingel and Heacham through changes to salinity, inundations and the presence of macrophytes due to saltwater inundation, which would impact on the freshwater BQEs.</p> <p>PDZ2 comprises part of GWB G4002 (North West Norfolk Chalk) which has been assessed during RBC2 as being 'Probably Not At Risk' and as 'Good' status and high confidence under the WFD assessment. On this basis there is no current evidence of saline intrusion to the GWB. Furthermore, there are no groundwater abstractions in this GWB with SPZs; therefore, the risk of SMP2 policies resulting in deterioration of the aquifer is low.</p>				
PDZ3	Hunstanton Town	HTL	HTL	HTL	The intent of the SMP2 policy is to sustain the viability of Hunstanton Town as a tourist resort and regional commercial centre by holding the shoreline defences in	N/A	x	✓	✓

Policy Development Zone (PDZ)	Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
	2025	2055	2105		WFD1	WFD2	WFD3	WFD4
				<p>their current alignment. This represents no change to the current management of this section of coastline. In the short and medium term there will be continued vertical erosion of the beach but this will be balanced by an increased supply of material from increased erosion of the cliffs in PDZ4. The groynes and sea wall will continue to provide significant protection against erosion, however there will be requirements for increased maintenance to retain the current standard of protection, particularly to the toe of the seawall. Therefore, in epochs 1 and 2, the sandy foreshore in front of Hunstanton Town will be maintained. In addition, there will be no significant change to current defences and, hence, wave or erosion/accretion patterns. Therefore deterioration in Ecological Potential of the TraC (Wash Outer) water body as a result of the SMP2 policy is considered unlikely.</p> <p>However, in the long-term (epoch 3) there will be increased vertical erosion rates due to a change in exposure to wave attack coupled with sea level rise. This will result in the loss of the sediment foreshore in front of Hunstanton town, which potentially could impact upon benthic/macro invertebrates, macroalgae and/or</p>				

Policy Development Zone (PDZ)		Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
		2025	2055	2105		WFD1	WFD2	WFD3	WFD4
					<p>angiosperms and, hence, potentially contribute to deterioration of the Ecological Potential of the Wash Outer water body. This would lead to the requirement for a specific nourishment programme in front of Hunstanton Town to ensure the settlement remains as an important tourist destination.</p> <p>There are no landward FWBs at risk in PDZ3 and the SMP2 policy of HTL does not have the potential to result in deterioration in Status or Potential of adjacent freshwater bodies.</p> <p>GWBs within this PDZ have been assessed as 'Probably not at Risk' and therefore deterioration to groundwater status is considered unlikely.</p>				
PDZ4	Hunstanton Cliffs	NAI	NAI	NAI / HTL	<p>In the short and medium term the SMP2 policy supports the natural development of the coastline, allowing the cliffs to erode naturally and provide sediment to maintain the beaches to the south in PDZ3. This is expected to result in narrowing of the intertidal zone and lowering of the beach platform, leading to beach steepening. However, this loss of intertidal will be due to natural processes, and as such it is not considered</p>	N/A	x	✓	✓

Policy Development Zone (PDZ)	Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
	2025	2055	2105		WFD1	WFD2	WFD3	WFD4
				<p>as deterioration in the Ecological Potential of the TraC water body due to the SMP2 policy.</p> <p>In the long-term (epoch 3), the intent of the management is to prevent further erosion of the cliffs to the south of the lighthouse once erosion starts to threaten cliff top properties and the B1161. To the north of the lighthouse, the coastline will continue to remain unmanaged. With sea level rise there will be some loss of foreshore sediment in this PDZ as hard defences will prevent erosion of the cliffs and result in coastal squeeze. This could impact upon benthic/macro invertebrates. The hard defences are also likely to have knock-on effects for PDZ3 by reducing the supply of sediment to the beach ridge to the south, which potentially could impact upon benthic/macro invertebrates and/or angiosperms in this area. Therefore, the SMP2 policy has the potential to result in deterioration in the Ecological Potential of the Wash Outer water body in epoch 3. As such, a better understanding of the technical, economic and environmental viability are required to confirm the intent to protect the cliff top properties and road.</p>				

Policy Development Zone (PDZ)	Policy Plan			WFD Assessment of Deterioration	Environmental Objectives met?			
	2025	2055	2105		WFD1	WFD2	WFD3	WFD4
				<p>There are no landward FWBs in PDZ4 and, therefore, the SMP2 policy of NAI does not have the potential to result in deterioration in Status or Potential of adjacent freshwater bodies.</p> <p>With respect to GWBs, the policy of NAI potentially could result in the saltwater – freshwater interface moving landwards. However, there are no groundwater abstractions with Source Protection Zones (SPZs) in this area. Furthermore, the likely area of impact is considered to be small compared to the entire GWB, therefore any potential deterioration to groundwater as a result of the policy of NAI is considered to be unlikely.</p>				
Key: HTL - Hold the line, A - Advance the line, NAI – No active intervention, MR – Managed realignment, HR – Hold the Line on a retreated alignment.								

K3.2.1 Environmental Objective WFD1

There are no High Status water bodies in The Wash SMP2 area and therefore Environmental Objective WFD1 is not applicable. Therefore, the potential of SMP2 policies to meet or fail WFD1 has not been considered further in this assessment.

K3.2.2 Environmental Objective WFD2

Three out of the four PDZs in the Wash SMP2 were identified as having the potential to contribute to a failure to meet Environmental Objective 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). In PDZ3 and PDZ4, the long-term (epoch 3) policy of HTL could result in a loss of sediment foreshore as hard defences prevent erosion of Hunstanton Cliffs and the beach in front of Hunstanton town, which potentially could impact upon macro / benthic invertebrates, macroalgae and angiosperms in the Wash Outer water body. In PDZ2, the SMP2 policies are conditional for epochs 2 and 3 but if a long-term policy of HTL is implemented there may be potential for deterioration of the Wash Inner and Wash Outer water bodies due to coastal squeeze as a result of sea level rise impacting invertebrate and angiosperm BQEs. However, if a long-term policy of landward realignment or NAI is implemented there is potential for the loss of the saline lagoons behind the shingle ridge with associated impacts on the brackish biology of this lagoon habitat and significant deterioration of the Wolferton Lagoon Complex water body.

In PDZ1, which covers by far the largest extent of the Wash SMP2 area, it is considered that the SMP2 policies do not have the potential to result in deterioration of the TraC surface water bodies and that Environmental Objective WFD2 can still be met. The conditional nature of the policy for the medium- and long-term means that a policy will be implemented which reflects the response of the coastline to climate change, as determined from further monitoring and research. Policy setting in the future will take account of sea level rise and changes to erosion/accretion patterns, which have the potential to cause a loss of saltmarsh and mudflat area, to ensure that the integrity of these habitats is maintained and minimise impacts upon the macroalgae, phytoplankton, angiosperm, invertebrate and fish BQEs of the TraC water bodies within the Wash SMP2.

K3.2.3 Environmental Objective WFD3

The SMP2 policies for PDZ1 and PDZ2 have the potential to fail to meet Environmental Objective WFD3 (no changes which permanently prevent or compromise the Environmental Objectives being met in other water bodies). Both PDZs have conditional policies for later epochs and if a policy of landward realignment or NAI is implemented it may result in changes to salinity and tidal inundations of landward freshwater bodies and, hence,

impact upon the freshwater biology of these water bodies. However, Gibraltar Point is a soft headland that acts to constrain the mouth of the Wash as a whole and, hence, it is considered unlikely that SMP2 policies for PDZ1 will result in deterioration of the Ecological Potential of the adjacent Yorkshire South / Lincolnshire TraC water body to the north.

There are no landward freshwater bodies at risk behind the frontages of PDZ3 and PDZ4 and hence the SMP2 policies for these PDZs do not have the potential to result in deterioration of adjacent freshwater bodies. Sediment generated as a result of the erosion of Hunstanton Cliffs is transported to the south, towards PDZ3 and Snettisham Scalp in PDZ2 and, therefore, it is considered unlikely that management policies for PDZ4 have the potential to impact BQEs and result in deterioration of the adjacent North Norfolk TraC water body to the north-east.

K3.2.4 Environmental Objective WFD4

SMP2 policies for all four PDZs meet Environmental Objective WFD4 (no changes that will cause failure to meet good groundwater status or result in a deterioration of groundwater status). A large extent of the Wash SMP2 has been defined as unproductive strata (figure 3.3a) and so SMP policies in these areas do not have the potential to affect groundwater status. In the remainder of the SMP2 area, groundwater bodies have been classified as at Good Status and there is no current evidence of saline intrusion to groundwater bodies. Any abstractions within these groundwater bodies are located a significant distance from the coast which, together with the seaward direction of groundwater flow, means that the risk of deterioration in status due to SMP policy is considered to be low.

K3.2.5 Water Framework Directive Summary Statements

A water body by water body summary of achievement (or otherwise) of the Environmental Objectives for the SMP2 policies is shown in Assessment Table 4. This table indicates that completion of a Water Framework Directive Summary Statement was necessary for all water bodies in the SMP2 area. These Water Framework Directive Summary Statements can be found in Tables 5a – 5h.

Assessment Table 4: Summary of achievement of WFD Environmental Objectives for each TraC water body within The Wash SMP2 (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	Environmental Objectives met?				WFD Summary Statement required?
	WFD1	WFD2	WFD3	WFD4	
Wash Outer	N/A	X (PDZ2, PDZ3 & PDZ4)	X (PDZ1 & PDZ2)	✓	Yes – Environmental Objectives WFD2 and WFD3 may not be met in some PDZs in this water body under SMP2 policies.
Wash Inner	N/A	X (PDZ2)	X (PDZ1 & PDZ2)	✓	Yes – Environmental Objectives WFD2 and WFD3 may not be met in some PDZs in this water body under SMP2 policies.
Steeping	N/A	✓	X (PDZ1)	✓	Yes – Environmental Objective WFD3 may not be met in PDZ1 under SMP2 policies.
Witham	N/A	✓	X (PDZ1)	✓	Yes – Environmental Objective WFD3 may not be met in PDZ1 under SMP2 policies.
Welland	N/A	✓	X (PDZ1)	✓	Yes – Environmental Objective WFD3 may not be met in PDZ1 under SMP2 policies.
Nene	N/A	✓	X (PDZ1)	✓	Yes – Environmental Objective WFD3 may not be met in PDZ1 under SMP2 policies.
Great Ouse	N/A	✓	X (PDZ1)	✓	Yes – Environmental Objective WFD3 may not be met in PDZ1 under

Water body	Environmental Objectives met?				WFD Summary Statement required?
	WFD1	WFD2	WFD3	WFD4	
					SMP2 policies.
Wolferton Lagoon Complex	? ⁴	X (PDZ2)	X (PDZ2)	✓	Yes – Environmental Objectives WFD2 and WFD3 may not be met in PDZ2 under SMP2 policies.

⁴ Water body has not yet been classified so there is uncertainty as to whether WFD1 is applicable.

Table 5a: WFD Summary Statement for the Wash Outer water body (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
Wash Outer	<p>Mitigation measures: 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>Mitigation measures incorporated into SMP policies:</p> <ul style="list-style-type: none"> • More knowledge is needed to confirm the likelihood of the possible loss of mudflat and saltmarsh habitat in PDZ1. Therefore, the Action Plan in the final SMP document will include a specific programme of actions for monitoring, consultation and studies to improve predictions of intertidal developments and understanding of the impact of loss of foreshore on flood defence and habitats. The increased knowledge will inform the timing, location and extent of possible realignments to optimise defence sustainability and to compensate for the expected deterioration of intertidal habitats. • The Action Plan in the final SMP document will outline steps for developing the medium- and long-term policies for PDZ2 through a partnership approach with all relevant people, businesses and organisations involved. • Continued monitoring of coastal processes at Hunstanton Town (PDZ3) and Hunstanton Cliffs (PDZ4) is required to determine the need, or otherwise, for a nourishment programme in front of the town, to gain a better understanding of cliff erosion rates and to ensure Hunstanton does not develop into an unsustainable promontory. • The proposed action in the Anglian RBMP for “Managed realignment of coast similar to Freiston, Lincolnshire pilot” has been considered and incorporated into SMP2 policies. As

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>outlined in the RBMP Programme of Measures, cost benefit analysis has been investigated (including food security through loss of agricultural land) – see reasons of overriding public interest outlined below.</p> <p>Specific mitigation measures for implementation of individual schemes resulting from SMP2 policies will need to be considered when those schemes go through the planning process, and any environmental issues (including assessment under WFD) regarding the detail of scheme implementation will be dealt with at this time. This should include consideration of any suitable measures in the RBMP that are relevant to individual schemes (e.g. improvements to fish passage, increasing in-channel morphological diversity, use of soft engineering solutions etc). The Action Plan in the final SMP document should include a requirement for all schemes resulting from SMP2 policies to consider those mitigation measures listed in the Anglian RBMP Programme of Measures.</p>
	<p>Overriding public interest: 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 policy for PDZ1 to hold the existing earth embankment alignments is required to protect the large area of high grade agricultural land within the SMP area. This high quality agricultural land is of regional and national importance for quality of life and health with regard to food supply (refer to the SEA for further information on land use and agricultural quality). The policy to HTL is also necessary to protect the existing settlements and transport links (coastal A roads). Under an erosional future scenario for PDZ1, a policy of MR may be necessary as maintaining the current flood defences would become unsustainable with predicted sea level rise.</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>The short-term policy to HTL for PDZ2 is necessary to protect the semi-permanent dwellings (caravan parks and holiday homes) between the shingle ridge and the earth embankment to ensure the safety of residents and to allow the continuation of the current tourism based land use in this area. However, in the longer-term, a policy of MR or NAI may be necessary as continued maintenance of the shingle ridge is likely to become economically unsustainable as costs and environmental impacts are likely to increase with predicted sea level rises.</p> <p>The policy to HTL for all epochs at PDZ3 is necessary to protect the town of Hunstanton and ensure its continued role as a regional commercial centre and tourist destination. In the long-term, defence of Hunstanton Cliffs (PDZ4) may be necessary to protect cliff top properties and the B1161.</p> <p>For all PDZs, further detail on the economic viability (cost/benefit analysis) and sustainability of the preferred SMP policies can be found in appendix H (Economics).</p>
	<p>Better environmental options: 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>There are no significantly better options available – as part of the SMP process various policy packages were developed for each PDZ and were fully appraised against the SMP Objectives (which included objectives for mudflat, saltmarsh, sand dune and saline lagoon habitats). Further detail on the Policy Development and Appraisal can be found in appendix E and the Preferred Policy Appraisal can be found in appendix G.</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>Advancing the Line (AtL) is unrealistic for all PDZs as there are large disadvantages (e.g. loss of intertidal habitats, technically difficult, requirement for increasing flood defence management) and there is no significant driver.</p> <p>For PDZ1, NAI is not a viable option as it would result in the loss of defences and the whole area up to around Lincoln, Peterborough and Cambridge would be directly under threat from sea flooding.</p> <p>At Hunstanton Town (PDZ3) NAI and MR are not feasible options. NAI would lead to uncontrolled increase in flood and erosion risk in the town centre and boulevard and access to the foreshore would become hazardous and unsafe. Hence, there would be an unacceptable effect on the viability of Hunstanton as a seaside resort and town. MR would require the relocation of dwellings and the main road through Hunstanton and there would be significant costs associated with the construction of a new line of defence in later epochs.</p> <p>At Hunstanton Cliffs (PDZ4), the preferred policy of NAI represents the least costly and best environmental option for the short and medium term. However, it may not be possible to continue to allow natural development of the coastline in epoch 3 as increasing erosion rates may lead to the loss of a number of tourist assets, the B1161 and residential properties.</p>
	<p>Effect on other water bodies: Can it be demonstrated that the preferred SMP policies do</p>	<p>The assessment of deterioration found that impacts on adjacent TraC water bodies outside of the SMP2 area (i.e. the Yorkshire</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
	<p>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>South / Lincolnshire and the North Norfolk water bodies) are unlikely (see section K3.3.3). The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. It is considered unlikely that any groundwater bodies will be impacted as a result of the SMP2 policies as there is no current evidence of saline intrusion and abstractions are located a significant distance from the coast (see Assessment Table 3 and section K3.3.4). In PDZs 1 and 2 there is the potential for impacts on landward freshwater bodies if a policy of NAI or MR is implemented. However, the mitigation measures documented above should help to minimise any impacts on these water bodies.</p>
	<p>Other issues: 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>This water body includes a large part of the Wash SPA and Ramsar site, the Wash and North Norfolk Coast SAC and the Wash SSSI as well as several UK Biodiversity Action Plan (UKBAP) habitats. The policy appraisal undertaken as part of the SMP policy development process was carried out in parallel with the Habitats Regulations Assessment to ensure that the legal requirements of the Habitats Regulations have been taken into account and that any recommendations have been incorporated into the SMP policy.</p>

Table 5b WFD Summary Statement for the Wash Inner water body (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
Wash Inner	<p>Mitigation measures: 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>Mitigation measures incorporated into SMP policies:</p> <ul style="list-style-type: none"> • More knowledge is needed to confirm the likelihood of the possible loss of mudflat and saltmarsh habitat in PDZ1. Therefore, the Action Plan in the final SMP document will include a specific programme of actions for monitoring, consultation and studies to improve predictions of intertidal developments and understanding of the impact of loss of foreshore on flood defence and habitats. The increased knowledge will inform the timing, location and extent of possible realignments to optimise defence sustainability and to compensate for the expected deterioration of intertidal habitats. • The Action Plan in the final SMP document will outline steps for developing the medium- and long-term policies for PDZ2 through a partnership approach with all relevant people, businesses and organisations involved. • The proposed action in the Anglian RBMP for ‘Managed realignment of coast similar to Freiston, Lincolnshire pilot’ has been considered and incorporated into SMP2 policies. As outlined in the RBMP Programme of Measures, cost benefit analysis has been investigated (including food security through loss of agricultural land) – see reasons of overriding public interest outlined below. <p>Specific mitigation measures for implementation of individual schemes resulting from SMP2 policies will need to be considered</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>when those schemes go through the planning process, and any environmental issues (including assessment under WFD) regarding the detail of scheme implementation will be dealt with at this time. This should include consideration of any suitable measures in the RBMP that are relevant to individual schemes (e.g. improvements to fish passage, increasing in-channel morphological diversity, use of soft engineering solutions etc). The Action Plan in the final SMP document should include a requirement for all schemes resulting from SMP2 policies to consider those mitigation measures listed in the Anglian RBMP Programme of Measures.</p>
	<p>Overriding public interest: 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 policy to hold the existing earth embankment alignments is required along the part of the Wash Inner water body frontage within PDZ1 in order to protect the high grade agricultural land behind the defences, which is of regional and national importance for food supply (further information on land use and agricultural quality is included within the SEA). The policy to HTL is also necessary to protect the existing settlements and transport links (coastal A roads). Under an erosional future scenario for PDZ1, a policy of MR may be necessary as maintaining the current flood defences would become unsustainable with predicted sea level rise.</p> <p>The Wash Inner water body also spans the southern part of PDZ2. The short-term policy to HTL for PDZ2 is necessary to protect the semi-permanent dwellings (caravan parks and holiday homes) between the shingle ridge and the earth embankment to ensure the safety of residents and to allow the continuation of the</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>current tourism based land use in this area. However, in the longer-term, a policy of MR or NAI may be necessary as continued maintenance of the shingle ridge is likely to become economically unsustainable as costs and environmental impacts are likely to increase with predicted sea level rises.</p> <p>For both PDZ1 and PDZ2, further detail on the economic viability (cost/benefit analysis) and sustainability of the preferred SMP policies can be found in appendix H (Economics).</p>
	<p>Better environmental options: 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>There are no significantly better options available – as part of the SMP process various policy packages were developed for each PDZ and were fully appraised against the SMP Objectives (which included objectives for mudflat, saltmarsh, sand dune and saline lagoon habitats). Further detail on the Policy Development and Appraisal can be found in appendix E and the Preferred Policy Appraisal can be found in appendix G.</p> <p>Advancing the Line (AtL) is unrealistic for both PDZ1 and PDZ2 as there are large disadvantages (e.g. loss of intertidal habitats, technically difficult, requirement for increasing flood defence management) and potential drivers (e.g. future need for land) are considered insufficient.</p> <p>NAI is not a viable option for the part of the water body frontage in PDZ1 as it would result in the loss of defences and the whole area up to around Lincoln, Peterborough and Cambridge would be directly under threat from sea flooding.</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
	<p>Effect on other water bodies: 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>Adjacent TraC water bodies (Witham, Welland, Nene, Great Ouse, Wash Outer and Wolferton Lagoon Complex) are all within the Wash SMP2 area and hence covered within this assessment. The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. The majority of the Wash Inner water body is bounded by unproductive groundwater strata and, hence SMP2 policies in this area will not impact upon groundwater status. The risk of SMP2 policies resulting in deterioration of remaining groundwater strata in the area of the Wash Inner water body has been assessed as low (see Assessment Table 3 and section K3.3.4).</p> <p>A policy of MR in PDZ1 potentially could result in deterioration of landward freshwater bodies (see figure 3.2 and table 3.1) through changes in tidal inundation and salinity. The mitigation measures documented above with regards to the timing, location and extent of possible realignments should help to minimise any impacts on these water bodies.</p>
	<p>Other issues: 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>This water body includes a large part of the Wash SPA and Ramsar site, the Wash and North Norfolk Coast SAC and the Wash SSSI as well as several UK Biodiversity Action Plan (UKBAP) habitats. The policy appraisal undertaken as part of the SMP policy development process was carried out in parallel with the Habitats Regulations Assessment to ensure that the legal requirements of the Habitats Regulations have been taken into account and that any recommendations have been incorporated</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		into the SMP policy.

Table 5c WFD Summary Statement for the Steeping water body (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
Steeping	<p>Mitigation measures: 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>Mitigation measures incorporated into SMP policies:</p> <ul style="list-style-type: none"> • More knowledge is needed to confirm the likelihood of the possible loss of mudflat and saltmarsh habitat in PDZ1. Therefore, the Action Plan in the final SMP document will include a specific programme of actions for monitoring, consultation and studies to improve predictions of intertidal developments and understanding of the impact of loss of foreshore on flood defence and habitats. The increased knowledge will inform the timing, location and extent of possible realignments to optimise defence sustainability and to compensate for the expected deterioration of intertidal habitats. • The proposed action in the Anglian RBMP for ‘Managed realignment of coast similar to Freiston, Lincolnshire pilot’ has been considered and incorporated into SMP2 policies. As outlined in the RBMP Programme of Measures, cost benefit analysis has been investigated (including food security through loss of agricultural land) – see reasons of overriding public interest outlined below. <p>Specific mitigation measures for implementation of individual schemes resulting from SMP2 policies will need to be considered when those schemes go through the planning process, and any environmental issues (including assessment under WFD) regarding the detail of scheme implementation will be dealt with at this time. This should include consideration of any suitable</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>measures in the RBMP that are relevant to individual schemes (e.g. improvements to fish passage, increasing in-channel morphological diversity, use of soft engineering solutions etc). The Action Plan in the final SMP document should include a requirement for all schemes resulting from SMP2 policies to consider those mitigation measures listed in the Anglian RBMP Programme of Measures.</p>
	<p>Overriding public interest: 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 policy to hold the existing earth embankment alignments in PDZ1 is necessary to protect the high grade agricultural land important regionally and nationally for food supply, the coastal A roads and the existing settlements. Under an erosional future scenario for PDZ1, a policy of MR may be necessary as maintaining the current flood defences would become unsustainable with predicted sea level rise.</p> <p>Further detail on the economic viability (cost/benefit analysis) and sustainability of the preferred SMP policy for PDZ1 can be found in appendix H (Economics).</p>
	<p>Better environmental options: 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>As part of the SMP process various policy packages were developed for each PDZ and were fully appraised against the SMP Objectives (which included objectives for mudflat, saltmarsh, sand dune and saline lagoon habitats). Further detail on the Policy Development and Appraisal can be found in appendix E and the Preferred Policy Appraisal can be found in appendix G.</p> <p>There are no significantly better environmental options available -</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>Advancing the Line (AtL) is unrealistic as there are large disadvantages (e.g. loss of intertidal habitats, technically difficult, requirement for increasing flood defence management) and potential drivers (e.g. future need for land) are considered insufficient. NAI is not a viable option as it would result in the loss of defences and an uncontrolled increase in flood risk all the way to the high ground.</p>
	<p>Effect on other water bodies: 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 adjacent TraC water body (Wash Outer) lies within the Wash SMP2 area and hence has been covered within this assessment. In addition, the assessment of deterioration found that impacts on the nearby Yorkshire South / Lincolnshire water body are unlikely (section K3.3.3).</p> <p>The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. This water body lies with the Steeping Long Eau Little Eau Chalk Unit groundwater body (G4016) which has been classified as 'probably at risk'. However, although there are several abstractions with SPZs in G4016, the risk of deterioration in status to this GWB as a result of SMP2 policies is considered to be low as the abstractions are located a significant distance from the coast. In addition, the direction of groundwater flow in this GWB is seawards and, as such, the total catchments of the abstractions extend away from the coast rather than towards it.</p> <p>A long-term policy of MR potentially could result in deterioration</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		of landward freshwater bodies (see figure 3.2 and table 3.1) through changes in tidal inundation and salinity. However, the mitigation documented above with regards to the timing, location and extent of possible realignments should help to minimise any impacts on these water bodies.
	Other issues: 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)?	This water body includes part of the Wash SPA and Ramsar site, the Wash and North Norfolk Coast SAC and the Wash SSSI as well as UK Biodiversity Action Plan (UKBAP) habitats. The Steeping river also bounds the Gibraltar Point SPA and Ramsar site and the Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC. The policy appraisal undertaken as part of the SMP policy development process was carried out in parallel with the Habitats Regulations Assessment to ensure that the legal requirements of the Habitats Regulations have been taken into account and that any recommendations have been incorporated into the SMP policy.

Table 5d: WFD Summary Statement for the Witham water body (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
Witham	<p>Mitigation measures: 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>Mitigation measures incorporated into SMP policies:</p> <ul style="list-style-type: none"> • More knowledge is needed to confirm the likelihood of the possible loss of mudflat and saltmarsh habitat in PDZ1. Therefore, the Action Plan in the final SMP document will include a specific programme of actions for monitoring, consultation and studies to improve predictions of intertidal developments and understanding of the impact of loss of foreshore on flood defence and habitats. The increased knowledge will inform the timing, location and extent of possible realignments to optimise defence sustainability and to compensate for the expected deterioration of intertidal habitats. • The proposed action in the Anglian RBMP for “Managed realignment of coast similar to Freiston, Lincolnshire pilot” has been considered and incorporated into SMP2 policies. As outlined in the RBMP Programme of Measures, cost benefit analysis has been investigated (including food security through loss of agricultural land) – see reasons of overriding public interest outlined below. <p>Specific mitigation measures for implementation of individual schemes resulting from SMP2 policies will need to be considered when those schemes go through the planning process, and any environmental issues (including assessment under WFD) regarding the detail of scheme implementation will be dealt with at this time. This should include consideration of any suitable</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>measures in the RBMP that are relevant to individual schemes (e.g. improvements to fish passage, increasing in-channel morphological diversity, use of soft engineering solutions etc). The Action Plan in the final SMP document should include a requirement for all schemes resulting from SMP2 policies to consider those mitigation measures listed in the Anglian RBMP Programme of Measures.</p>
	<p>Overriding public interest: 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 policy for PDZ1 to hold the existing earth embankment alignments is required to protect the large area of high grade agricultural land within the SMP area. This high quality agricultural land is of regional and national importance for quality of life and health with regard to food supply (refer to the SEA for further information on land use and agricultural quality). The policy to HTL is also necessary to protect the existing settlements and transport links (coastal A roads). Under an erosional future scenario for PDZ1, a policy of MR may be necessary as maintaining the current flood defences would become unsustainable with predicted sea level rise.</p> <p>Further detail on the economic viability (cost/benefit analysis) and sustainability of the preferred SMP policy for PDZ1 can be found in appendix H (Economics).</p>
	<p>Better environmental options: 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</p>	<p>As part of the SMP process various policy packages were developed for each PDZ and were fully appraised against the SMP Objectives (which included objectives for mudflat, saltmarsh, sand dune and saline lagoon habitats). Further detail on the Policy Development and Appraisal can be found in appendix E and the Preferred Policy Appraisal can be found in appendix G.</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
	disproportionately costly?	<p>There are no significantly better environmental options available - Advancing the Line (AtL) is unrealistic as there are large disadvantages (e.g. loss of intertidal habitats, technically difficult, requirement for increasing flood defence management) and potential drivers (e.g. future need for land) are considered insufficient. NAI is not a viable option as it would result in the loss of defences and an uncontrolled increase in flood risk all the way to the high ground.</p>
	<p>Effect on other water bodies: 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>Adjacent TraC water bodies (Wash Inner, Wash Outer, Welland) are all within the Wash SMP2 area and hence covered within this assessment.</p> <p>The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. The Witham water body lies within unproductive groundwater strata and, hence, SMP2 policies in this area do not have the potential to impact upon groundwater status. If a policy of MR is implemented for PDZ1 in the medium- or long-term there is potential for landward freshwater bodies in this area to be impacted through changes in salinity due to saltwater inundation. The monitoring and mitigation outlined above will help to reduce this potential issue and inform any future realignments.</p>
	<p>Other issues: 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>This water body includes part of the Wash SPA and Ramsar site, the Wash and North Norfolk Coast SAC and the Wash SSSI as well as UK Biodiversity Action Plan (UKBAP) habitats. The policy appraisal undertaken as part of the SMP policy development</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>process was carried out in parallel with the Habitats Regulations to ensure that the legal requirements of the Habitats Regulations have been taken into account and that any recommendations have been incorporated into the SMP policy.</p>

Table 5e: WFD Summary Statement for the Welland water body (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
Welland	<p>Mitigation measures: 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>Mitigation measures incorporated into SMP policies:</p> <ul style="list-style-type: none"> • More knowledge is needed to confirm the likelihood of the possible loss of mudflat and saltmarsh habitat in PDZ1. Therefore, the Action Plan in the final SMP document will include a specific programme of actions for monitoring, consultation and studies to improve predictions of intertidal developments and understanding of the impact of loss of foreshore on flood defence and habitats. The increased knowledge will inform the timing, location and extent of possible realignments to optimise defence sustainability and to compensate for the expected deterioration of intertidal habitats. • The proposed action in the Anglian RBMP for ‘Managed realignment of coast similar to Freiston, Lincolnshire pilot’ has been considered and incorporated into SMP2 policies. As outlined in the RBMP Programme of Measures, cost benefit analysis has been investigated (including food security through loss of agricultural land) – see reasons of overriding public interest outlined below. <p>Specific mitigation measures for implementation of individual schemes resulting from SMP2 policies will need to be considered when those schemes go through the planning process, and any environmental issues (including assessment under WFD) regarding the detail of scheme implementation will be dealt with at this time. This should include consideration of any suitable</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>measures in the RBMP that are relevant to individual schemes (e.g. improvements to fish passage, increasing in-channel morphological diversity, use of soft engineering solutions etc). The Action Plan in the final SMP document should include a requirement for all schemes resulting from SMP2 policies to consider those mitigation measures listed in the Anglian RBMP Programme of Measures.</p>
	<p>Overriding public interest: 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 policy to HTL is necessary to protect high grade agricultural land in this area (which is of both regional and national importance for food supply) and to protect existing settlements and infrastructure (particularly coastal A roads). MR may be necessary in the medium- and long-term as maintenance of the existing defences is likely to become unsustainable with increasing sea level rise.</p> <p>Further detail on the economic viability (cost/benefit analysis) and sustainability of the preferred SMP policy for PDZ1 can be found in appendix H (Economics).</p>
	<p>Better environmental options: 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>As part of the SMP process various policy packages were developed for each PDZ and were fully appraised against the SMP Objectives (which included objectives for mudflat, saltmarsh, sand dune and saline lagoon habitats). Further detail on the Policy Development and Appraisal can be found in appendix E and the Preferred Policy Appraisal can be found in appendix G.</p> <p>There are no significantly better options available – AtL is not</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		feasible as there are large disadvantages (e.g. loss of intertidal habitats, technically difficult, requirement for increasing flood defence management) and potential drivers (e.g. future need for land) are considered insufficient to make this policy realistic. NAI is not a viable option as it would result in the loss of defences and an uncontrolled increase in flood risk all the way to the high ground.
	<p>Effect on other water bodies: 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>Adjacent TraC water bodies (Wash Inner, Wash Outer and Witham) are all within the Wash SMP2 area and are therefore covered within this assessment.</p> <p>The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. The Welland water body lies within unproductive groundwater strata and, hence, SMP2 policies in this area do not have the potential to result in deterioration of groundwater status. A medium- or long-term policy of MR potentially could result in deterioration of landward freshwater bodies (see figure 3.2 and table 3.1) through changes in tidal inundation and salinity. The mitigation measures outlined above with regards to the timing, location and extent of possible realignments should help to minimise any impacts on these water bodies.</p>
	<p>Other issues: Can it be shown that there are no other over-riding issues that should be considered (such as designated sites, recommendations of the</p>	<p>This water body includes part of the Wash SPA and Ramsar site, the Wash and North Norfolk Coast SAC and the Wash SSSI as well as UK Biodiversity Action Plan (UKBAP) habitats. The policy</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
	Appropriate Assessment)?	appraisal undertaken as part of the SMP policy development process was carried out in parallel with the Habitats Regulations Assessment to ensure that the legal requirements of the Habitats Regulations have been taken into account and that any recommendations have been incorporated into the SMP policy.

Table 5f: WFD Summary Statement for the Nene water body (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
Nene	<p>Mitigation measures: 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>Mitigation measures incorporated into SMP policies:</p> <ul style="list-style-type: none"> • More knowledge is needed to confirm the likelihood of the possible loss of mudflat and saltmarsh habitat in PDZ1. Therefore, the Action Plan in the final SMP document will include a specific programme of actions for monitoring, consultation and studies to improve predictions of intertidal developments and understanding of the impact of loss of foreshore on flood defence and habitats. The increased knowledge will inform the timing, location and extent of possible realignments to optimise defence sustainability and to compensate for the expected deterioration of intertidal habitats. • The proposed action in the Anglian RBMP for “Managed realignment of coast similar to Freiston, Lincolnshire pilot” has been considered and incorporated into SMP2 policies. As outlined in the RBMP Programme of Measures, cost benefit analysis has been investigated (including food security through loss of agricultural land) – see reasons of overriding public interest outlined below. <p>Specific mitigation measures for implementation of individual schemes resulting from SMP2 policies will need to be considered when those schemes go through the planning process, and any environmental issues (including assessment under WFD) regarding the detail of scheme implementation will be dealt with at this time. This should include consideration of any suitable measures in the RBMP that are relevant to individual schemes (e.g. improvements to fish passage, increasing in-channel morphological diversity, use of soft engineering solutions etc). The Action Plan in the final SMP document should</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		include a requirement for all schemes resulting from SMP2 policies to consider those mitigation measures listed in the Anglian RBMP Programme of Measures.
	<p>Overriding public interest: 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 policy to HTL is necessary to protect high grade agricultural land in this area (which is of both regional and national importance for food supply) and to protect existing settlements and infrastructure (particularly coastal A roads). Landward realignment may be necessary in the medium- and long-term as maintenance of the existing defences is likely to become unsustainable with increasing sea level rise.</p> <p>Further detail on the economic viability (cost/benefit analysis) and sustainability of the preferred SMP policy for PDZ1 can be found in appendix H (Economics).</p>
	<p>Better environmental options: 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>As part of the SMP process various policy packages were developed for each PDZ and were fully appraised against the SMP Objectives (which included objectives for mudflat, saltmarsh, sand dune and saline lagoon habitats). Further detail on the Policy Development and Appraisal can be found in appendix E and the Preferred Policy Appraisal can be found in appendix G.</p> <p>There are no significantly better options available – AtL is not feasible as there are large disadvantages (e.g. loss of intertidal habitats, technically difficult, requirement for increasing flood defence management) and potential drivers (e.g. future need for land) are considered insufficient to make this policy realistic. NAI is not a viable option as it would result in the loss of defences and an uncontrolled increase in flood risk all the way to the high ground.</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
	<p>Effect on other water bodies: 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>Adjacent TraC water bodies (Wash Inner, Wash Outer, Welland, Great Ouse) are all within the Wash SMP2 area and hence covered within this assessment.</p> <p>The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. The Nene water body lies within unproductive groundwater strata and, therefore, the SMP2 policies will not compromise the achievement of objectives for any groundwater bodies. The Luton Learn, South Holland Main Drain and North Level Main Drain freshwater bodies feed into the lower reaches of the Nene transitional water body (see figure 3.2 and table 3.1) and, hence, potentially could be impacted in the medium- and/or long-term if a policy of landward realignment is implemented. The mitigation measure documented above for monitoring, consultation and studies to inform the timing, location and extent of possible realignments should prevent SMP2 policies permanently excluding these freshwater bodies from achieving their Environmental Objectives.</p>
	<p>Other issues: 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>The mouth of this water body includes a small part of the Wash SPA and Ramsar site, the Wash and North Norfolk Coast SAC and the Wash SSSI as well as UK Biodiversity Action Plan (UKBAP) habitats. The policy appraisal undertaken as part of the SMP policy development process was carried out in parallel with the Habitats Regulations Assessment to ensure that the legal requirements of the Habitats Regulations have been taken into account and that any recommendations have been incorporated into the SMP policy. The Nene Washes SAC, SPA and Ramsar sites are also situated</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		adjacent to the Nene transitional water body. However, these designated sites are outside of the SMP2 area and the Flood Zone 2 extent and are therefore considered unlikely to be impacted by SMP2 policies.

Table 5g: WFD Summary Statement for the Great Ouse water body (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
Great Ouse	<p>Mitigation measures: 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>Mitigation measures incorporated into SMP policies:</p> <ul style="list-style-type: none"> • More knowledge is needed to confirm the likelihood of the possible loss of mudflat and saltmarsh habitat in PDZ1. Therefore, the Action Plan in the final SMP document will include a specific programme of actions for monitoring, consultation and studies to improve predictions of intertidal developments and understanding of the impact of loss of foreshore on flood defence and habitats. The increased knowledge will inform the timing, location and extent of possible realignments to optimise defence sustainability and to compensate for the expected deterioration of intertidal habitats. • The proposed action in the Anglian RBMP for “Managed realignment of coast similar to Freiston, Lincolnshire pilot” has been considered and incorporated into SMP2 policies. As outlined in the RBMP Programme of Measures, cost benefit analysis has been investigated (including food security through loss of agricultural land) – see reasons of overriding public interest outlined below. <p>Specific mitigation measures for implementation of individual schemes resulting from SMP2 policies will need to be considered when those schemes go through the planning process, and any environmental issues (including assessment under WFD) regarding the detail of scheme implementation will be dealt with at this time. This should include consideration of any suitable measures in the RBMP that are relevant to individual schemes (e.g. improvements to fish passage, increasing in-channel</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>morphological diversity, use of soft engineering solutions etc). The Action Plan in the final SMP document should include a requirement for all schemes resulting from SMP2 policies to consider those mitigation measures listed in the Anglian RBMP Programme of Measures.</p>
	<p>Overriding public interest: 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 policy to HTL is necessary to protect high grade agricultural land in this area (which is of both regional and national importance for food supply) and to protect existing settlements and infrastructure (particularly coastal A roads). Landward realignment may be necessary in the medium- and long-term as maintenance of the existing defences is likely to become unsustainable with increasing sea level rise.</p> <p>Further detail on the economic viability (cost/benefit analysis) and sustainability of the preferred SMP policy for PDZ1 can be found in appendix H (Economics).</p>
	<p>Better environmental options: 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>As part of the SMP process various policy packages were developed for each PDZ and were fully appraised against the SMP Objectives (which included objectives for mudflat, saltmarsh, sand dune and saline lagoon habitats). Further detail on the Policy Development and Appraisal can be found in appendix E and the Preferred Policy Appraisal can be found in appendix G.</p> <p>There are no significantly better environmental options available - Advancing the Line (AtL) is unrealistic as there are large disadvantages (e.g. loss of intertidal habitats, technically difficult, requirement for increasing flood defence management) and potential drivers (e.g. future need for land) are considered</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		insufficient. NAI is not a viable option as it would result in the loss of defences and an uncontrolled increase in flood risk to Kings Lynn and all the way to the high ground.
	<p>Effect on other water bodies: 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>Adjacent TraC water bodies (Wash Inner and Nene) are all within the Wash SMP2 area and hence covered within this assessment.</p> <p>The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. There are a number of freshwater tributaries to the lower reaches of the Great Ouse that potentially could be impacted by SMP2 policies, namely the Terrington, Babingley River and Gaywood River water bodies (see figure 3.2 and table 3.1). If a policy of landward realignment is implemented for PDZ1 in the medium- or long-term there is potential for these water bodies to be impacted through changes in salinity due to saltwater inundation. However, the monitoring and mitigation outlined above will help to reduce this potential issue and inform any future realignments.</p> <p>The Great Ouse water body lies within unproductive strata and, hence, SMP2 policies in this area do not have the potential to impact on the status of any groundwater bodies.</p>
	<p>Other issues: 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>The mouth of this water body includes a small part of the Wash SPA and Ramsar site, the Wash and North Norfolk Coast SAC and the Wash SSSI as well as UK Biodiversity Action Plan (UKBAP) habitats. The policy appraisal undertaken as part of the SMP</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>policy development process was carried out in parallel with the Habitats Regulations Assessment to ensure that the legal requirements of the Habitats Regulations have been taken into account and that any recommendations have been incorporated into the SMP policy.</p> <p>The Ouse Washes SAC, SPA and Ramsar sites and the Ouse Washes SSSI are also situated adjacent to the Great Ouse transitional water body. However, these designated sites are outside of the SMP2 area and the Flood Zone 2 extent and are therefore considered unlikely to be impacted by SMP2 policies.</p>

Table 5h: WFD Summary Statement for the Wolferton Lagoon Complex water body (colour shading corresponds to the shaded water bodies in figure 3.1)

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
<p>Wolferton Lagoon Complex</p>	<p>Mitigation measures: 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>Mitigation measures incorporated into SMP policies:</p> <ul style="list-style-type: none"> • The Action Plan in the final SMP document will outline steps for developing the medium- and long-term policies for PDZ2 through a partnership approach with all relevant people, businesses and organisations involved, to jointly develop a sustainable long term solution. • The proposed action in the Anglian RBMP for “Managed realignment of coast similar to Freiston, Lincolnshire pilot” has been considered and incorporated into SMP2 policies. As outlined in the RBMP Programme of Measures, cost benefit analysis has been investigated (including food security through loss of agricultural land) – see reasons of overriding public interest outlined below. <p>Specific mitigation measures for implementation of individual schemes resulting from SMP2 policies will need to be considered when those schemes go through the planning process, and any environmental issues (including assessment under WFD) regarding the detail of scheme implementation will be dealt with at this time. This should include consideration of any suitable measures in the RBMP that are relevant to individual schemes (e.g. improvements to fish passage, increasing in-channel morphological diversity, use of soft engineering solutions etc). The Action Plan in the final SMP document should include a requirement for all schemes resulting from SMP2 policies to consider those mitigation measures listed in the Anglian RBMP Programme of Measures.</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
	<p>Overriding public interest: 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 policy for PDZ2 to hold the existing defences at their current alignment in epoch 1 is necessary to protect the holiday homes and caravan parks between the shingle ridge and the landward seabank (to ensure the safety of residents and to allow the continuation of the current tourism based land use in this area), and to allow time for land use adaptation that may required for future epochs. In the medium- and/or longer-term, a policy of landward realignment or NAI may be necessary as continued maintenance of the shingle ridge is likely to become economically unsustainable as costs and environmental impacts are likely to increase with predicted sea level rises.</p> <p>Further detail on the economic viability (cost/benefit analysis) and sustainability of the preferred SMP policy for PDZ2 can be found in appendix H (Economics).</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
	<p>Better environmental options: 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>There are no significantly better options available – as part of the SMP process various policy packages were developed for each PDZ and were fully appraised against the SMP Objectives (which included objectives for mudflat, saltmarsh, sand dune and saline lagoon habitats). Further detail on the Policy Development and Appraisal can be found in appendix E and the Preferred Policy Appraisal can be found in appendix G.</p> <p>AtL is unrealistic for PDZ2 as there are large disadvantages (e.g. loss of intertidal habitats, technically difficult, requirement for increasing flood defence management) and there is no significant driver. The policies of HTL, landward realignment and NAI will all be considered for implementation in the medium- to long-term as part of the planned partnership approach to developing future management options.</p>
	<p>Effect on other water bodies: 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>Adjacent TraC water bodies (Wash Inner and Wash Outer) are both within the Wash SMP2 area and hence covered within this assessment.</p> <p>The Environment Agency Flood Map application and Groundwater maps have been consulted to check for landward freshwater and groundwater bodies that potentially could be impacted by SMP2 policies. The Wolferton Lagoon Complex lies within the North West Norfolk Sandringham Sands groundwater body (G4004), which has been assessed as at Good Status and 'probably not at risk'. Therefore, there is no current evidence of saline intrusion. In addition, there are no abstractions in this GWB so the risk of SMP2</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation with the SMP2
		<p>policies resulting in deterioration of the aquifer is low.</p> <p>There are two freshwater bodies that flow into Wolferton Creek – the Ingel and the Ingol rivers. If a policy of NAI or landward realignment is implemented in later epochs there is potential for the lower reaches of these FWBs to be impacted through changes to tidal inundations and salinity. The planned partnership approach to developing future management options for PDZ2 will need to consider potential impacts on freshwater ecology as part of the options appraisal process.</p>
	<p>Other issues: 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>The Wolferton Lagoon Complex is part of the Wash SPA and Ramsar site, the Wash and North Norfolk Coast SAC and the Wash SSSI as well as being a UK Biodiversity Action Plan (UKBAP) habitat. The policy appraisal undertaken as part of the SMP policy development process was carried out in parallel with the Habitats Regulations Assessment to ensure that the legal requirements of the Habitats Regulations have been taken into account and that any recommendations have been incorporated into the SMP policy.</p>

K4 DISCUSSION AND CONCLUSIONS

The WFD assessment of the SMP2 policies for each PDZ (Assessment Table 3) and the water body summary of achievement of WFD Environmental Objectives (Assessment Table 4) identified that there is potential that Environmental Objectives WFD2 and/or WFD3 may not be met in all eight TraC water bodies within the Wash SMP2 area. As a result, Water Framework Directive Summary Statements have been completed for all eight water bodies.

However, it must be noted that this assessment is based upon a precautionary approach where it has been determined that there is *potential* for SMP2 policies to result in deterioration of Ecological Status or Potential of a water body and hence *potential* for failure to meet WFD Environmental Objectives. Therefore, a precautionary check has been made against the conditions outlined in Article 4.7 of the Directive. The Summary Statements outline the reasons behind selecting the preferred SMP2 policy and any mitigation measures that have been incorporated into the policies and in the SMP Action Plan.

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