



Appendix L
Water Framework Directive Assessment
Suffolk SMP2

Suffolk Coastal District Council/Waveney District
Council/Environment Agency

November 2010

Final Report

4 Dean's Yard
Westminster
London SW1P 3NL
United Kingdom
+44 (0)20 7222 2115 Telephone
+44 (0)20 7222 2659 Fax
info@london.royalhaskoning.com E-mail
www.royalhaskoning.com Internet

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Drafted by Sean McNulty, Jon Allen
Checked by Hilary Crane, Rachel Brown and Marc Pieris
Date/initials check 27/10/09
Approved by Dr Helen Dangerfield
Date/initials approval 27/10/09 HRD
Approved Dr Matt Hunt
Date/initials approval 24/11/10 MH

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Abbreviations

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
cHMWB	Candidate Heavily Modified Water Body
HTL	Hold the Line
MA	Management Area
MR	Managed Realignment
NAI	No Active Intervention
PU	Policy Unit
RBD	River Basin District
PDZ	Policy Development Zone
RBMP	River Basin Management Plan
ROPI	Reasons of Overriding Public Interest
SMP2	Shoreline Management Plan
SPZ	Source Protection Zone
WFD	Water Framework Directive
TraC water bodies	Transitional and Coastal Water Bodies
WPM	With Present Management

1 INTRODUCTION

1.1 Purpose of Report

The Water Framework Directive (WFD; referred to in this report as the Directive) came into force in 2000 and is the most substantial piece of EC 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 *Water Framework Directive: Guidance for Assessment of SMPs under WFD*, which was recently developed for the Environment Agency (Royal Haskoning, 2009a). The guidance describes the methodology for assessing the potential hydromorphological change and consequent ecological impact of SMP2 policies and ensuring that SMP2 policy setting takes account of the Directive.

Although this report represents the first formal WFD assessment of SMP policies, the WFD has been a material consideration in developing policy alongside the Habitats Directive (92/43/EEC) and the SEA Directive (2001/42/EC). The aim of this assessment is to highlight potential issues that will form the basis of future assessments at the policy implementation stage.

1.2 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 ground waters 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, such as flood and coastal defence works. 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 RBMPs have undergone public consultation and the final plans were published on 22 December 2009.

The Suffolk SMP2 Area falls within the Broadland Rivers and East Suffolk catchments of the Anglian RBD.

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 phasing 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	4.1(b)(i)

1.2.1 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 Heavily Modified Water Bodies (HMWBs) or Artificial Water Bodies (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 necessary therefore to consider the possible changes associated to baseline policies 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.

1.2.2 Achieving objectives for EU protected sites

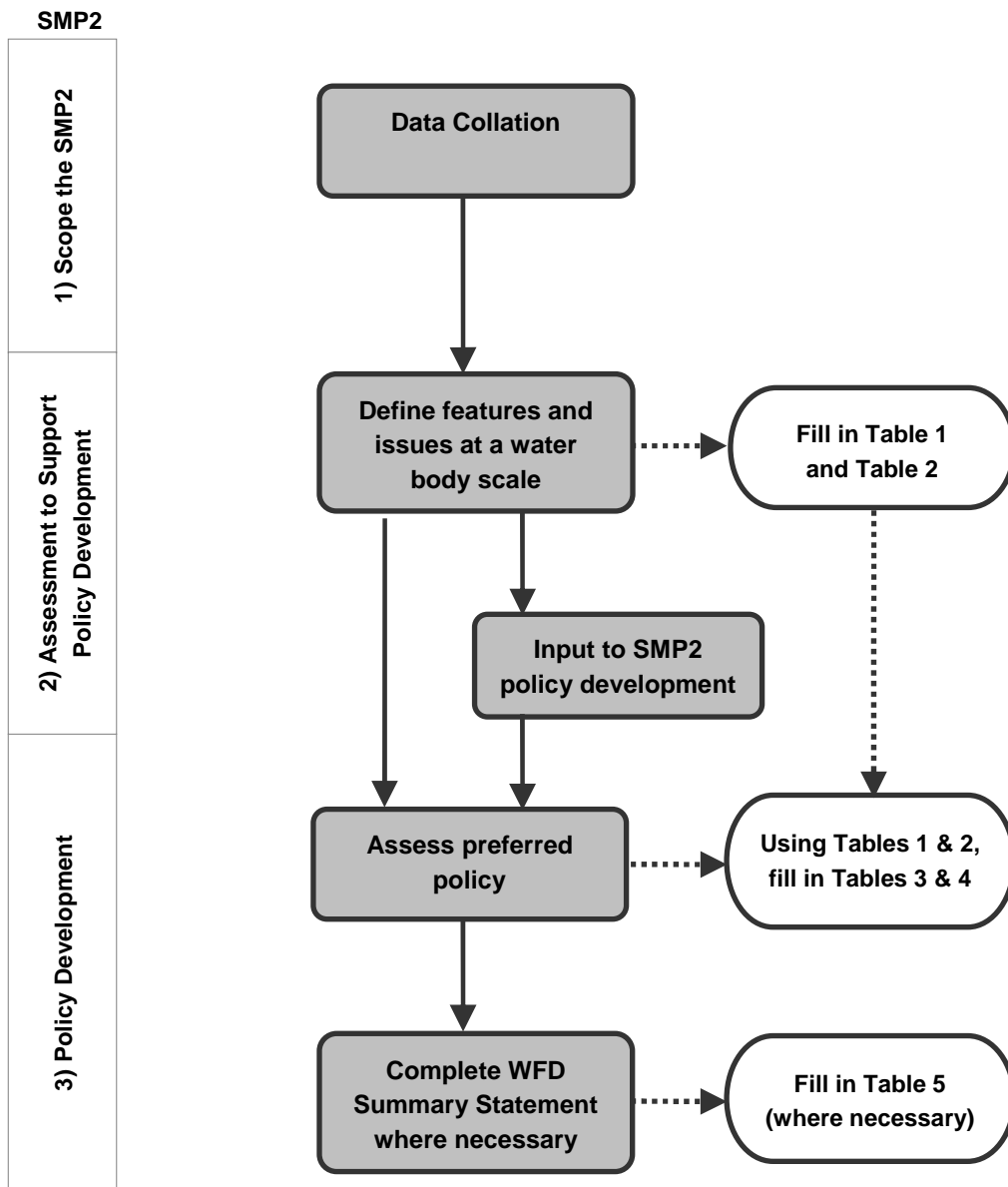
Where water bodies overlap with sites protected under EU legislation (e.g. the Birds or Habitats Directives, Shellfish Waters Directive), the Directive aims for compliance with existing standards or objectives for these sites. Therefore, where a site which is water-dependent in some way is protected via designation under another EU Directive and the Good Ecological Status or Good Ecological Potential objectives set under the Water Framework Directive would be insufficient to meet the objectives of the other relevant environmental Directive, the more stringent targets would apply (i.e. the precautionary principle).

2

ASSESSMENT METHODOLOGY

The methodology devised for this assessment follows the Guidance for the assessment of SMPs under the Water Framework Directive, which has been developed by the Environment Agency. 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, to provide a transparent and accountable assessment of the SMP2 policies (Defra, 2006). The WFD assessment process for SMPs is shown in **Figure 2.1** and these steps are described in detail in the sections below.

Figure 2.1 Water Framework Directive assessment process for SMPs



2.1 Scoping the SMP2 – Data Collation

All the Transitional and Coastal (TraC) water bodies present within the Suffolk SMP2 area were identified and their ID numbers, designation and draft 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**) have been used for the assessment of the SMP22 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.
- WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration of groundwater status.

The specific objectives for the water bodies within the Suffolk SMP2 area were also identified from the draft Anglian RBMP, which was 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.

The Environment Agency web-based 'Flood Map'² was used to assess whether there are any landward freshwater bodies that have the potential to be influenced by SMP2 policies and 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 WFD compliance mapping for groundwater risk (known as River Basin Characterisation 2 (RBC2) and status assessment). Using the RBC2 mapping and the WFD 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 of the SMP2 boundary 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 that could

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

² The Environment Agency's Flood Map is available at http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&lang=_e&textonly=off&topic=floodmap

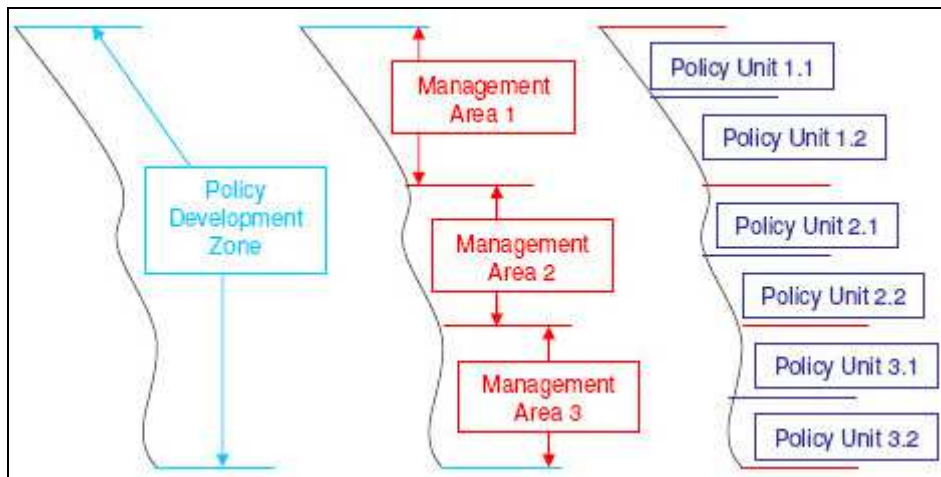
be recommended for the next round of SMPs to inform the WFD assessment, such as studies to address the zone of influence in terms of Biological Quality Elements (BQE).

2.2 Description of the Suffolk SMP2 Area

The Suffolk SMP2 Area frontage has been split into seven PDZ's as follows:

- PDZ1 – Lowestoft Ness to Benacre Ness
- PDZ2 – Benacre Ness to Easton Broad
- PDZ3 – Easton Broad to Dunwich Cliffs
- PDZ4 – Dunwich Cliffs to Thorpeness
- PDZ5 – Thorpeness to Orford Ness
- PDZ6 – Orford Ness to Cobbold's Point
- PDZ7 – Cobbold's Point to Felixstowe Port (south)

Within each 'Policy Development Zone' (PDZ) the coast has been further sub-divided into a series of 'Management Areas' (MA). Within each of these, management policies have been selected for a series of 'Policy Units' (PU), as schematised below:



The following provides a brief description of the SMP2 terminology:

Policy Development Zones

A length of coastline defined for the purpose of assessing all issues and interactions to examine and develop management scenarios. These zones are only used in the procedure of developing policy. Policy Units and Management Areas are then used for the Final definition of the policies and the management of the coast.

Management Areas

A collection of Policy Units that are interdependent and should therefore be managed collectively.

Policy Units

Sections of coastline for which a certain coastal defence management policy has been defined. These are then grouped into Management Areas for management purposes.

2.3 Defining Features and Issues

For each PDZ (within which there were a number of MA and PU) the SMP2 report provides summaries of the preferred SMP2 policy and describes how this changes from the present management; these were used to identify how the SMP2 policies could affect the WFD features (i.e. BQE of each water body). The physical parameters that could potentially be affected by SMP2 policies, and the BQE present within each water body that are dependent on these parameters were identified and are illustrated in **Assessment Table 1** for each water body.

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 2.1** were used to populate the final column of **Assessment Table 2**.

2.4 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 adaptation of the Policy Summary tables for each Policy Unit within the SMP2 report. Using the information on the water body features and issues defined in **Assessment Tables 1** and **2**, the potential impacts of the SMP2 policy for each Policy Unit (PU) was assessed in relation to aspects of the Directive and recorded in **Assessment Table 3**. For each PU, the potential changes to the relevant physical and hydromorphological parameters that might occur as a result of the SMP2 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 surface water body features (BQE) 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 (refer to **Section 2.1**). Landward freshwater bodies could potentially be impacted where the SMP2 policy for a PU 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 the SMP2 policies in **Assessment Table 3** also included consideration of the potential for impact upon GWBs. Particular attention was paid to PUs 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 PUs, 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 outcomes of the assessment for each PU were then checked against the Environmental Objectives (as set out in **Section 2.1**). For each PU, it was recorded in **Assessment Table 3** whether the SMP2 policy has the potential to meet or contribute to the potential failure of the Environmental Objectives. Following the assessment of SMP2 policies for each PU, 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 would either not be met for one or more PUs within a water body or that there would be 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 Statements were then completed for each of those necessary water bodies in **Assessment Table 5**.

3 RESULTS

3.1 Scoping the SMP2 – Data Collation

3.1.1 Transitional and Coastal water bodies (TraC)

There are ten TraC water bodies within the Suffolk SMP2 area (**Figures 3.1 to 3.8**). These include six coastal water bodies (Suffolk Coast, Benacre Broad, Covehithe Broad, Walberswick Marshes, Essex Coast and Harwich Approaches), and four transitional water bodies (Bure & Waveney and Yare & Lothing; Blyth (S); Alde & Ore; and Deben. The hydromorphological designation and Status for the TraC water bodies are shown in **Table 3-1** below.

Table 3-1 Hydromorphological Designation and Status for TraC water bodies present in the Suffolk SMP2 Area

Name of Water Body	Water body ID	Hydromorphological Designation	Reasons for Designation as HMWB	Current Overall Status	Proposed Status
Coastal					
Suffolk Coast	GB650503520002	HMWB	Coastal Protection Flood Protection	Moderate	GEP by 2027
Benacre Broad	GB610050071000	Not designated	Not designated	Moderate	NYA
Covehithe Broad	GB610050081000	Not designated	Not designated	Moderate	NYA
Walberswick Marshes	GB610050076000	HMWB	Flood Protection	Good	Remain at GEP
Essex Coast	GB650503520001	HMWB	Coastal Protection Flood Protection	Moderate	GEP by 2027
Harwich Approaches	GB650503020000	HMWB	Coastal Protection Navigation Dredge Disposal	Good	Remain at GEP
Transitional					
Bure &Waveney etc.	GB510503410700	HMWB	Flood Protection Navigation Structure	Moderate	GEP by 2027
Blyth (S)	GB510503503700	HMWB	Coastal Protection Flood Protection	Moderate	GEP by 2027
Alde & Ore	GB520503503800	HMWB	Flood Protection	Moderate	GEP by 2027
Deben	GB520503503900	HMWB	Flood Protection	Moderate	GEP by 2027

HMWB = Heavily Modified Water body; NYA =Not Yet Assessed; GEP = Good Ecological Potential

As **Table 3-1** shows only Benacre Broad and Covehithe Broad are not designated as Heavily Modified. Of the HMWB that have been identified two are currently at Good Ecological Potential (GEP). This therefore means that under present defence policy these two water bodies are at GEP and a continuation of this policy would not result in deterioration in ecological potential. The remaining HMWB water bodies are at Moderate potential and must therefore aim to reach GEP by 2027.

3.1.2 Freshwater bodies (FWBs)

After consulting the Environment Agency's Flood Map and the Environment Agency's Anglian draft RBMP, several areas where the SMP2 policies could potentially impact upon landward FWBs were identified. Any River or Lake water bodies present within these risk areas were identified. FWBs that may be affected by the defence policies include the following:

- Lothingland Hundred Freshwater Body (FWB) (GB105035046250);
- Leiston Beck FWB (GB105035046270); and
- Hundred River FWB (GB105035046260).

3.1.3 Groundwater bodies (GWBs)

The Suffolk SMP2 covers three groundwater bodies, as illustrated in **Figures 3.9** and **3.10**. These GWBs comprise:

- Broadland Rivers and Chalk (GB40501G400300);
- Waveney and East Suffolk Chalk and Crag (GB40501G400600); and
- Felixstowe Peninsula Crag and Chalk (GB40501G401800).

Along the coastline of the SMP2, the solid geology comprises the Crag Group, which is further subdivided into the Red Crag and the Norwich Crag. The Norwich Crag is present along the northern section of the coastline to just south of Aldeburgh, with the Red Crag outcropping along the southern section of this SMP2. The Norwich Crag comprises fine to medium grained sands, interbedded with clays and is approximately 35 m thick near to Southwold. The Red Crag is described as comprising poorly-sorted, cross-bedded, medium to coarse-grained shelly sands. Near to Aldeburgh the Red Crag is estimated to be around 40 m thick. The Environment Agency has classified the Crag Group as a minor aquifer, which means that it is locally important for water supplies and for supplying baseflows to rivers. Groundwater flow within the Crag aquifer is intergranular, rather than through faults and fissures and the flow is controlled by the alternating layers of clays, silts and sands. The direction of flow is towards the coast, i.e. from west to east. The Crag aquifer is unconfined with recharge occurring over its whole extent. It has been observed that pumped drainage of the marshes along the coastline has resulted in saline intrusion near the coast or tidal rivers.

The Crag Group is underlain by Chalk, which is defined as a Major aquifer by the Environment Agency. Flow through the Chalk is generally through faults and fissures.

All three GWBs have been assigned by the Environment Agency as being at Good status (low confidence) under WFD (**Figure 3.9**). However, they have all been determined to be 'At Risk' for saline intrusion under RBC2 (**Figure 3.10**). As such there is evidence to suggest that the SMP2 policies may cause deterioration in status.

3.1.4 Boundary issues

As **Figure 3.11** shows the boundary between the Suffolk SMP 2 area and the Suffolk Coast water body is not consistent. There is the potential therefore for the movement of the Suffolk Coast water body boundary southwards so that it ends where the Suffolk SMP2 begins, thus moving the Norfolk East Coast water body boundary southwards as well. The Suffolk SMP2 and the Suffolk Coast water body would then begin at the same point. Initial examination of the potential for this would suggest that such a move would correspond with both coastal processes and coastal geomorphology in this area. Further investigation is recommended.

In addition there is inconsistency at the southern extent of the Suffolk SMP2 (PDZ 7 boundary) (see **Figure 3.8**). The PDZ 7 boundary includes part of the Essex Coast water body and part of the Harwich Approaches water body. Further examination should be considered to align these boundaries more consistently.

Figure 3-1 Overview of SMP2 Study Area and WFD water bodies

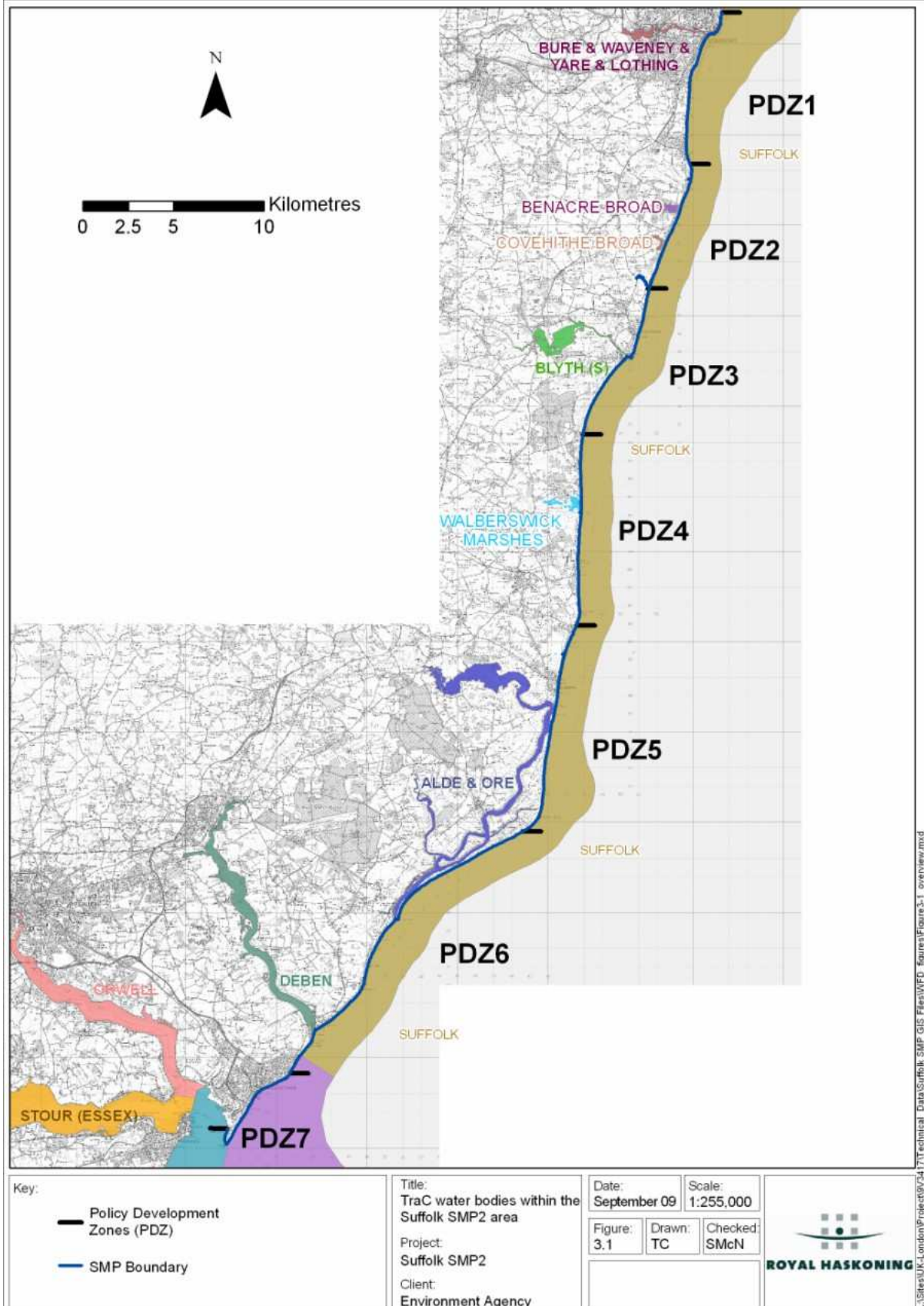


Figure 3-2: Water bodies within PDZ1

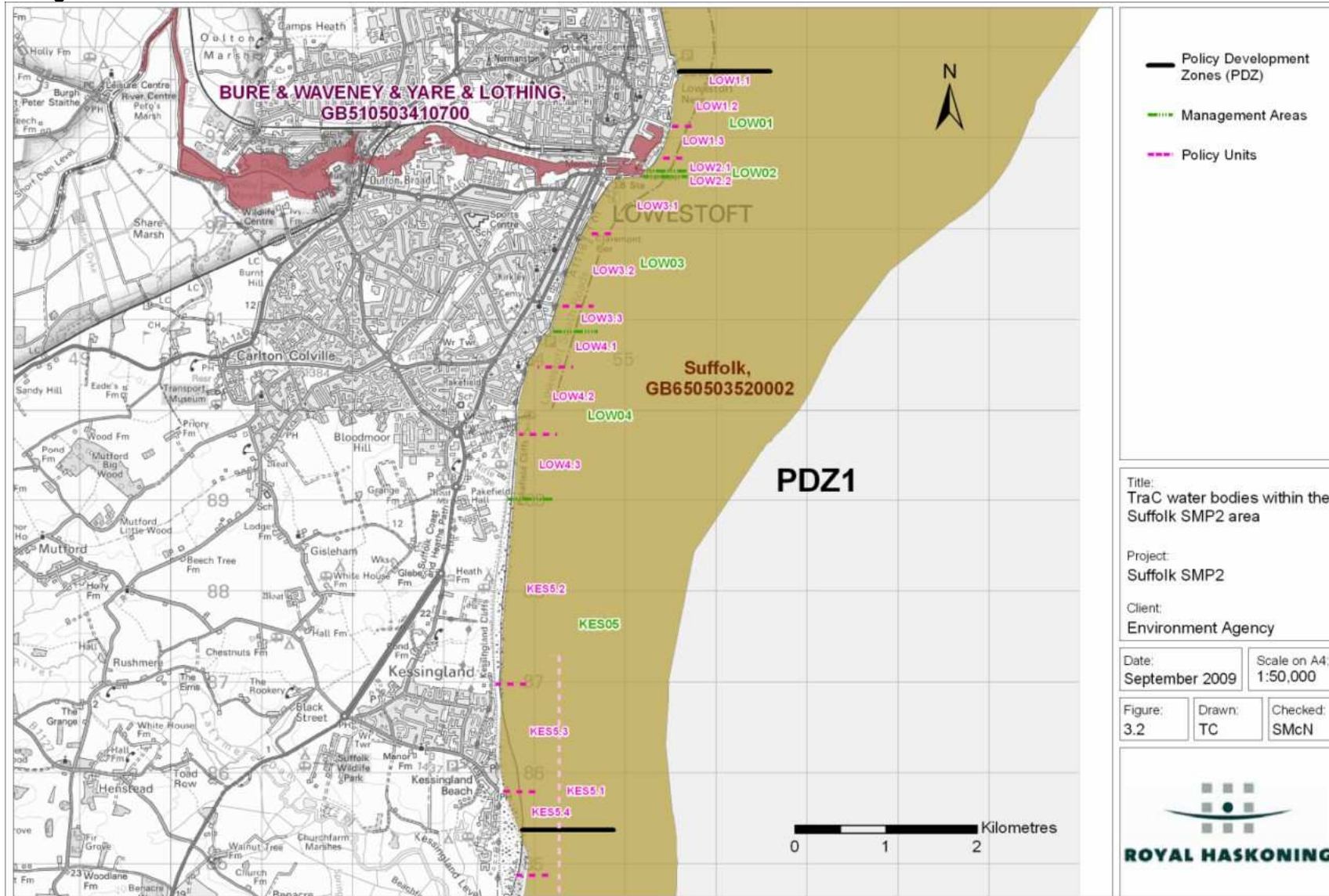
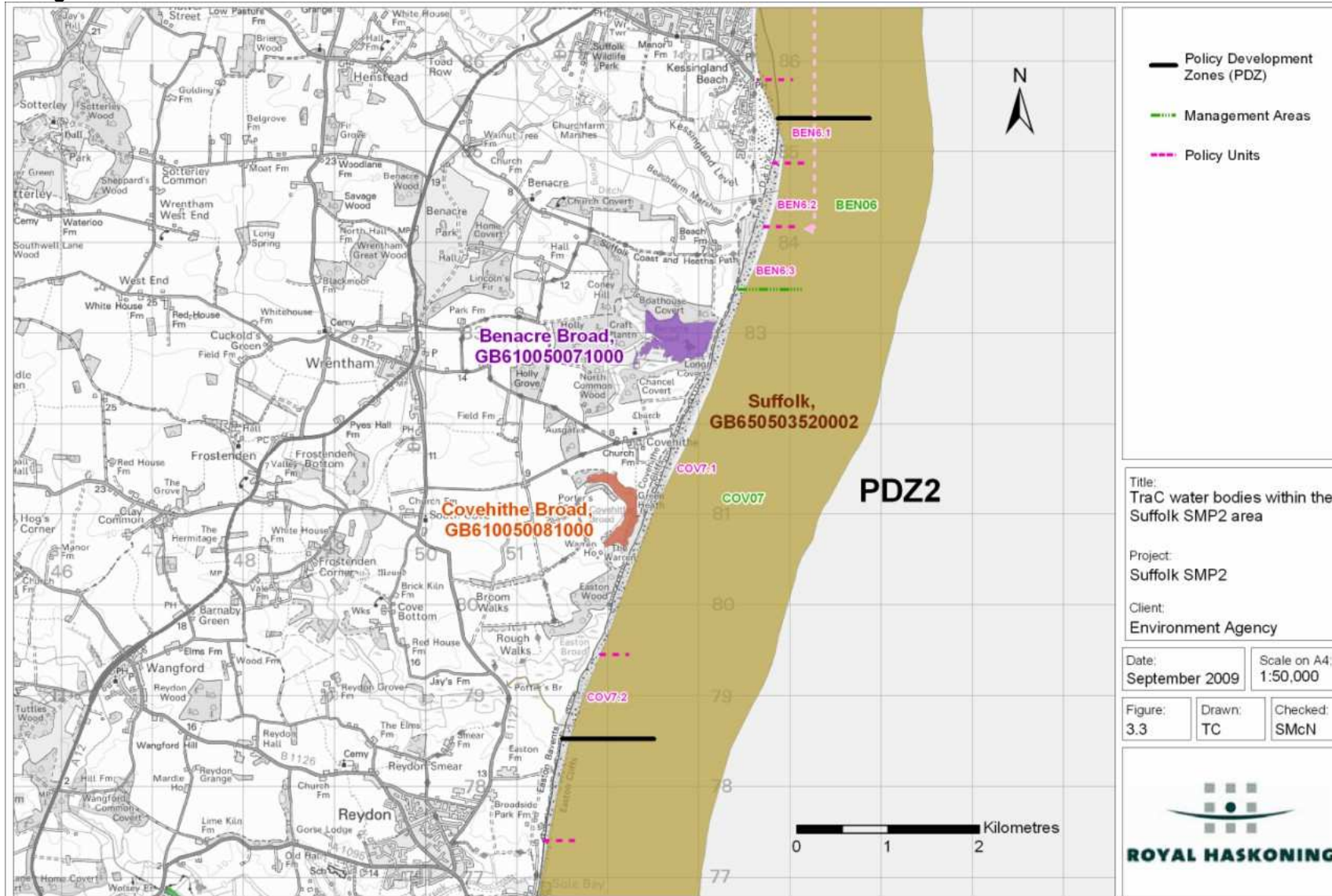


Figure 3-3: Water bodies within PDZ2



-  Policy Development Zones (PDZ)
-  Management Areas
-  Policy Units

Title:
TraC water bodies within the Suffolk SMP2 area

Project:
Suffolk SMP2

Client:
Environment Agency

Date: September 2009	Scale on A4: 1:50,000
Figure: 3.3	Drawn: TC
Checked: SMcN	



Figure 3-4: Water bodies within PDZ 3

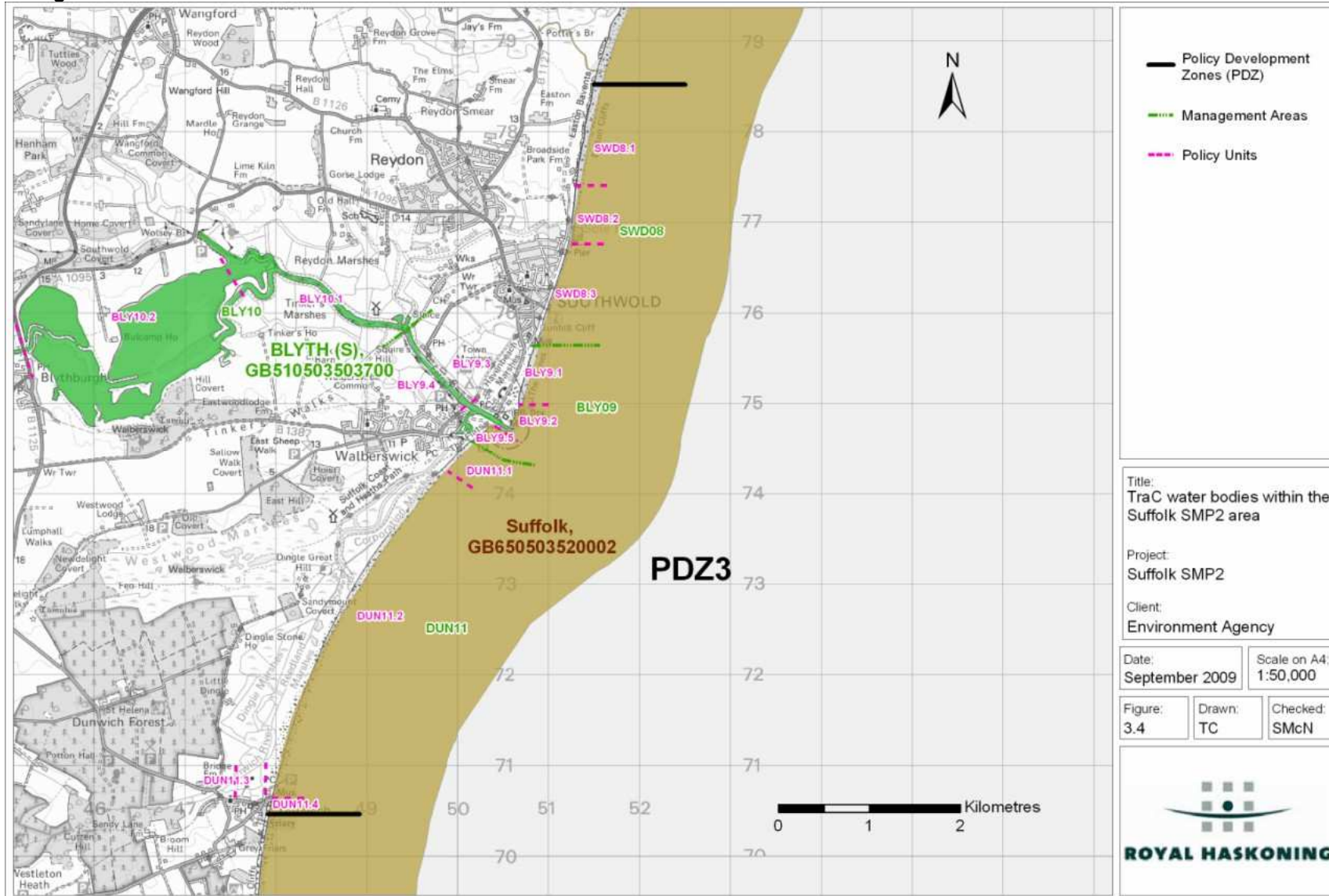


Figure 3-5: Water bodies within PDZ4

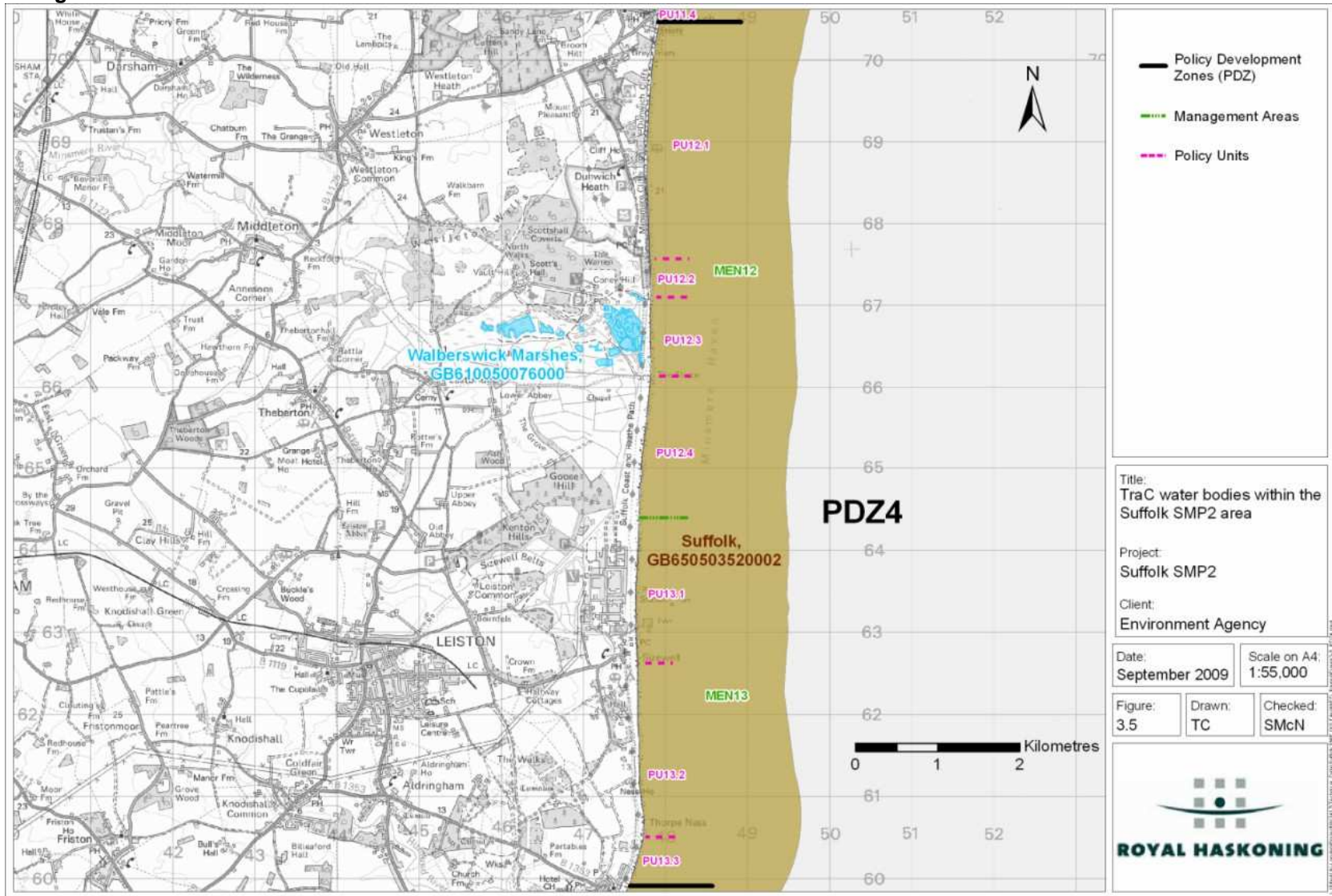


Figure 3-6: Water bodies with PDZ

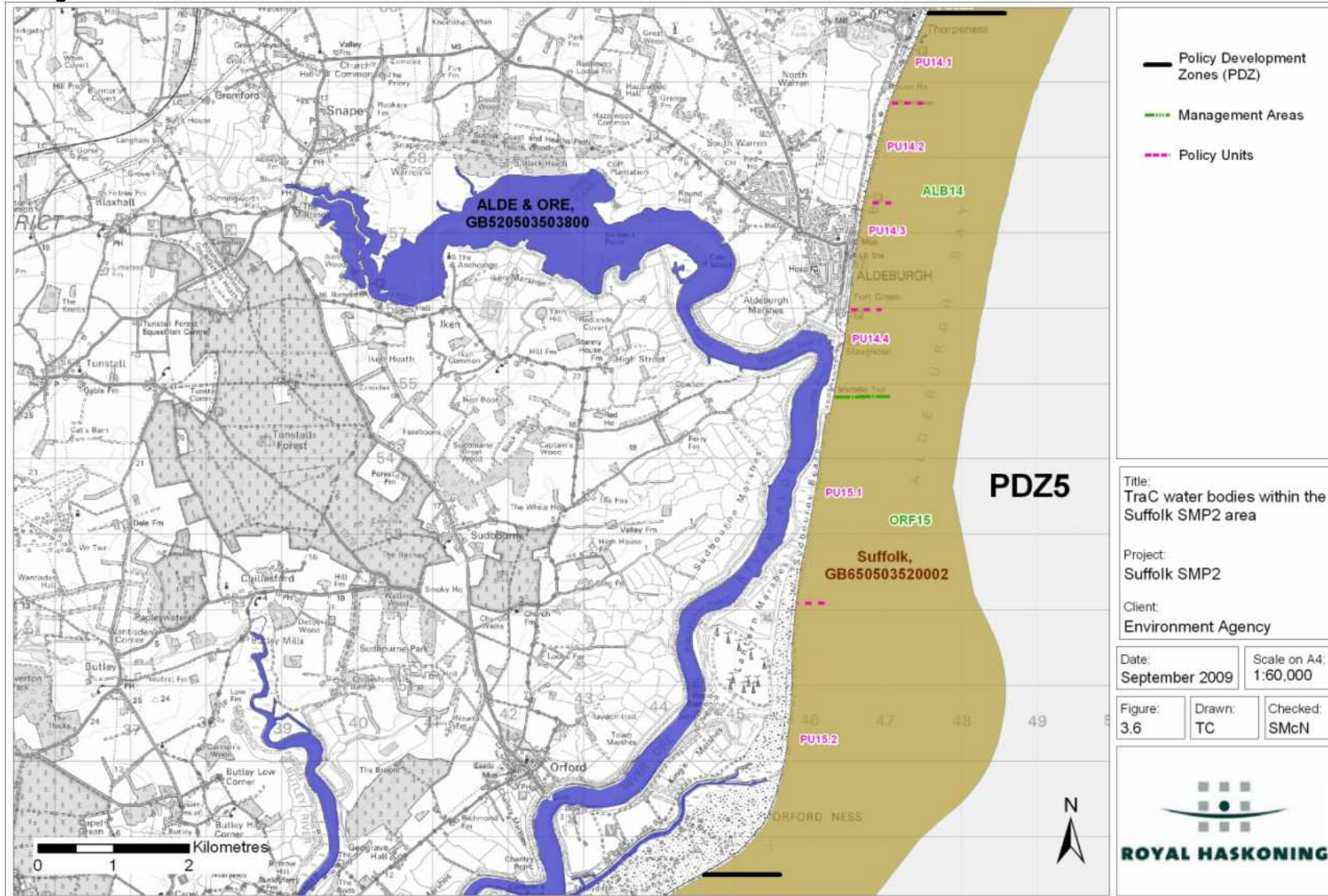


Figure 3-7: Water bodies within PDZ6

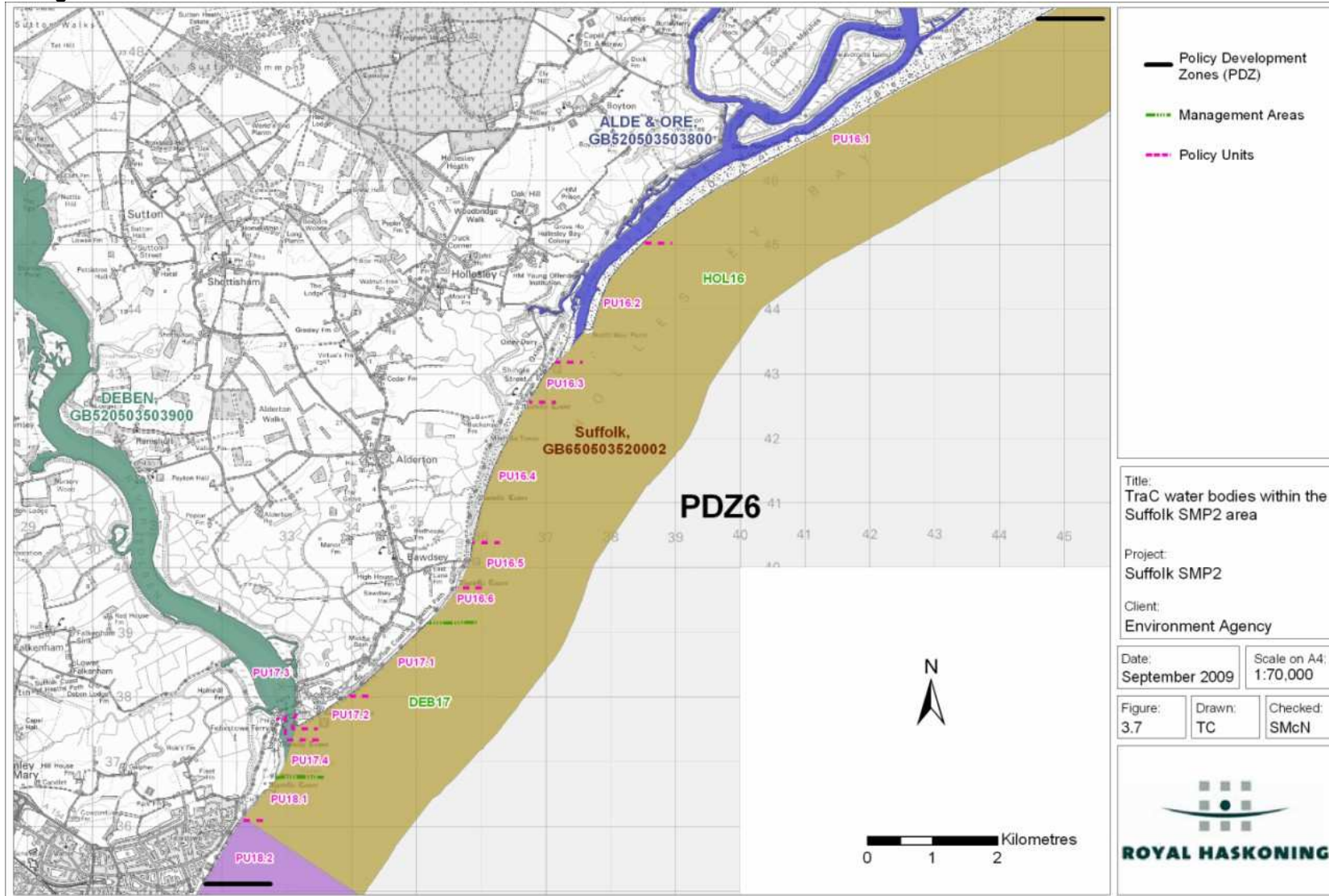


Figure 3-8: Water bodies within PDZ7

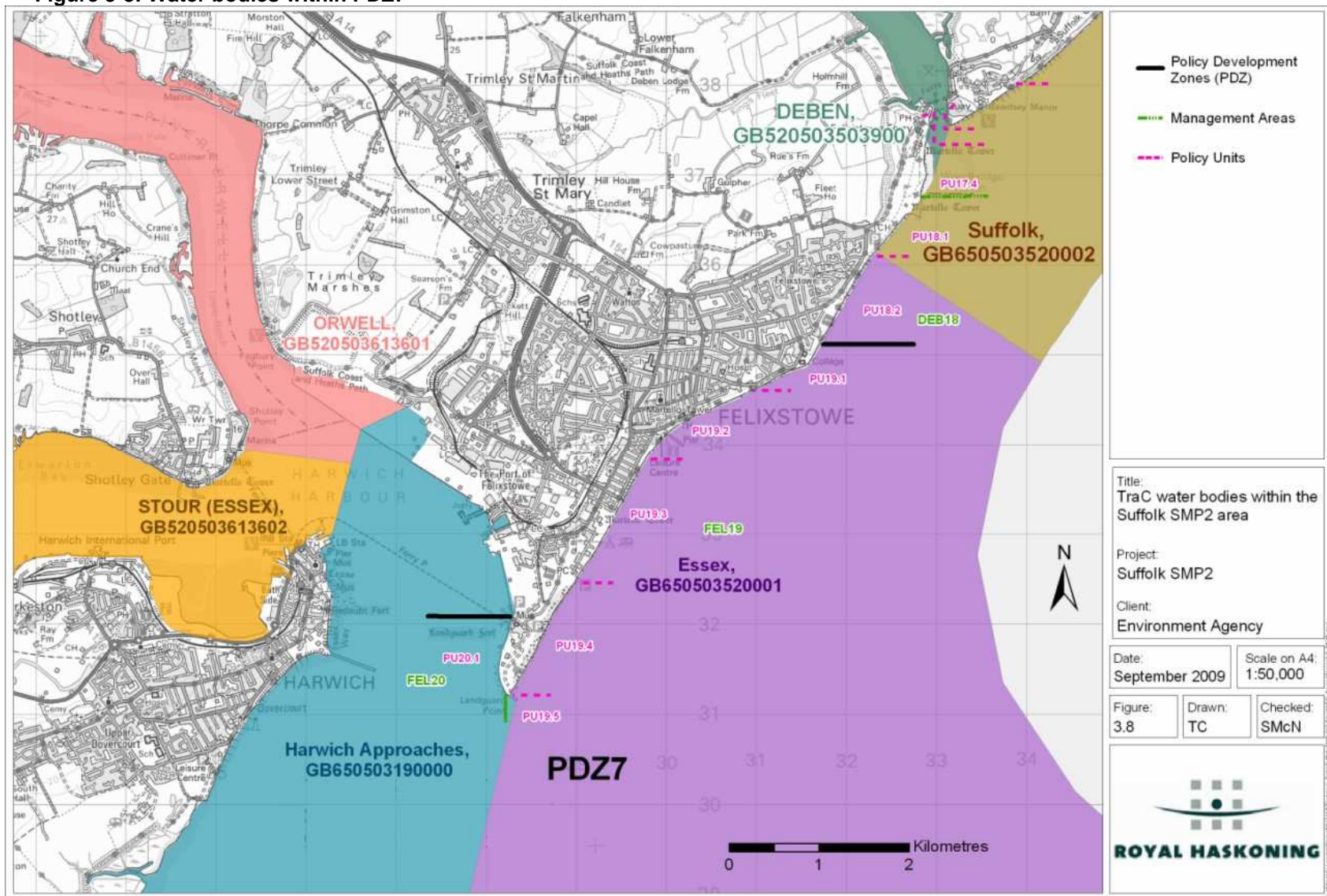


Figure 3-9: Groundwater bodies present within the SMP2 Study area (see Section 3.1.3)

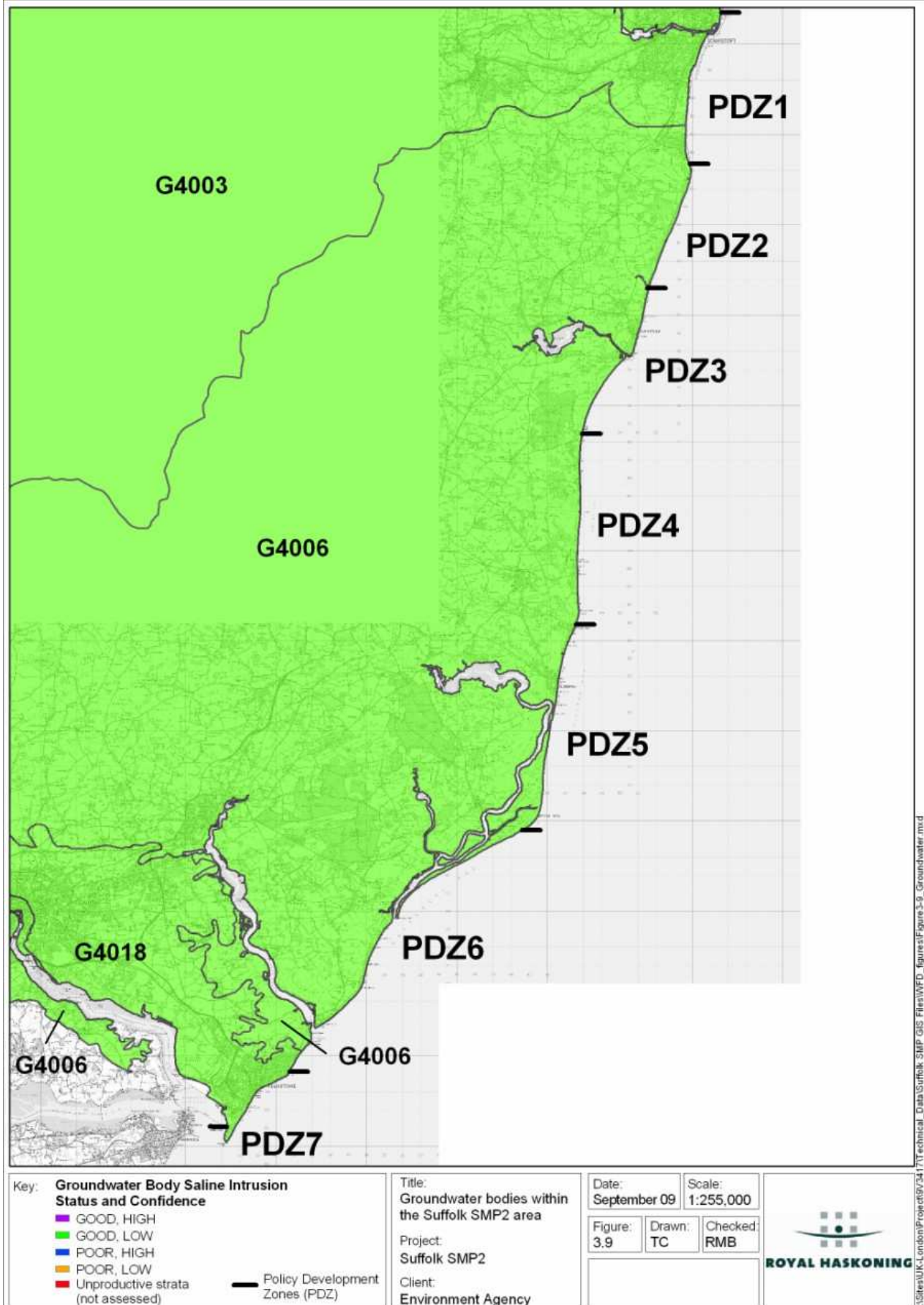


Figure 3.10: Groundwater Body Risk Categories

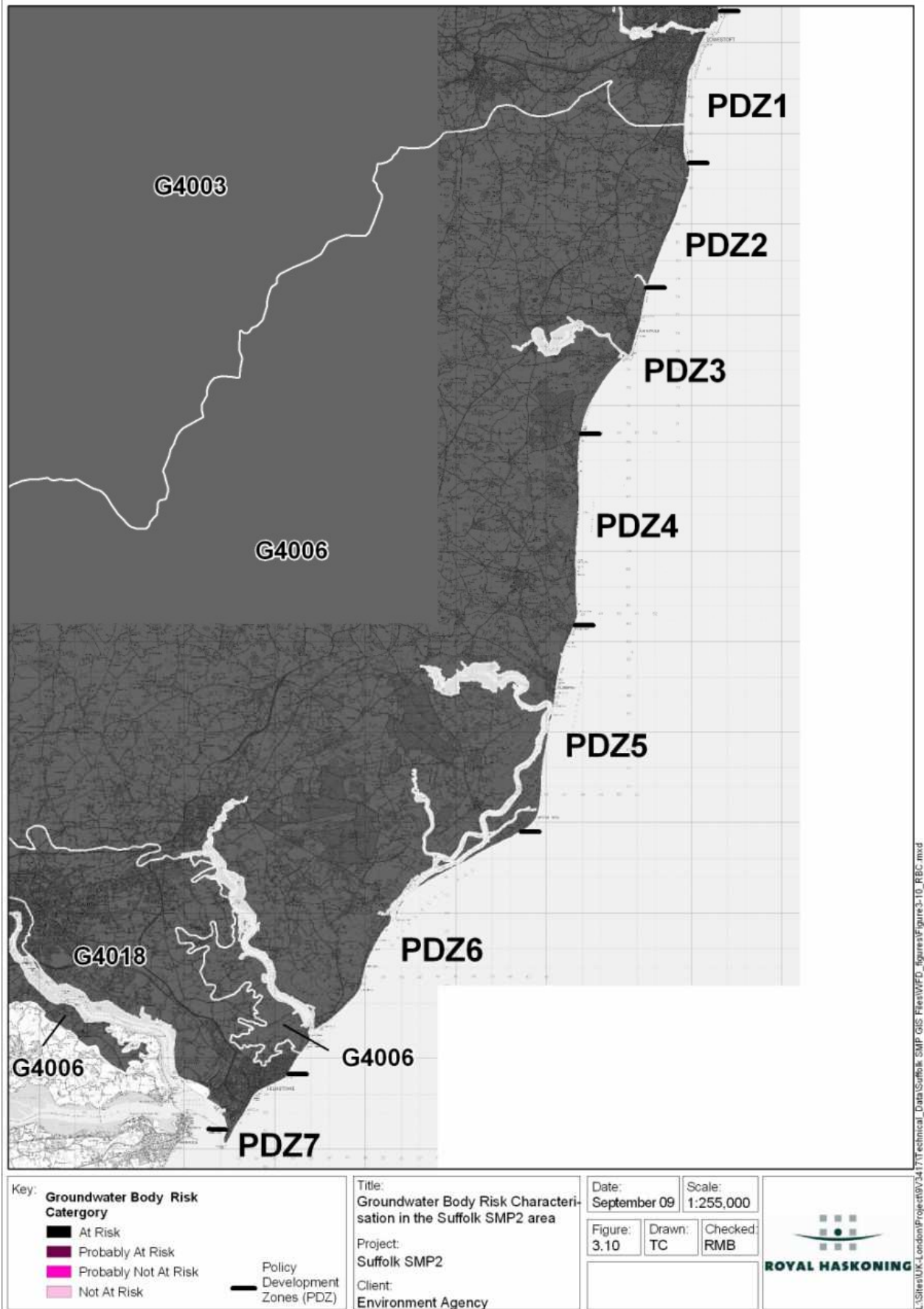
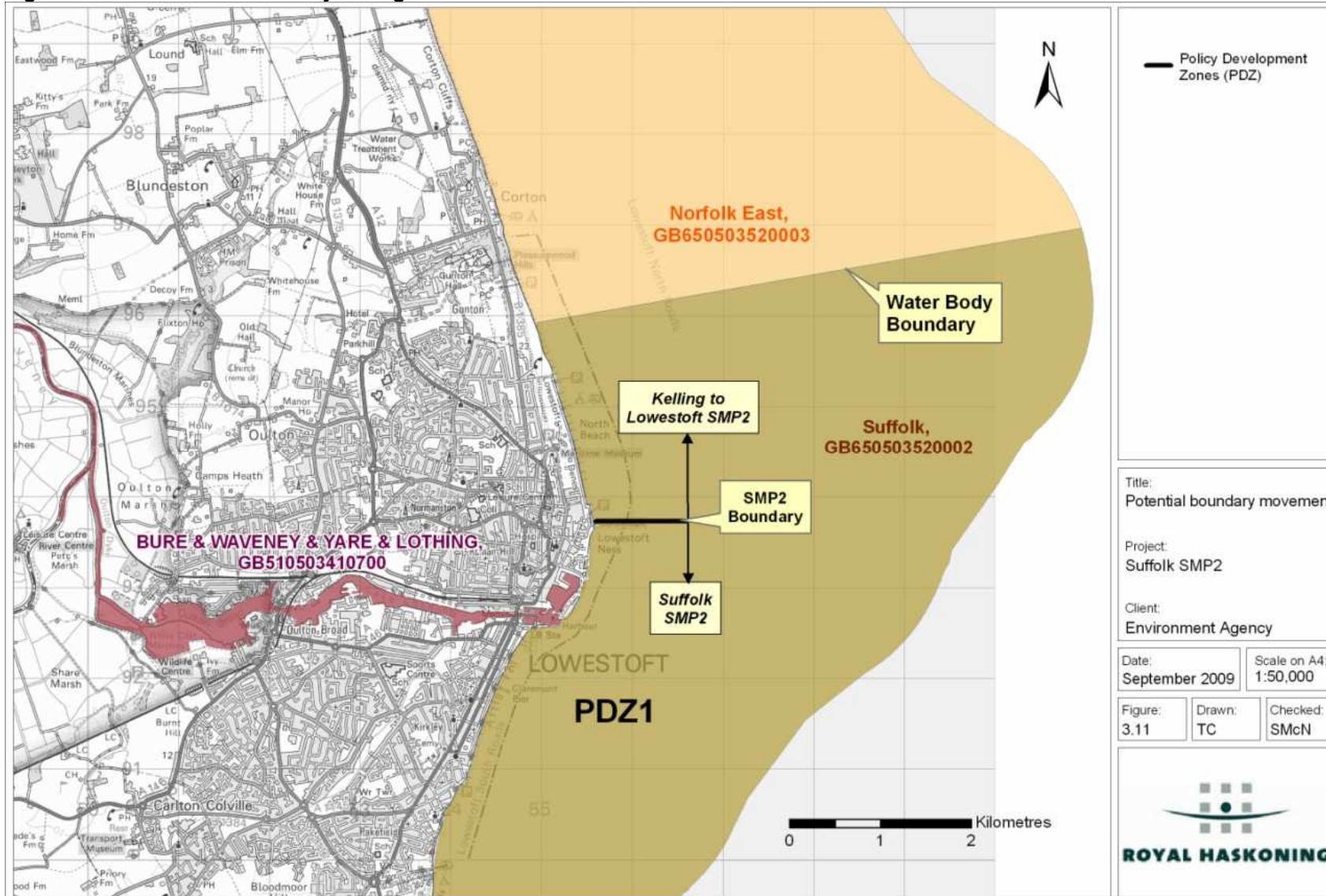


Figure 3-101: Potential Boundary Changes



3.2 Defining Features and Issues

For the TraC water bodies in the Suffolk SMP2 area, the hydromorphological parameters that could potentially be affected by SMP2 policies and the BQE 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.

There are no High Status water bodies in the Suffolk SMP2.

Assessment Table 1 BQE within TraC water bodies that could be affected by changes to hydromorphology as a result of relevant SMP2 policies

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

Biological Quality Element (BQE)	Potential for change in physical or hydromorphological parameter	Suffolk Coast	Benacre Broad (Coastal)	Covehithe Broad (Coastal)	Walberswick Marshes (Coastal)	Essex Coast (Coastal)	Harwich Approaches (Coastal)	Bure & Waveney etc. (Transitional)	Blyth (S) (Transitional)	Alde & Ore (Transitional)	Deben (Transitional)
Phytoplankton	Residence time		✓	✓	✓			✓			
	Water depth		✓	✓	✓			✓			
	Thermal regime		✓	✓	✓			✓			
	Turbidity		✓	✓	✓			✓			
Macroalgae	Episodicity (at low end of velocity spectrum)					✓	✓	✓	✓	✓	✓
	Salinity		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Abrasion (associated to velocity)	✓									
Angiosperms	Inundations (tidal regime)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Sediment loading	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Land elevation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Salinity		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Abrasion (associated to velocity)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Benthic/macro invertebrates	Beach water table (TraC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Light										
	Groundwater connectivity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Availability of leaf litter/organic debris		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Connectivity with riparian zone										

Biological Quality Element (BQE)	Potential for change in physical or hydromorphological parameter	Suffolk Coast	Benacre Broad (Coastal)	Covehithe Broad (Coastal)	Walberswick Marshes (Coastal)	Essex Coast (Coastal)	Harwich Approaches (Coastal)	Bure & Waveney etc. (Transitional)	Blyth (S) (Transitional)	Alde & Ore (Transitional)	Deben (Transitional)
Fish	Heterogeneity of habitat (substrate, provision of shelter)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Continuity for 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 Suffolk SMP2 (colour shading equivocates to the shaded water bodies in Figures 3.1 to 3.8)

Feature		Issue	Water body Classification and Environmental Objectives
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
Suffolk Coast (PU LOW1.1 – DEB 18.1)	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated to velocity) as a result of SMP2 policies. For example, changes to control structures or defences may result in changes in wave and current dynamics and subsequent changes in abrasion patterns.	Classification: Moderate Status (cHMWB) <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 groundwater status.
	Angiosperms	There is potential for changes in the frequency of tidal inundations, sediment loading, land elevation and abrasion (associated to velocity) which may impact upon angiosperms. In particular, there is potential for impact on shingle and dune flowering plants as this SMP2 has large stretches of shingle and sand dune habitat. The policy options for these sections of coastline have the potential to result in changes to the shingle and dune habitat extent.	
	Benthic/macro invertebrates	SMP2 policies have the potential to cause changes in the beach water table and/or the groundwater connectivity upon which invertebrates are dependent.	
	Fish	Potential impacts on fish due to changes in substrate conditions and/or accessibility to nursery areas.	
Benacre Broad (PU COV 7.1)	Phytoplankton	There is potential for SMP2 policies to result in changes in residence time, water depth, thermal regime and turbidity within this lagoon system. The lagoons will potentially experience greater occurrences of overtopping from the sea and possibly even a breach, which could potentially impact upon phytoplankton	Classification: Status not yet assessed (not designated) <ul style="list-style-type: none"> WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or

Feature		Issue	Water body Classification and Environmental Objectives
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
		populations both temporarily or possibly permanently.	<p>result in a deterioration of surface water Ecological 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 groundwater status.
	Macroalgae	SMP2 policies have the potential to impact upon macroalgae through changes in the salinity gradient in the lagoons. There is also potential for policies to result in changes in abrasion (associated to velocity) which could impact macroalgae should a breach occur.	
	Angiosperms	SMP2 policies have the potential to impact angiosperms through changes to tidal inundations, sediment loading, land elevation and abrasion (associated to velocity). Angiosperms present in this water body adapted to saline lagoons include eel grass, reeds and tassel weed. If NAI is the preferred policy then in time the coastal water body will become part of the Suffolk Coast water body which may have impacts upon angiosperm populations.	
	Benthic/macro invertebrates	There is potential for changes to groundwater connectivity and/or the beach water table through changes in wave and erosion patterns within this enclosed water body. Increased overtopping and erosion of the shingle barrier may lead to changes in salinity with consequences for lagoonal species. The lagoon also supports a number of specialist lagoonal species including the anemone <i>Nematostella vectensis</i>	
	Fish	Potential impacts on fish due to changes in substrate conditions, heterogeneity of habitats and/or accessibility to nursery areas. Erosion of the shingle ridge could lead to greater wave/tidal/current	

Feature		Issue	Water body Classification and Environmental Objectives
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
		exposure and a subsequent change from fine sediment associated with sheltered conditions to more coarse sediment associated with exposed conditions.	
Covehithe Broad (PU COV 7.1)	Phytoplankton	There is potential for SMP2 policies to result in changes in residence time, water depth, thermal regime and turbidity within this lagoon system. The lagoons will potentially experience greater occurrences of overtopping from the sea and possibly even a breach, which could potentially impact upon phytoplankton populations both temporarily or possibly permanently.	Classification: Status not yet assessed (not designated) <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 groundwater status.
	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated to velocity) as a result of SMP2 policies. For example, changes to natural control points, control structures or defences may result in changes in wave and current dynamics and subsequent changes in abrasion patterns.	
	Angiosperms	SMP2 policies have the potential to impact angiosperms through changes to tidal inundations, sediment loading, land elevation and abrasion (associated to velocity). Angiosperms present in this water body adapted to saline lagoons include eel grass, reeds and tassel weed. If NAI is the preferred policy then in time the coastal water body will become part of the Suffolk Coast water body which may have impacts upon angiosperm populations.	
	Benthic/macro invertebrates	There is potential for changes to groundwater connectivity and/or the beach water table through changes in wave and erosion	

Feature		Issue	Water body Classification and Environmental Objectives
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
		patterns within this enclosed water body. Increased overtopping and erosion of the shingle barrier may lead to changes in salinity with consequences for lagoonal species.	
	Fish	Potential impacts on fish due to changes in substrate conditions, heterogeneity of habitats and/or accessibility to nursery areas. Erosion of the shingle ridge could lead to greater wave/tidal/current exposure and a subsequent change from fine sediment associated with sheltered conditions to more coarse sediment associated with exposed conditions.	
Walberswick Marshes (PU MIN 12.1 – 12.4)	Phytoplankton	There is potential for SMP2 policies to result in changes in residence time, water depth, thermal regime and turbidity within the lagoon system. The lagoons will potentially experience greater occurrences of overtopping from the sea and possibly even a breach, which could potentially impact upon phytoplankton populations both temporarily or possibly permanently.	Classification: Not yet assessed (cHMWB) <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 groundwater status.
	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated to velocity) as a result of SMP2 policies. For example, changes to natural control points, control structures or defences may result in changes in wave and current dynamics and subsequent changes in abrasion patterns.	
	Angiosperms	SMP2 policies have the potential to impact angiosperms through changes in the frequency of tidal inundations, sediment loading, land elevation and abrasion (associated to velocity). Angiosperms	

Feature		Issue	Water body Classification and Environmental Objectives
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
		present in this water body adapted to saline lagoons include eel grass, reeds and tassel weed. If NAI is the preferred policy then in time the coastal water body will become part of the Suffolk Coast water body which may have impacts upon angiosperm populations.	<ul style="list-style-type: none"> Proposed Status Objective (from the draft RBMP for the Anglian RBD): Good Status by 2027.
	Benthic/macro invertebrates	There is potential for changes to groundwater connectivity and/or the beach water table through changes in wave and erosion patterns within this enclosed water body. Increased overtopping and erosion of the shingle barrier may lead to changes in salinity with consequences for lagoonal species.	
	Fish	Potential impacts on fish due to changes in substrate conditions, heterogeneity of habitats and/or accessibility to nursery areas. Erosion of the shingle ridge could lead to greater wave/tidal/current exposure and a subsequent change from fine sediment associated with sheltered conditions to more coarse sediment associated with exposed conditions.	
Essex Coast (PU DEB 18.1-FEL 19.5)	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated to velocity) as a result of SMP2 policies. For example, changes to defences may result in changes in wave and current dynamics and subsequent changes in abrasion patterns.	Classification: Moderate Status (cHMWB). <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
	Angiosperms	There is potential for changes in the frequency of tidal inundations, sediment loading, land elevation and abrasion (associated to velocity) which may impact upon angiosperms.	
	Benthic/macro	SMP2 policies have the potential to cause changes in the beach	

Feature		Issue	Water body Classification and Environmental Objectives
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
	invertebrates	water table and/or the groundwater connectivity upon which invertebrates are dependent.	<p>or compromise the Environmental Objectives being met in other water bodies.</p> <ul style="list-style-type: none"> WFD4: No changes that will cause failure to meet good groundwater status or result in a deterioration groundwater status.
	Fish	Potential impacts on fish due to changes in substrate conditions and/or accessibility to nursery areas.	
Harwich Approaches (PU FEL 19.5 – FEL 20.1)	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated to velocity) as a result of SMP2 policies. For example, changes to control structures or defences may result in changes in wave and current dynamics and subsequent changes in abrasion patterns.	<p>Classification: Not Yet Assessed (cHMWB).</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 groundwater status.
	Angiosperms	There is potential for changes in the frequency of tidal inundations, sediment loading, land elevation and abrasion (associated to velocity) which may impact upon angiosperms.	
	Benthic/macro invertebrates	SMP2 policies have the potential to cause changes in the beach water table and/or the groundwater connectivity upon which invertebrates are dependent.	
	Fish	Potential impacts on fish due to changes in substrate conditions and/or accessibility to nursery areas.	
Bure & Waveney etc. (Low 1.1 – Low 2.2)	Phytoplankton	There is potential for SMP2 policies to result in changes in residence time, water depth, thermal regime and turbidity within this sheltered transitional water body.	<p>Classification: Moderate Status (cHMWB).</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
	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated to velocity) as a result of SMP2 policies. For example, changes to control structures or defences may result in changes in	

Feature		Issue	Water body Classification and Environmental Objectives
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
		wave and current dynamics and subsequent changes in abrasion patterns.	Status or Potential. <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 groundwater status.
	Angiosperms	There is potential for changes in the frequency of tidal inundations, sediment loading, land elevation and abrasion (associated to velocity) which may impact upon angiosperms	
	Benthic/macro invertebrates	SMP2 policies have the potential to cause changes in the intertidal water table and/or the groundwater connectivity upon which invertebrates are dependent.	
	Fish	Potential impacts on fish due to changes in substrate conditions and/or accessibility to nursery areas.	
Blyth (S) (PU BLY 9.1-9.5; BLY 10.1 – 10.3	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated to velocity) as a result of SMP2 policies. For example, changes to control structures or defences may result in changes in wave and current dynamics and subsequent changes in abrasion patterns.	Classification: Moderate Status (cHMWB). <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 groundwater status.
	Angiosperms	There is potential for changes in the frequency of tidal inundations, sediment loading, land elevation and abrasion (associated to velocity) which may impact upon angiosperms	
	Benthic/macro invertebrates	SMP2 policies have the potential to cause changes in the beach water table and/or the groundwater connectivity upon which invertebrates are dependent.	
	Fish	Potential impacts on fish due to changes in substrate conditions and/or accessibility to nursery areas.	
Alde & Ore	Macroalgae	Potential changes to macroalgae through changes in abrasion	Classification: Not Yet Assessed (cHMWB).

Feature		Issue	Water body Classification and Environmental Objectives
Water Body (Policy Development Zones)	Biological Quality Element	Changes to BQE physical and/or hydromorphological dependencies	
(PU ALB 14.4 – HOL 16.3)		(associated to velocity) as a result of SMP2 policies. For example, changes to control structures or defences may result in changes in wave and current dynamics and subsequent changes in abrasion patterns.	<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 groundwater status.
	Angiosperms	There is potential for changes in the frequency of tidal inundations, sediment loading, land elevation and abrasion (associated to velocity) which may impact upon angiosperms	
	Benthic/macro invertebrates	SMP2 policies have the potential to cause changes in the beach water table and/or the groundwater connectivity upon which invertebrates are dependent.	
	Fish	Potential impacts on fish due to changes in substrate conditions and/or accessibility to nursery areas.	
Deben (PU DEB 17.3)	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated to velocity) as a result of SMP2 policies. For example, changes to control structures or defences may result in changes in wave and current dynamics and subsequent changes in abrasion patterns.	Classification: Moderate Status (cHMWB). <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 groundwater status.
	Angiosperms	There is potential for changes in the frequency of tidal inundations, sediment loading, land elevation and abrasion (associated to velocity) which may impact upon angiosperms	
	Benthic/macro invertebrates	SMP2 policies have the potential to cause changes in the beach water table and/or the groundwater connectivity upon which invertebrates are dependent.	
	Fish	Potential impacts on fish due to changes in substrate conditions and/or accessibility to nursery areas.	

3.3 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 PU scale. Further to the PU 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 SMP2 to ensure transparency and to provide an auditable account of how conclusions were made. The process enables key potential areas of concern to be flagged up and considered later at the strategy or scheme level.

The potential for the policies to affect freshwater bodies (both designated as FWBs or not) should highlight the possible issues in defending those FWBs from tidal inundation and flooding through sea level rise.

Assessment Table 3 WFD Assessment of SMP2 Policy for the Suffolk SMP2 (colour shading corresponds to the shaded water bodies in Figures 3.1 to 3.8)
(Note: WFD 1 is not included in the Table as there are no High Status water bodies present in the SMP2 Study area. Although Benacre Broad and Covehithe Broad have not been assigned a Hydromorphological Designation it is not possible at this stage to determine whether WFD 1 is applicable or not at this stage).

SMP2 Preferred Policies: HTL = Hold The Line; NAI = No Active Intervention; MR = Managed Realignment).

Policy Development Zone		Management Area		Policy Unit		Preferred Policy			WFD Assessment of Deterioration			
						2025	2055	2105		WFD 2	WFD 3	WFD 4
PDZ1	Lowestoft Ness to Benacre Ness	LOW 01	Lowestoft Ness and Outer Harbour	1.1	Lowestoft Ness	HTL	HTL	HTL	<p>SMP2 policies within this PDZ have the potential to affect ecological status in two water bodies; Suffolk Coast and Bure & Waveney Transitional water body. The Suffolk Coast water body runs along the entire frontage of the PDZ whilst Lake Lothing in the inner harbour forms part of the Bure & Waveney Transitional water body.</p> <p>The preferred policies for Low 01 are to HTL. As the area of intertidal habitat here is quite narrow and effectively consists of the rock breakwater the preferred policy is unlikely to affect BQE within this management area and deterioration in ecological status is unlikely.</p> <p>The HTL policy for the Inner Harbour may result in the loss of intertidal habitat as rising sea levels squeeze against the static sea defences. However at present BQE that are at Good or High Status include invertebrates and macroalgae that are less susceptible to coastal squeeze. This indicates that under the present HTL policy these BQE are supportive of achieving GEP and deterioration in ecological potential is therefore unlikely.</p> <p>In the long term there may be opportunity to create new intertidal habitat by opening up areas such as Leathes Ham on the northern side of Lake Lothing.</p> <p>The HTL policy at South Beach in the first two epochs aims to retain sediment along the foreshore.</p>	✓	✓	✓
				1.2	Hamilton Docks	HTL	HTL	HTL		✓	✓	✓
				1.3	South Pier	HTL	HTL	HTL		✓	✓	✓
		LOW 02	Inner Harbour	2.1	Northern side	HTL	HTL	HTL		✓	✓	✓
				2.2	Southern side	HTL	HTL	HTL		✓	✓	✓
		LOW 03	South Beach	3.1	North	HTL	HTL	HTL		✓	✓	✓
				3.2	South	HTL	HTL	HTL		✓	✓	✓
				3.3	Pakefield Road	HTL	HTL	HTL		✓	✓	✓
		LOW 04	Pakefield	4.1	Southern Promenade	HTL	HTL	HTL		✓	✓	✓

				4.2	Pakefield	HTL	HTL	MR	<p>The long-term plan for Pakefield (Low 04) is managed realignment of the whole area while holding the line in specific sections. HTL at PU4.1 will allow sediment to be retained along this frontage and will therefore not lead to a loss of habitat. MR in epoch 3 for PU 4.2 and NAI in PU4.3 will allow the coastline to roll back to form a more natural coastline in equilibrium with coastal processes. Intertidal habitat will therefore be allowed to adapt to rising sea levels with no predicted loss of area.</p> <p>Limited erosion rates in KES 05 mean that the policy of NAI will result in the coastline remaining largely unchanged, although this is dependant on the behaviour of Benacre Ness. HTL at Kessingland Village and Kessingland South may constrain new development of dunes in this area which could potentially lead to deterioration in Ecological Potential. Potential mitigation measures are listed in Assessment Table 5.</p>	✓	✓	✓	
				4.3	Pakefield Cliffs	NAI	NAI	NAI		✓	✓	✓	
				5.1	Benacre Ness	NAI	NAI	NAI		✓	✓	✓	
		5.2	Kessingland Cliff	NAI	NAI	NAI	✓	✓		✓			
		5.3	Kessingland Village	HTL	HTL	HTL	x	✓		✓			
		5.4	Kessingland South	HTL	HTL	HTL	x	✓		✓			
		KES 05	Kessingland										
PDZ2	Benacre Ness to Easton Broad	BEN 06	Kessingland Levels	6.1	Kessingland South	HTL	NAI / MR	NAI / MR	<p>SMP2 policies within this PDZ have the potential to affect Ecological Status or Potential in three coastal water bodies; Suffolk Coast, Benacre Broad and Covehithe Broad. The Suffolk Coast water body runs along the entire frontage of PDZ2 with Benacre Broad and Covehithe Broad Coast water bodies present behind Policy Unit 7.1. Benacre and Covehithe Broad are saline lagoons separated from Suffolk Coast by a shingle ridge.</p> <p>The preferred policy in management area BEN 06 is to HTL in the short term at Kessingland South with a long term view to allow the coast to realign either through NAI or through a more managed realignment process. Allowing the coast to erode back to a more natural profile will increase the width of intertidal habitat in this management area which has the potential to provide benefit to BQE. There will be loss of some brackish and saline lagoon habitats along this section of the coast in the longer-term but this is accepted as loss due to natural change where these habitats have not been defended in the past and where they run to naturally rising ground. Realigning the coast at the Kessingland Levels may result in the loss of saline lagoons (which could naturally migrate landward) and coastal grazing marsh which over time should develop into coastal saltmarsh.</p>	✓	✓	✓	
				6.2	Kessingland Levels	HTL				✓	x	✓	
				6.3	Beach Farm	MR				✓	✓	✓	
		COV 07	Benacre Broad to Easton Broad	7.1	Benacre Broad to Easton Broad	NAI	NAI	NAI		✓	✓	✓	
				7.2	Easton Broad	NAI	NAI	NAI		✓	✓	✓	
												✓	✓

									<p>Some lagoon/brackish habitat may be lost but an equivalent amount of intertidal habitat should be gained and hence deterioration in Ecological Potential is unlikely for Suffolk Coast water body.</p> <p>In Policy Unit 6.2 it is proposed that the Benacre pumping station is realigned some 500-750m within Kessingland Valley. This will involve the loss of the equivalent distance of the Lothingland Hundred Freshwater Body (FWB) (GB105035046250). The loss of this stretch of water body thus has the potential to lead to deterioration in surface water Ecological Potential for this water body.</p> <p>The preferred policy in COV 07 is to allow natural erosion of the coast. Over the lifetime of the SMP2 this will result in the loss of Benacre Broad and Covehithe Broad water bodies which will become effectively part of the Suffolk Coast water body as the shingle ridge gradually erodes and overtops. It is likely that over time the lagoons will be replaced by saltmarsh. Saline lagoons at Easton Bavents will likely migrate up the valley, albeit at the expense of freshwater reedbed habitat. Benacre and Covehithe Broad Coast will be lost as a result of natural change therefore this does not constitute a failure to meet the Environmental Objectives.</p>			
PDZ3	Easton Broad to Dunwich Cliffs	SWD08	Southwold and Southwold North	8.1	Easton Bavents	MR	MR	MR	<p>SMP2 policies within this PDZ have the potential to affect Ecological Potential in two water bodies; Suffolk Coast and Blyth (S) Transitional. The Suffolk Coast water body runs along the entire frontage of PDZ3 with Blyth (S) transitional discharging at Policy Unit 9.2.</p> <p>The SWD08 management area preferred policy promotes a natural movement of coastline to the North of Southwold which will maintain the nature of the cliff/slope habitat. Although the policy is MR which implies some form of active intervention the intention here is to allow the coast to realign naturally with some form of localised management in the future.</p> <p>MR at Easton Bavents and Easton Marsh in the second epoch may lead to the migration of saline lagoons landward but would create a more natural sustainable area of coast. Saltmarsh habitat may also develop here.</p>	✓	✓	✓
				8.2	Easton Marsh	HTL	MR	HTL		✓	✓	✓
				8.3	Southwold Town	HTL	HTL	HTL		✓	✓	✓
		BLY 09	The Denes to Walberswick including the Mouth of the Estuary	9.1	The Denes	HTL	HTL	HTL		✓	✓	✓
				9.2	Harbour Entrance (north and south)	HTL	HTL	HTL		✓	✓	✓

				9.3	Harbour Reach north	HTL	HTL	HTL	<p>HTL is the preferred policy at Southwold Town which aims to retain sediment along the foreshore through the existing groyne network.</p> <p>The HTL policy along The Denes seeks to maintain the integrity of the beach and dune defences resulting in no predicted loss of habitat along this frontage. Similarly MR along Walberswick Dunes will allow the dunes to roll back naturally. HTL within the Harbour may result in the loss of habitat through coastal squeeze but realigning in the south should mean that there is no deterioration in the Ecological Potential at the overall water body scale.</p> <p>MR in the Lower Inner Estuary promotes a natural development of the estuary. Whilst this will lead to the loss of freshwater habitat it will also prevent the loss of intertidal habitat through coastal squeeze. It must be noted that the affected freshwater habitat lies behind the coastal defence and does not form part of the coastal or transitional water body. Policy 10.2 seeks to HTL landward of existing intertidal areas to preserve the A12. It is considered that this policy would lead to the loss of intertidal habitat through coastal squeeze but MR and NAI under Policy 10.1 and 10.3 is likely to create more habitat than that which will be lost at 10.2.</p> <p>The intent for Management area DUN 11 is allow the natural shingle ridge to overtop and to roll inland in response to sea level change. Therefore along much of this frontage the extent of shingle habitat should be maintained including any angiosperms associated with it. The intent of the plan is also to improve flood defences to Walberswick (11.1) and Dunwich (11.3) behind the front line of the shingle bank. The shingle bank will still serve as the primary defence with secondary defences used to ensure flood protection to Walberswick and Dunwich villages. As the defences are set back some distance from the shingle ridge it is unlikely that BQE within these policy units will be affected given the preferred policies for the frontage within this management area.</p> <p>There are two licensed groundwater abstractions known as Alder</p>	✓	✓	✓
				9.4	Harbour reach and mouth, south wide	HTL	MR	MR		✓	✓	✓
				9.5	Walberswick dunes	MR	MR	MR		✓	✓	✓
	BLY 10	Blyth Inner Estuary		10.1	Lower Inner Estuary	MR	MR	MR		✓	✓	✗
				10.2	A12	HTL	HTL	HTL		✓	✓	✓
				10.3	Upper Estuary	NAI	NAI	NAI		✓	✓	✓
	DUN 11	Walberswick Marshes and Dunwich		11.1	Walberswick	HTL	HTL	HTL		✓	✓	✓
				11.2	Walberswick Marshes	MR	MR	MR		✓	✓	✓
				11.3	Dunwich defences	HTL	HTL	HTL		✓	✓	✓
				11.4	Dunwich Cliff	MR	MR	MR		✓	✓	✓

									Carr and Quay Lane located north of Reydon Marshes. Both abstractions are wells at shallow depth (i.e. less than 10 m in depth) and abstract from the Crag aquifer. The abstractions are described by the EA as yielding relatively low quantities of groundwater, albeit, the potential remains for the abstractions to be impacted by the policies proposed in the SMP2. As the policy for PU 10.1 is managed realignment, there is the risk that the saltwater – freshwater interface may move landwards in this area, resulting in the potential for saline intrusion to impact the abstraction. However it is considered unlikely that the Alder Carr and Quay Lane abstractions will be impacted by the MR, due to the low yields observed in the Crag aquifer.			
PDZ4	Dunwich Cliffs to Thorpeness	MIN 12	Dunwich to Minsmere	12.1	Dunwich and Minsmere Cliffs	NAI	NAI	NAI	SMP2 policies within this PDZ have the potential to affect Ecological Potential in two coastal water bodies; Suffolk Coast and Walberswick Marshes. The Suffolk Coast water body runs along the entire frontage of PDZ4 with Walberswick Marshes present behind Policy Units 12.2- 12.4	✓	✓	✓
				12.2	Minsmere North	MR	MR	NAI	The long term management aim for PDZ4 is for the natural development of the coastline with localised defences. Under This NAI and MR approach there is likely to be a gradual shift from Coastal Floodplain/Grazing Marsh to Saltmarsh (via control of Minsmere sluice). The shingle and saline lagoon habitat will gradually migrate landward so the overall provision of habitat should remain constant.	✓	✓	✓
				12.3	Minsmere Central	MR	MR	MR		✓	x	✓
				12.4	Minsmere South	MR	MR	MR		✓	x	✓
				12.2*	Minsmere North (Walberswick Marshes water body)	MR	MR	NAI	Although the preferred policy at Sizewell in Policy Unit 13.1 is to HTL the preferred policies adopted in the adjacent policy units should allow the coastline to provide for more intertidal habitat in Suffolk Coast water body given that the water body is approximately 175 km ² in extent.	✓	✓	✓
				12.3*	Minsmere Central (Walberswick Marshes water body)	MR	MR	MR	It is expected that the overall integrity of Walberswick Marshes water body will be maintained as the shingle and coastal lagoon habitat migrates landward, therefore overall deterioration in surface water Ecological Potential is considered unlikely as a result of SMP2 policy in this water body.	✓	✓	✓
				12.4*	Minsmere South	MR	MR	MR	Although the preferred policy for 12.3 is MR, the sluice present here will in effect be managed as HTL. The sluice drains Leiston Beck FWB (GB105035046270). Over time the FWB will likely	✓	✓	✓

					(Walberswick Marshes water body)				experience saline inundation as the shingle ridge north and south of the sluice roll back. The FWB may also experience more flood events as the tidal limit increases and the sluice is unable to discharge water to the coast. Leiston Beck FWB also runs parallel to the shoreline along the frontage of 12.4. Overtime as this section of coast realigns and the shingle ridge rolls back Leiston Beck will also likely experience greater saline inundations. With these impacts combined it is therefore likely that freshwater BQE may be affected by the preferred policy which could lead to deterioration in Ecological Potential for this water body.				
		MIN 13	Sizewell to Thorpeness	13.1	Power station and village	HTL	HTL	HTL		✓	✓	✓	
				13.2	Sizewell Cliffs	NAI	NAI	NAI		✓	✓	✓	
				13.3	Thorpeness	NAI	NAI	MR		✓	✓	✓	
PDZ5	Thorpeness to Orford Ness	ALB 14	Thorpeness Haven to Aldeburgh	14.1	Thorpeness Haven property	NAI	NAI	NAI	SMP2 policies within this PDZ have the potential to affect Ecological Potential in two water bodies; Suffolk Coast and Alde and Ore Transitional. The Suffolk Coast water body runs along the entire frontage of PDZ5. The complex Alde and Ore water body runs parallel to the coast behind a large shingle ridge (Orfordness) and is potentially affected by Policy Units which front this section of coastline. Defence policies within the estuary itself are subject to a separate strategy.	✓	✓	✓	
				14.2	Thorpeness Haven Beach	MR	MR	MR		✓	x	✓	
				14.3	Aldeburgh	HTL	HTL	HTL		✓	✓	✓	
				14.4	Slaughden North	HTL	HTL	HTL		✓	✓	✓	
		ORF 15	Martello Tower to Orford Ness	15.1	Sudbourne Beach	HTL	NAI	NAI	Management area ALB 14 provides for the natural evolution of the coast to the north, whilst holding the line at Aldeburgh and Slaughden in order to maintain the integrity of the estuary to the rear. Policy unit 14.4 has the potential to affect both water bodies given that the Alde and Ore runs behind it. MR would lead to roll back of habitat which should allow the area of intertidal habitat to be maintained despite localised losses where HTL is the preferred policy. In regard to policies that may affect the Alde & Ore water body the preferred policies seek to work with natural processes and the integrity of the Alde & Ore water body will be maintained. There will be some shingle roll back at Orford (policy unit 15.2) but the main Alde channel will not be change as a result of SMP2 policies along this frontage. The Environment Agency water body information shows the Hundred River FWB (GB105035046260) discharges through a sluice along policy unit 14.2. It has been presumed that the river must discharge through a culvert which runs underneath Thorpe	✓	✓	✓	
				15.2	Orford Ness	NAI	NAI	NAI		✓	✓	✓	
				15.1*	Sudbourne Beach (Alde and Ore water body)	HTL	NAI	NAI		✓	✓	✓	
				15.2*	Orford Ness (Alde and Ore water body)	NAI	NAI	NAI		✓	✓	✓	

									<p>Road. The preferred policy of MR will lead to shingle roll back and increased saline inundation of the FWB which may compromise its ability to support freshwater BQE.</p> <p>The preferred policies in Management Area ORF 15 promote natural development of the coast. It is anticipated that the shingle ridge will roll back landward at a slow rate which may lead to the eventual loss of saline lagoons. As this is a natural process, it does not constitute a failure to meet Environmental Objectives.</p>			
PDZ6	Orford Ness to Cobbolds Point	HOL 16	Orford Ness to Bawdsey Hill	16.1	Orford Beach	NAI	NAI	NAI	<p>SMP2 policies within this PDZ have the potential to affect Ecological Potential in three water bodies; Suffolk Coast, Alde and Ore Transitional and Deben Transitional.</p> <p>The preferred policies for Management Area HOL 16 promote the natural roll back of the shingle ridge at a rate that will be controlled by the HTL policy at East Lane. Whilst there maybe some transition and exchange between habitat types the overall effect will be to provide a relatively stable provision of habitat suitable to support BQE within Suffolk Coast water body.</p> <p>The preferred policies for Management Area DEB 17 are to respond to sea level rise in a manner which will enable the Deben estuary to function naturally, albeit within the confines of HTL at the mouth of the estuary. HTL in the first two epochs in the lower estuary may result in the loss of intertidal habitat through SLR. Although MR is proposed in the third epoch it is likely that some intertidal habitat will be lost in the interim and, hence, there is potential for deterioration in surface water Ecological Potential for the Deben Transitional water body.</p> <p>The preferred policy at Bawdsey Manor (17.2) is to HTL. HTL here is seen as essential to control the shape of the estuary. Major failure of this control system could lead to a disruption in the Knolls system with subsequent loss of habitat within the estuary as the estuary reconfigures. However, as a result there is potential for impacts on Deben water body. In relation to the Suffolk Coast water body HTL policy at Bawdsey Manor should ensure that intertidal foreshore is retained.</p>	✓	✓	✓
				16.2	North Weir Point	MR	MR	NAI		✓	✓	✓
				16.3	Shingle Street	MR	HTL	HTL		✓	✓	✓
				16.4	Hollesley Bay	MR	MR	MR		✓	✓	✓
				16.5	East Lane	HTL	HTL	HTL		✓	✓	✓
				16.6	Bawdsey Hill	NAI	NAI	NAI		✓	✓	✓
				16.1*	Orford Beach (Alde and Ore water body)	NAI	NAI	NAI		✓	✓	✓
				16.2*	North Weir Point (Alde and Ore water body)	MR	MR	NAI		✓	✓	✓
		DEB 17	Bawdsey Hill to Mouth of Deben	17.1	Bawdsey Cliffs	NAI	NAI	NAI		✓	✓	✓
				17.2	Bawdsey Manor	HTL	HTL	HTL		✓	✓	✓
17.3	Lower			HTL	HTL	MR	✓	✓	✓			

					Estuary				HTL in Management Area DEB 18 seeks to retain shingle habitat between the groynes along North Felixstowe. If NAI was adopted it is likely that the groynes would fail overtime and shingle habitat would erode away. Therefore HTL is unlikely to compromise the environmental objectives along this frontage.			
				17.4	Felixstowe Ferry	HTL	HTL	HTL		✓	✓	✓
				17.3*	Lower Estuary (Deben Transitional)	HTL	HTL	MR		x	✓	✓
				17.4*	Felixstowe Ferry (Deben Transitional)	HTL	HTL	HTL		x	✓	✓
				18.1	Golf Course	HTL	HTL	HTL		✓	✓	✓
		DEB 18	North Felixstowe	18.2	North Felixstowe	HTL	HTL	HTL	✓	✓	✓	
PDZ7	Cobbold's Point to Felixstowe Port (South)	FEL 19	Cobbold's Point to Languard Point	19.1	Cobbold's Point	HTL	HTL	HTL	With the exception of FEL 19.4 the preferred policy along this frontage is to HTL. The coastline here is greatly influenced by the presence of the fishtail groynes at Cobbolds Point and the defences at Languard Point. By maintaining these defences shingle habitat is retained along much of this frontage. Erosion rates along Languard Common (19.4) are minimised through the maintained defences north and south. Here a policy of MR is preferred which may mean that the shingle ridge will roll back with sea level rise. However it is expected that any shift in habitat will be minor or transitional.	✓	✓	✓
				19.2	Felixstowe Beach	HTL	HTL	HTL		✓	✓	✓
				19.3	South Felixstowe	HTL	HTL	HTL		✓	✓	✓
				19.4	Landguard Common	MR	MR	MR		✓	✓	✓
				19.5	Landguard Point	HTL	HTL	HTL		✓	✓	✓
		FEL 20	Languard Point to Felixstowe Port (South)	20.1	Languard Fort	HTL	HTL	HTL	Therefore angiosperms associated with shingle habitat will be maintained in both coastal water bodies and the preferred policies should not lead to a deterioration in Ecological Potential.	✓	✓	✓

* denotes where policies overlap for the same water body

3.3.1 Environmental Objective WFD1

WFD1 is only applicable to High Status water bodies. There are no High Status water bodies in the Suffolk SMP2 area. However Benacre Broad and Covehithe Broad Coast water bodies have not been assigned a Hydromorphological Designation so in theory they could be designated High Status. However as these water bodies will only be affected by NAI policies it is considered that this Environmental Objective will be met.

3.3.2 Environmental Objective WFD2

As **Assessment Table 3** shows there is potential for some of the Policy Units 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). Where it was shown that a preferred policy would result in a net loss of habitat that could not be replaced by another policy in the same water body either through Managed Realignment or No Active Intervention then deterioration in status or potential is likely. However if in the same water body a HTL policy results in the *loss* of intertidal habitat but a policy of MR or NAI along a different stretch of that water body results in an *increase* in habitat, i.e. there is no net loss of intertidal habitat within the water body, then the overall ecological functioning of the system should be maintained and this would not be expected to result in a deterioration in status or potential.

3.3.3 Environmental Objective WFD3

MR policies have the potential to result in the deterioration in Ecological Potential for three Freshwater Bodies (FWB) within the Suffolk SMP2. These FWB are:

- Lothingland Hundred Freshwater Body (FWB) (GB105035046250);
- Leiston Beck FWB (GB105035046270); and
- Hundred River FWB (GB105035046260).

However it is understood that these water bodies presently experience periods of saline inundation and their status as FWB may be questioned. Further investigation as to the status of these FWB is therefore required.

3.3.4 Environmental Objective WFD4

As per the Guidance for Assessment of SMPs under WFD, the policy which has the potential to cause deterioration in groundwater status is Managed Realignment (MR). If landwards, MR has the potential to result in the saltwater – freshwater interface moving landwards, which coupled with abstraction pressures, could result in saltwater intrusion and status deterioration of the GWB. An assessment of the impact to groundwater status can be made on the basis that coastal erosion may occur if they are introduced.

In order to assess the impact to groundwater status, the locations of groundwater abstractions with Source Protection Zones (SPZs) within the three 'At Risk' GWBs (See Section 3.1.3) were obtained from the Environment Agency's website (<http://maps.environment-agency.gov.uk/wiyby>). The EA website indicated that there are two abstractions, known as Alder Carr and Quay Lane located north of Reydon Marshes at National Grid References (NGR) TM 4800 7718 and TM 4856 7740, respectively. Both abstractions are wells at shallow depth (i.e. less than 10 m in depth) and abstract from the Crag aquifer. The abstractions are described by the EA as

yielding relatively low yields, albeit, the potential remains for the abstractions to be impacted by the policies proposed in the SMP2.

This potential for impact to these two abstractions has been determined on the basis that the total catchment of the abstraction, i.e. Zone 3 of the SPZ extends to the Blyth estuary within management area BLY10.1. As the policy for this management area is managed realignment, there is the risk that the saltwater – freshwater interface may move landwards in this area, resulting in the potential for saline intrusion to impact the abstraction. However, the EA has provided chloride concentrations for a groundwater quality monitoring borehole located within the Crag aquifer approximately 2 km of Alder Carr and Quay Lane abstractions at NGR TM 4735 7793. The chloride concentrations observed in groundwater abstracted from the monitoring borehole range from 65 mg/l to 84.9 mg/l indicating that there is no current impact from saline intrusion in this aquifer.

It is considered unlikely that the Alder Carr and Quay Lane abstractions will be impacted by the managed realignment, due to the low yields observed in the Crag aquifer. However, in order to fully assess the potential impact from this managed realignment, it is recommended that a groundwater model (both conceptual and numerical) be used to predict the impact to the saline water interface as a result of the SMP2 policies in management area 10.1.

3.3.5 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 two water bodies. These Water Framework Directive Summary Statements can be found in **Assessment Tables 5a and 5b**.

Assessment Table 4: Summary of achievement of WFD Environmental Objectives for each water body in the Suffolk SMP2 area (colour shading corresponds to the shaded water bodies in **Figures 3.1 to 3.8**)

Water body	Environmental Objectives met?				WFD Summary Statement required?
	WFD1	WFD2	WFD3	WFD4	
Suffolk Coast	N/A	x	x	✓	Yes – Environmental Objectives WFD2 and WFD3 may not be met in some Policy Units in this water body under SMP2 policies.
Benacre Broad	N/A	✓	✓	✓	No – not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policies
Covehithe Broad	N/A	✓	✓	✓	No – not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policies
Walberswick Marshes	N/A	✓	✓	✓	No – not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policies
Essex Coast	N/A	✓	✓	✓	No – not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policies

Harwich Approaches	N/A	✓	✓	✓	No – not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policies
Bure & Waveney etc.	N/A	✓	✓	✓	No – not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policies
Blyth (S)	N/A	✓	✓	✓	No – not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policies
Alde & Ore	N/A	✓	✓	✓	No – not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policies
Deben	N/A	x	✓	✓	Yes – Environmental Objective WFD2, may not be met in some Policy Units in this water body under SMP2 policies.

Assessment Table 5a: Suffolk Coast Water body

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation within the SMP2
Suffolk Coast	Provide a summary of the policies which may cause this water body to fail one or more objectives.	The preferred SMP2 policies that may lead to deterioration in Ecological Potential for the Suffolk Coastal water body include Management Area MA KES 05 where the preferred policies may impact upon BQE present at Kessingland. The preferred defence policy of HTL for Policy Units 5.3 and 5.4 may constrain the development of sand dunes along this frontage thereby affecting angiosperms detailed in Assessment Table 1.
	Have all practicable mitigation measures been incorporated into the preferred SMP2 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>Mitigation measures incorporated in SMP2 policies:</p> <ul style="list-style-type: none"> • Local management to encourage dune development elsewhere in the water body; and • Coastal monitoring of the dunes.
	Can it be shown that the reasons for selecting the preferred SMP2 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 SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	HTL policy is required to protect the village of Kessingland from tidal flooding. The benefits to the environment and to society of achieving the Environmental Objectives are outweighed by the benefits of the preferred SMP2 policies to human health.
	Have other significantly better options for the SMP2 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>In line with SMP guidance various options were considered during the development of SMP2 policy. The HTL policy at Policy Units 5.3 and 5.4 is to prevent flooding to Kessingland Village is considered to be the only viable policy at this site without comprising the health and safety of the inhabitants of the village.</p> <p>See the 'Policy Statements' for each policy unit set out in the SMP2 report for further cost/benefit analysis.</p>
	Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the	The Environment Agency Flood Map application and groundwater maps have been consulted to check for landward freshwater and groundwater bodies that could be

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation within the SMP2
	<p>objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?</p>	<p>impacted by the SMP2 policies. These are:</p> <p>Freshwater</p> <p>The policy at Kessingland Levels (Policy 6.2) has the potential to result in the loss of between 500- 750 metres length of Lothingland Hundred FWB. The preferred policy aims to realign this frontage by moving Benacre Pumping Station in land to allow the coast to develop in a more natural sustainable fashion. If the pumping station was left in its present location it could, over time, become a promontory affecting coastal processes to the north and south. If the pumping station was left to fail the coastline under a NAI scenario would eventually erode back until the FWB would effectively become part of the Suffolk Coastal water body and become tidal in nature. Therefore by maintaining the pump station and relocating it in land it is effectively preventing the FWB from saline inundation. The issue therefore is the potential loss of a 500 -750 metre stretch of this water body through erosion. The preferred policy here could therefore compromise this water body achieving the objectives of the Directive.</p> <p>The policy at Minsmere Central (Policy Unit 12.3) may affect BQE's in Leiston Beck FWB. Although the sluice will be managed as HTL the preferred policies north and south will allow the coastline to erode back to a more natural profile and thus exposing the FWB to a greater degree of tidal flooding. In addition the FWB also runs parallel to the shoreline along the frontage of 12.4 where the preferred policy is MR, again exposing it to an increased risk of tidal inundation. The preferred policies have been selected to allow the coastline to develop a more sustainable profile but could comprise the water body to achieve the objectives of the Directive.</p> <p>The preferred policy at Thorpeness Haven Beach (Policy Unit 14.2) is MR and will likely result in the coastline eroding back and exposing Hundred River FWB to increased risk of tidal inundation and therefore its ability to meet the objectives of the Directive.</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation within the SMP2
		<p>Groundwater</p> <p>There is the potential for any SMP2 policy of NAI or MR to impact on the groundwater body for this area and the monitoring and mitigation outlined above will help to appraise this potential issue and inform the SMP2 policy process in order to develop mitigation strategies for all three epochs.</p>
	<p>Can it be shown that there are no other over-riding issues that should be considered (e.g. designated sites, recommendations of the Appropriate Assessment)?</p>	<p>Designated sites</p> <p>This water body has a number of designated sites of national and international significance including: Benacre to Easton Bavents SPA; Pakefield to Easton Bavents SSSI; Minsmere-Walberswick Heaths & Marshes SSSI; Minsmere-Walberswick Heaths & Marshes SAC; Minsmere-Walberswick SPA; Sizewell Marshes SSSI; Leiston – Aldeburgh SSSI; Sandlings SPA; Alde-Ore Estuary SSSI; Alde-Ore & Butley Estuary SAC; Alde-Ore Estuary SPA; Bawdsey Cliff SSSI; Deben Estuary SSSI and Deben Estuary SPA. None of these are at risk as a result of the mitigation measures proposed above.</p> <p>BAP habitat</p> <p>The water body also contains a number of UKBAP habitat types.</p> <p>The intent of the SMP2 policy is to allow the coastline to develop naturally, whilst defending the integrity of settlements and key infrastructure (e.g. A12).</p> <p>The conclusions of the AA and SEA state that where habitat are lost under a NAI or MR policy the provision of BAP habitat should remain the same as habitats are replaced with new habitats under a different physical regime.</p> <p>As such, there are no other over-riding issues that need to be considered.</p>

Assessment Table 5b: Deben Transitional water body

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation within the SMP2
<p>Deben Transitional</p>	<p>Provide a summary of the policies which may cause this water body to fail one or more objectives.</p>	<p>The preferred SMP2 policies that may lead to deterioration in Ecological Potential for the Deben Transitional water body include MA DEB 17 where the preferred policy of HTL for Policy Units 17.3 and 17.4 may impact upon benthic invertebrates and macroalgae through the loss of intertidal mudflat habitat through sea level rise and coastal squeeze.</p>
	<p>Have all practicable mitigation measures been incorporated into the preferred SMP2 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 in SMP2 policies:</p> <ul style="list-style-type: none"> • Investigate the potential to create new intertidal habitat by opening up areas within the water body. There maybe areas further up the estuary which could be used as mitigation for the loss of intertidal habitat in and around the mouth of the Deben; and • Monitoring of intertidal mudflat extent, to inform appropriate project level mitigation.
	<p>Can it be shown that the reasons for selecting the preferred SMP2 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</p>	<p>The HTL policy for Felixstowe Ferry frontage is seen as being an essential component for management of the whole area. Local management of the increasing flood risk to the part of the village seaward of the main defences would need to be considered in specific detail, with regard to anticipated sea level rise. However given this frontages</p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation within the SMP2
	benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	importance to the protection of commercial and residential properties it can be concluded that the benefits to the environment and to society of achieving the Environmental Objectives are outweighed by the benefits of the preferred SMP2 policies to the maintenance of health and safety and to sustainable development.
	Have other significantly better options for the SMP2 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>In line with SMP guidance various options were considered during the development of SMP2 policy. The justification for the preferred policy is provided in the Policy Statements for each unit set out in the SMP2. This also incorporates the findings of the AA and SEA.</p> <p>The preferred option allows the control features at the mouth of the estuary to be retained which influences morphological development elsewhere in the estuary. The preferred policy in these two units is therefore required for the overall management of the water body.</p>
	Can it be demonstrated that the preferred SMP2 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>Groundwater</p> <p>There is the potential for any SMP2 policy of NAI or MR to impact on the groundwater body for this area. It is recommended that should MR be taken forward within the third epoch that a groundwater model is developed to better appraise this potential issue and inform the future SMP policy process. This will enable specific mitigation strategies to be developed.</p>
	Can it be shown that there are no other over-riding issues that should be considered (e.g. designated sites, recommendations of the Appropriate Assessment)?	<p>The Deben Estuary SPA and Ramsar extend into this water body. The conclusions of the Appropriate Assessment state the following:</p> <p><i>It is likely that holding the line in the estuary over Epoch 1 and 2 may lead to a loss of intertidal habitat and subsequent requirements for realignment. The overall intent of this management area is to respond to sea level rise in a manner which will enable the estuary to function naturally, albeit within the confines of human activity at the estuary mouth. However, until the strategy for the estuary has been developed, it is difficult to determine whether there will be an adverse effect on the SPA as the</i></p>

Water body	WFD Summary Statement checklist	A brief description of decision making and reference to further documentation within the SMP2
		<p><i>estuary strategy may give rise to a managed realignment policy which would serve to mitigate any losses due to holding the estuary mouth.</i></p> <p>The AA concluded by stating the following:</p> <p><i>The HTL policy in the estuary under 17.3 may lead to a loss of intertidal habitat that would have an adverse effect on designated bird species. This policy may therefore have an adverse effect on the integrity of the site.</i></p> <p><i>Completion of the estuary strategy could lead to an avoidance of an adverse effect on the integrity of the site.</i></p>

4 DISCUSSION AND CONCLUSIONS

It is the overall intention of the Suffolk SMP2 to allow the coastline to function and behave in a more natural sustainable way. Therefore, where possible, SMP policies of NAI and MR have been adopted to allow the coastline to adapt to the prevailing coastal processes that are experienced along this stretch of coastline in order to reach equilibrium. HTL SMP polices aim to protect key residential and commercial areas from flooding with associated benefits to the economy and public safety. HTL policies have also been selected in Policy Units which are key control points that influence the development of the coast. Therefore when considering whether SMP policies have the potential to result in deterioration in ecological potential this assessment has taken into consideration the overall impact of the preferred polices on the functioning of the relevant water body and its ability to support BQE as indentified in **Assessment Table 1**.

For most of the PDZ's, it is considered unlikely that the policies within the Suffolk SMP2 will affect the current or target Ecological Status or Potential of water bodies and, hence, the policies meet the Environmental Objectives. However, there are some PDZ's where the SMP2 policies have the potential to contribute to failure of Environmental Objectives (as identified by 'x' under the 'Environmental Objectives met?' column in **Assessment Table 3**). A Water Framework Directive Summary Statement has been completed for those water bodies where there is potential for failure. The Summary Statement outlines the reasons behind selecting the preferred SMP2 policy and any mitigation measures that have been incorporated into the policies.

There are no High Status water bodies present in the Suffolk SMP2 area. Therefore the SMP is in compliance with Environmental Objective WFD1 (no changes affecting high status sites).

The potential of the SMP2 not to meet Environmental Objective 2 is applicable to two water bodies; Suffolk Coastal and Deben Transitional. The adoption of the preferred SMP policy for Policy Units 5.3 and 5.4 may constrain the development of sand dunes in Suffolk Coastal thereby affecting BQE such as angiosperms. As shown in **Assessment Table 5** the SMP policy has been adopted to protect the village of Kessingland from flooding and is therefore justified under overriding public interest. Therefore any potential deterioration in ecological potential can be defended under Article 4.7. However providing that local management within the water body promotes or encourages dune development then the overall dune resource should not diminish and ecological potential should not deteriorate.

Similarly it has been identified that preferred SMP polices have the potential to result in a deterioration in ecological potential for the Deben transitional water body. The HTL policy at 17.3 and 17.4 is seen as being an essential component for management of the whole area and is considered to be in the over riding interest of the public and can be defended under Article 4.7. However the Deben Strategy will build upon the work of the Suffolk SMP2 and will be cognisant of it findings and recommendations. Therefore the potential to realign in the middle and upper reaches of this transitional water body (as identified in the Suffolk SMP2) should be considered to ensure there is not deterioration in ecological potential as a result of the strategy.

There is potential for the SMP to not meet Environmental Objective 3 for three FWB. These are:

- Lothingland Hundred;
- Leiston Beck; and
- Hundred River.

These water bodies have the potential to be affected by a MR policy due to direct loss through coastal erosion and increased risk of saline inundation by overtopping. However it is understood that these FWB already experience periodic saline inundations and their status as FWB should be reviewed. Also it is likely that these FWB were previously hydrologically linked to the coastal water bodies which they discharge into. Therefore it could be argued that the preferred policy is restoring the water bodies to their previous function. The impact of the preferred defence policies on these water bodies should be considered in more detail at a Strategy level.

It was also determined that MR policies are not likely to affect the status of GWB that are present in the SMP area. Therefore the SMP is compliant with Environmental Objective 4.

In addition, it is recommended that, for the next round of SMPs, the boundary between LOW01 and the Suffolk Coast water body could be adjusted so that they are aligned. There could be potential for the movement of the Suffolk Coast water body boundary southwards so that it ends where the Suffolk SMP2 begins, thus moving the Norfolk East Coast water body boundary southwards as well. The Suffolk SMP2 and the Suffolk Coast water body would then begin at the same point. Initial examination of the potential for this would suggest that such a move would correspond with both coastal processes and coastal geomorphology in this area. Further investigation is recommended.

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