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Anglian Water Services Limited  
Water Resources Management Plan

Strategic Environmental Assessment  
Environmental Report: Non-Technical Summary

April 2008





### Introduction

This report summarises the findings of the Environmental Report prepared for the Strategic Environmental Assessment (SEA) of Anglian Water Services Limited’s (Anglian Water) Draft Water Resource Management Plan.

### Background

All water companies are required to prepare a Water Resource Management Plan (WRMP) to set out how they intend to deliver water supplies to their catchment over a period of 25 years. The WRMP sets out the strategy for maintaining a secure supply-demand balance through a combination of demand management measures and water resource development. New WRMPs are prepared every 5 years, known as Asset Management Planning (AMP) periods, and reviewed annually through the June Return Process through the production of a stand alone report and tables that are submitted to Ofwat (Water Services Regulation Authority).

An SEA has been carried out on the new Draft WRMP, currently the subject of a public consultation, which will cover the planning period 2010–2035. The Environment Report is the output of that SEA. The Draft WRMP sets out the options for managing demand and supplying additional water to the region. These have been chosen from a long list of feasible options that included, reservoir schemes, wastewater reuse, aquifer recharge and raw and treated water transfers as well as leakage reduction, metering and water efficiency measures.

The SEA has formed part of the decision-making process that will enable Anglian Water to meet its statutory objectives. The SEA process is integrated into the WRMP process allowing environmental issues to be considered at an early stage of plan development.

### Anglian Water Services

Geographically, Anglian Water is the largest water and wastewater company in England and Wales, covering some 27,000km<sup>2</sup>. It has just over 5 million customers from the Humber estuary to the Thames estuary and from Northamptonshire to the east coast of England plus a small area around Hartlepool in the northeast of England.

The Anglian Water region is shown in Figure 1. Its water supply area is split in to 12 Water Resource Zones (WRZs) for the purposes of water resource planning. These WRZs are split into smaller Planning Zones (PZs) to enable detailed

analysis of the balance between water supplies and demand. These WRZs and PZs are shown in Figure 2.

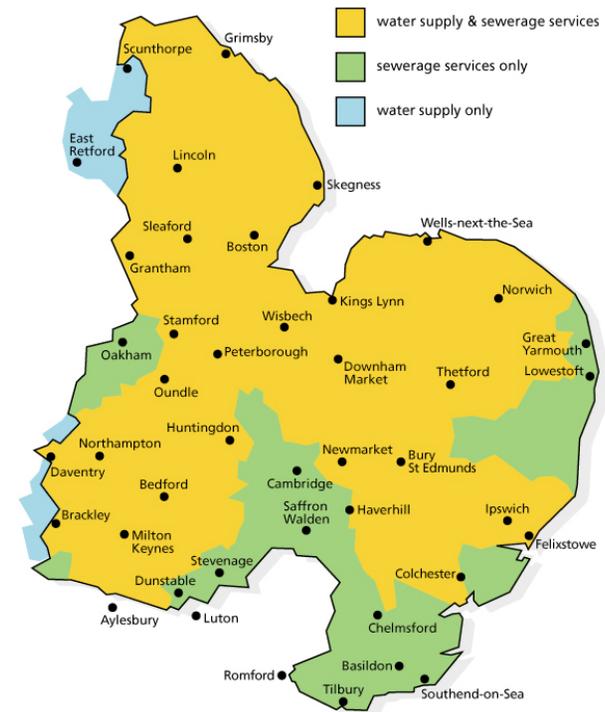


Figure 1 The Anglian Water Services region

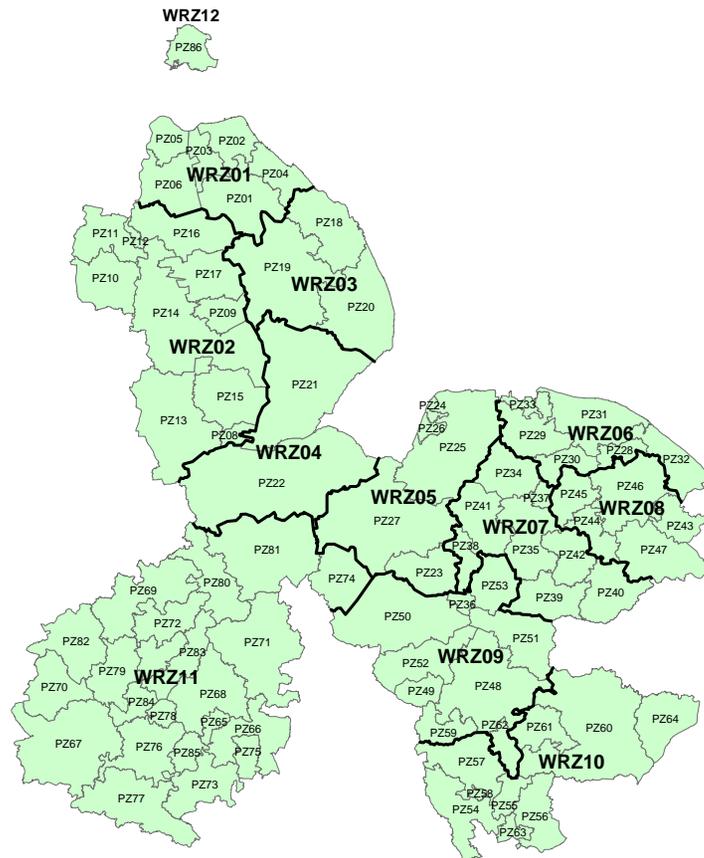


Figure 2 Water resource zones and planning zones

### Requirement for Strategic Environmental Assessment

European Directive 2001/42/EC ‘on the assessment of effects of certain plans and programmes on the environment’ (the SEA Directive), was transposed into English Law via the Environment Assessment of Plans and Programmes Regulations 2004, Statutory Instrument 2004 No.1633, (the SEA Regulations).

The SEA Directive applies to a wide range of plans and programmes and the overarching aim is to “provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development” (Article 1).

The SEA Directive defines ‘environmental assessment’ (Article 2(b)) as a procedure comprising:

- preparing an Environmental Report on the likely significant effects of the draft plan or programme and reasonable alternatives;
- carrying out consultation on the draft plan or programme and the accompanying Environmental Report;
- taking into account the Environmental Report and the results of consultation in decision making; and
- providing information when the plan or programme is adopted and showing how the results of the environmental assessment have been taken into account.

A screening assessment was carried out in early 2007 which determined that an SEA was required as part of the WRMP process. The report was sent to the Environment Agency, Natural England and English Heritage in order to determine their views as statutory consultees. All three statutory consultees confirmed that an SEA would be required for Anglian Water’s WRMP.

The requirement for SEA was determined on the basis that the WRMP falls within the scope of Article 3.2(a) of the SEA Directive, which provides that an environmental assessment shall be carried out for any plan or programme where:

- a) it is prepared for, *inter alia*, water management; and
- b) sets the framework for future development consent of projects listed in Annex I and II to Directive 85/337/EEC (the EIA Directive, as amended by Council Directive 97/11/EC) and additionally under Article 2(a) of the SEA Directive.

Anglian Water is considered to be an 'authority' preparing a plan (the WRMP) for adoption through a legislative provision, in this case under the Water Act 2003 amending the Water Industry Act 1991.

### Level of Detail

The scale of the WRMP and the wide geographic area which it covers has meant the nature of the assessment undertaken for the SEA is of a high level, utilising information generally available at a regional level. This accords with the aspiration of the SEA Directive when it states in Article 5 that the geographic scope of the plan should be taken into consideration when evaluating the environmental effects.

The SEA is a high level assessment aimed at highlighting potential environmental concerns which can be examined in greater detail through further scheme specific study through the undertaking of an Environmental Impact Assessment as part of the planning process required for schemes.

### The SEA Process

There are five main stages to the SEA process:

- Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope
- Stage B: Developing and refining alternatives and assessing effects
- Stage C: Preparing the Environmental Report
- Stage D: Consulting on the Draft WRMP and Environmental Report
- Stage E: Monitoring implementation of the WRMP

### SEA Scoping

Stage A of the process involves scoping the SEA. The baseline information collected at this stage was readily available from key sources such as the Environment Agency, Natural England, English Heritage, Defra and national and local government. No primary research or data gathering was conducted. This process enabled the existing environmental issues to be identified and provided a reference point from which the potential environmental effects of the WRMP could be assessed.

The output of the scoping study was a report that:

- identified relevant plans, programmes, and environmental protection objectives which influence, or are influenced by, the WRMP;
- described the environmental baseline within the Anglian Water region;

- identified key environmental issues; and
- identified the SEA objectives.

### Other Relevant Policies, Plans and Programmes

The SEA Regulations require consideration of other relevant policies, plans and programmes (PPP) that may influence the choice of water resource schemes included in the Draft WRMP. A detailed review of international, national and regional documents was undertaken in parallel with the collation of environmental baseline information. The list of PPPs reviewed by the SEA is provided in Appendix 1.

### Environmental Baseline

Environmental baseline information was collected to gain an understanding of the current environmental situation in the Anglian Water region. This process enabled the existing environmental issues to be identified and provide a reference point from which to assess the potential environmental effects of the Draft WRMP.

Data has been collated relating to the key SEA topic areas as set out in Annex 1(f) of the SEA Directive. For the purposes of this SEA some of the topics have been combined to make them more relevant to the WRMP, the categories that have been chosen to represent the SEA topics for this assessment are:

- 1) Biodiversity, Flora and Fauna
- 2) Human Beings (incorporating Population and Human Health)
- 3) Land use and development (incorporating Soil)
- 4) Water
- 5) Material Assets
- 6) Cultural Heritage (Archaeology and Architecture)
- 7) Landscape
- 8) Air Quality (incorporating Climate Change)

The environmental baseline for the Anglian Water region is summarised here in relation to the eight topic categories. In describing the environmental baseline this section also identifies the key issues facing the environment within the Anglian Water region.

### *Biodiversity, Flora and Fauna*

#### **Designated Sites**

The Anglian Water region is environmentally diverse and sensitive, containing a range of habitats and species. This is reflected in the many designated sites of national and international importance. This includes up to 819 Sites of Special Scientific Interest (SSSIs) covering some 6.6% of the land area (around 115,700 hectares), 38 Special Areas of Conservation (SAC), 25 Special Protection Areas (SPA), 30 Ramsar sites and many other non-statutory sites. Anglian Water also owns or manages 50 SSSIs including Rutland Water, Tetney Blow Wells, Taverham Mills alongside the River Wensum and Stannet's Creek Lagoon (part of the Crouch and Roach SSSI).

#### **Biodiversity Action Plan**

Anglian Water is committed to making a positive contribution to biodiversity through delivering its 10-year Biodiversity Action Plan (BAP) (1999). The plan has been successful in reintroducing two species to England, the osprey and the pool frog, the latter's habitat had been under pressure from water abstraction and poor water quality.

#### **Catchment Abstraction Management Strategies**

A significant water management issue with implications for biodiversity is water abstraction for public water supply, agriculture and industry. Unsustainable abstraction to supply water can cause ecological impacts in rivers and estuaries by reducing low river flows and levels or in wetlands by lowering the level of groundwater. This is a matter for consideration in the WRMP as the largest demand for water in the Anglian River Basin District comes from public water supply, although there are also a large number of smaller abstractions across the district to supply agriculture and industrial uses.

The Environment Agency's Catchment Abstraction Management Strategies (CAMS) outline the approach to managing water resources in local catchment areas. Through the abstraction licensing regime surface water and groundwater availability is managed in water resource management units, helping to balance the needs of water users and the environment. To fully appreciate the potential effects, the baseline for water related designated sites in the Anglian Water region has been established from a review of the relevant CAMS.

### *Human Beings*

#### **Population and Water Usage**

Population growth in the Anglian Water region has been driven by a rise in inward migration from other regions in the UK and from Eastern Europe. The Anglian Water region's close proximity to London has meant it has become attractive for commuters working in the capital, this has also led to population growth. The regional plans propose an increase of some 50% in the historic rate of house building, much of this focussed in the growth areas, such as Milton Keynes. By 2035 the region's population is expected to grow by some 850,000.

Anglian Water has lobbied for tighter mandatory standards for water efficient designs and specifications in new builds. Domestic customer water usage is a core driver of the Draft WRMP with activities such as metering and water efficiency influencing the demand for water. Over 60% of Anglian Water's customers already have a water meter fitted. In recent years Anglian Water has consistently installed some 20,000 meters into new domestic properties and over 20,000 existing customers opt to move to measured water charges each year.

#### **Recreation**

Sixteen of Anglian Water's operational sites are open to the public for recreational purposes. Thirteen of the sites have public access and of these, 10 operate as nature reserves, 10 as coarse angling centres, 5 accommodate cycling centres, 7 have sailing and windsurfing centres and 5 accommodate canoeing centres. The promotion of recreation and community involvement at their water based sites is important to Anglian Water.

#### *Land Use and Development (incorporating soil)*

The East of England and East Midlands are well known for their agricultural production. Indeed, the East of England alone contains 58% of the UK's grade 1 and 2 agricultural soils, defined as excellent and very good quality land. The Regional Assemblies covering the Anglian Water region have reported in recent years a rising trend in the quantity of land being utilised for wheat, barley and rapeseed production, emphasising the importance of agriculture to the local economy.

The relationship between the WRMP and the high level of agricultural activity is two-fold. The significance of the agricultural land to the economy means that the WRMP should look to locate potential water resource development options in areas which limit the amount of agricultural land take, thus protecting the agricultural

economy of the region. To take the pressure off agricultural land future development should be focussed on existing operational sites.

Furthermore, a large proportion of land in agricultural production means the risk of fertilisers and other agricultural chemicals leaching into water resources is high.

### *Water*

#### **Water Resources**

The East of England is the driest region in the UK, experiencing an average of 600 mm of rainfall annually in contrast to an average of 900 mm for England and Wales. In an average year only a quarter of the rainfall is available as a water resource after evaporation and use by plants. Consequently water availability is a key issue for Anglian Water and the WRMP.

The Environment Agency identified the Anglian Water region as an area of moderate water stress in its 2007 consultation on water stressed areas. This was revised to one of serious water stress in the final designation.

The Anglian Water region's water resources are highly utilised. The predictions for growth in the region means water resources are going to need to be carefully managed to provide additional water supplies and manage customer demand to ensure a secure supply of water without damaging the natural environment.

#### **Water Quality**

The Water Framework Directive will place increasingly stringent targets on water quality. Currently only 46% of river lengths in the Environment Agency's Anglian region are rated 'Good' in terms of chemical water quality as opposed to the average for England as a whole of 64%. In terms of Biological water quality the region fares better with on average 70% of river lengths being classified as 'good' in comparison to a total of 71% for England as a whole.

The diffuse pollution of water is a widespread problem and action to tackle it is required. The single biggest threat of diffuse water pollution is from agriculture. This is unsurprising, as agriculture makes up a large proportion of the land area of the Anglian Water region and the sources of diffuse pollution, including nutrients from fertilisers and manure, are essential parts of farming. Increases in nutrient levels can result in toxic algal blooms, resulting in adverse impacts on the food chain which supports fish, animals and birds.

#### **Flooding**

Flooding is an issue pertinent to the Anglian Water WRMP for two reasons. Firstly, the potential impact of flooding on Anglian Water owned assets, both water and wastewater services infrastructure and secondly, the potential for water resource development options to reduce the quantity of floodplain within the Anglian Water region.

#### **Material Assets**

Anglian Water currently manages a total of some 37,000km of water mains, distributing water from 139 water treatment works located throughout the region. In addition to this the company operates 1,083 wastewater treatment works (WWTWs), the highest concentration of WWTWs per head of population in the country.

The SEA considers the additional infrastructure which might be added to the Anglian Water assets through the identification of new resource development options. In terms of environmental effects of the additional infrastructure the SEA evaluates these in terms of energy use, biodiversity, landscape and cultural heritage rather than a specific material assets indicator.

#### **Cultural Heritage**

The Anglian Water region contains a wealth of archaeology and cultural heritage, in particular, a significant number of Grade I and II listed buildings. Anglian Water currently owns and manages 6 listed buildings.

The SEA acknowledges that not all archaeological features have already been identified within the Anglian Water region. The archaeological potential of the area needs to be considered when evaluating any proposed options at the scheme / EIA level assessment. With this in mind, the SEA aims to give an indication of the sensitivity of the region to archaeological impact based on existing evidence.

#### **Landscape**

The Anglian Water region has a diverse and contrasting landscape, ranging from the open and flat agricultural landscape of the Fens, to the rolling uplands of the Lincolnshire Wolds, the unique coastal landscapes, and the woodlands of the Breckland. The region also contains landscapes of national importance including Areas of Outstanding Natural Beauty (AONBs), each recognised for their unique landscape character – the Lincolnshire Wolds, the Norfolk Coast, the Suffolk and

Heath Coasts, the Chilterns and Dedham Vale, and the Norfolk and Suffolk Broads (National Park). The Broads is Britain's largest wetland covering an area of 303km<sup>2</sup>, and is recognised for its distinctive landscape, consisting of rivers, broads (shallow lakes), marshes and fens, rich in rare habitats, supporting a myriad of plants and animals.

The diversity of the landscape is reflected by the number of distinctive 'Joint Character Areas' (JCA) identified in the Anglian Water region. JCAs describe the physical (geology, topography, soils), cultural and historical influences that define a distinctive 'character area'. Whilst the landscape character of the Anglian Water region is still apparent, the general trend has been a steady decline in distinctiveness both within and between character areas. This has been the result of changes to agricultural practices, the impact of built development, roads and service infrastructure, and other human activity, such as recreation.

#### *Air Quality (incorporating climate change)*

In the context of the WRMP the SEA indicator 'Air' has been used to encompass greenhouse gas emissions and consequently the link with climate change. For the 2006/07 reporting period Anglian Water generated:

- CO<sub>2</sub> eqs: 144,873, 630 kg (144.87 thousand tonnes)
- C eqs: 39,510,990 kg (39.51 thousand tonnes)

The energy usage required by future water resource and demand management activities has been assessed within the SEA.

The key environmental issues and the SEA topics relevant to them are shown in Table 1.

### SEA Objectives and Indicators

The objectives for the SEA relevant to the potential water resource development schemes for the Draft WRMP were identified from the 8 topic areas categorised by the review of the relevant PPPs and establishment of the environmental baseline as being the most pertinent to the Anglian Water region. A total of 20 objectives were assigned to the topics to reflect the emphasis that needs to be placed on them; in particular on biodiversity, cultural heritage, water and landscape.

For each of the objectives indicators of sensitivity and magnitude of impact matrices were developed to allow evaluation of the potential significance of effects

to be made. The indicators included a combination of quantitative and qualitative elements, the latter involving professional judgement.

The SEA objectives and their respective indicators are shown in Table 2.

### Application of the UK Habitats Regulations

The European Court of Justice (ECJ) ruled in 2005 that the provisions of Articles 6(3) and 6(4) of the Habitats Directive (Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora) had not been correctly interpreted and transposed into the UK Habitats Regulations, the mechanism for delivering the Habitats Directive in the UK.

The focus of the Habitats Directive is to protect the network of European designated sites known as Natura 2000, which comprises, Special Protection Areas (SPAs), designated under the Birds Directive, and Special Areas of Conservation (SACs) designated under the Habitats Directive. The UK Government had originally only transposed the Habitats Directive as it applies to projects, but since the ECJ ruling, has now broadened the UK Habitats Regulations to encompass **land use plans only**, 'to ensure that the protection and integrity of European Sites is a part of the planning process at regional and local level.'<sup>1</sup>

Following the UK Government's interpretation of the Habitats Directive into the Habitats Regulations it has been concluded that an Appropriate Assessment of the WRMP is not required because the WRMP is not classified as a land use plan and does not set a statutory framework for permitted development. This view corresponds to the advice received from Natural England during the initial consultation on the SEA.

<sup>1</sup> Planning for the protection of European Sites: Appropriate Assessment. Guidance for Regional Spatial Strategies and Local Development Documents, DCLG, August 2006.

**Table 1 Key environmental issues**

Key Issues	Summary	Implications for WRMP	SEA Topic(s)
<b>Maintenance and Enhancement of Biodiversity</b>	<p>There are a large number of nationally and internationally protected sites (SSSIs, SACs, SPAs and Ramsar) throughout the Anglian Water region. Because of the high density of protected sites Biodiversity considered to be the most significant of the SEA topics with regard to the WRMP SEA.</p> <p>Currently, all Anglian Water owned or managed SSSIs are meeting the UK Government's Public Service Agreement Target of 95% of SSSI sites in 'favourable' or 'recovering' condition by 2010, however, but a number of SSSIs not managed by Anglian Water are not.</p> <p>The Anglian Water region also encompasses a wide range of biodiversity character areas comprising key BAP habitats which will also need to be considered within the SEA.</p>	<p>The WRMP has the potential to have a significant effect on designated sites, particularly those dependent on water, e.g. the fens.</p> <p>Any works carried out for the WRMP should avoid damaging both designated and undesignated sites, and where possible seek to enhance biodiversity.</p> <p>For Anglian Water owned or managed SSSIs favourable conditions should be maintained, whilst for those not managed by Anglian Water the WRMP should not cause a decline in the condition.</p>	Biodiversity, Flora and Fauna
<b>Improvement in Water Quality</b>	<p>Chemical and biological river water quality has improved over the last three years. However, both biological and chemical water quality for the region are below the national average, significantly below the national average in the case of chemical water quality where only 46% of rivers are considered to be of 'good' quality as opposed to the national average of 64%.</p>	<p>The WRMP is an important mechanism for helping to maintain and improve chemical and biological river water quality, though careful management of water sources to maintain river flows and to support ecological activities and habitats.</p>	Water, Biodiversity
<b>Monitor Water Resources</b>	<p>In areas of the Anglian Water region surface waters are already fully committed during summer months, whilst some winter abstractions are no longer reliable. Likewise, groundwater is considered to be over licensed or over abstracted in some areas. The Anglian Water region has been classified as in serious water stress by the Environment Agency.</p>	<p>Water sources need to be identified which can be used without causing adverse environmental effects, either through being used when water is plentiful or looking at alternative sources of raw water.</p> <p>Steps should be taken to reduce the quantity of water being used by both domestic and commercial customers.</p> <p>Leakage reduction measures should be identified to reduce wastage where appropriate.</p>	Water, Humans
<b>High Soil Quality</b>	<p>The Anglian Water region contains some of the best and most versatile agricultural land in England. 58% of the UK's grade 1 &amp; 2 agricultural soils are located within the East of England region.</p>	<p>The WRMP should seek to avoid development on high grade agricultural land.</p>	Soil, Landscape

Key Issues	Summary	Implications for WRMP	SEA Topic(s)
<b>Reduce the risk of flooding</b>	The Anglian Water region contains areas of both fluvial and coastal floodplain, which serve an important role for wildlife whilst protecting built up areas from the affects of flooding.	The WRMP should avoid proposing developments within the floodplain to both maintain the quantity and quality of flood plain for wildlife whilst also reducing the likelihood of Anglian Water assets being affected by flooding.	Water, Climatic Factors
<b>Reduce Greenhouse Gas Emissions</b>	Anglian Water as a company produces a significant volume of greenhouse gases as a consequence of the energy intensive processes required to both treat and transport water.	The WRMP can contribute towards the UK targets for greenhouse gas emission reductions, by ensuring the impacts of operations are minimised, and through the provision of sustainable water resources with less reliance on energy intensive processes or alternatively the use of renewable energy.	Climatic Factors
<b>Population Growth</b>	The Anglian Water region population is predicted to grow by some 850,000 by 2035. Growth areas such as Milton Keynes have high targets for house building over the next 25 years.	The WRMP needs to take account of the increased growth within its demand forecast. New developments should be fitted with water efficient devices to follow policy in the Government 'Future Water' report and ensure the targets within the Code for Sustainable Homes are achieved.  Access and Recreation – maximise potential for developments as valuable 'Green Infrastructure'.	Population
<b>Protect the Landscape Character</b>	There are several important designated landscapes, 4 AONBs and a National Park and distinctive landscape character areas within the Anglian Water region, some of which have experienced changes inconsistent with character. For example, changes in woodlands, agricultural practices, and development pressure.	The WRMP needs to ensure that future water resource developments are not located in areas of high landscape importance and that sympathetic design is promoted.	Landscape

**Table 2 SEA objectives and indicators**

SEA Topic / Objective	Indicator(s)
1. To maintain, protect and, where practicable, enhance all designated conservation sites within the Anglian Water region.	Number of SSSIs, SACs and SPAs in favourable condition
2. To ensure that the WRMP does not lead to the fragmentation of habitats.	Variety of UKBAP habitats affected by the plan
3. To ensure the sustainable management of non-designated wildlife sites and the ecological processes on which they depend.	Number of Local Nature Reserves
4. To promote the efficient use of water by new and existing domestic customers.	Code for Sustainable Homes per capita consumption indicators
5. To promote the efficient use of water by new and existing commercial customers.	Water Delivered
6. To continue to promote recreational and access opportunities for the wider community of Anglian Water owned sites.	Number of visitor centres / public access to conservation sites
7. To minimise the quantity of Grade 1 and 2 agricultural land taken out of permanent production for water resource development.	Ha of land / % of total Grade 1 and 2 land taken out of agricultural production
8. To focus the development of future resources on brownfield sites.	Utilisation of brownfield land, existing Anglian Water sites/facilities or greenfield land for the development of the scheme/plan
	% of brownfield land used as a total of the WRMP
9. To ensure abstractions are made from sustainable water resources.	Availability of surface water for abstraction
	Availability of groundwater for abstraction
10. To improve and maintain water quality in surface and ground waters.	Potential to affect biological and chemical river water quality (based on existing predominant WQ grade)
	Potential to adversely impact on groundwater quality at abstraction point (based on groundwater source protection zone)
11. To maintain or progress towards achieving good ecological status under the WFD for all surface and groundwater resources within the Anglian Water region.	Potential impact on status of surface and groundwater resources under WFD risk criteria

SEA Topic / Objective	Indicator(s)
12. To minimise the risk of flooding by ensuring existing floodplain is not used for water resources developments.	Potential impact of proposed scheme on flood risk
13. To site future above ground water resources infrastructure beyond the limit of the floodplain to reduce damage to assets from flooding or increase the risk of flooding within the wider area.	Risk posed by floodplain on proposed scheme
14. To maintain leakage at the economic level.	Reported leakage level in comparison to Economic Level of Leakage (ELL).
15. To preserve and enhance sites, features, areas and settings of archaeological, historical and cultural heritage importance.	Number of historical/archaeological assets of international/national importance within a 500m or 1km radius of the proposed scheme (site or pipeline).
16. To protect areas with known high potential for archaeological resources where the full significance and extent of archaeological remains has yet to be determined.	Professional judgement using data from publications, English Heritage National Monuments Register and County Historic Environment Register. Consideration of sites and artefact find spots within a 500m or 1km radius of the proposed scheme depending on whether a pipeline or site.
17. To protect and enhance the landscape character of designated and undesignated areas within the Anglian Water region	Will the scheme or plan have an adverse impact on landscape character and visual amenity, including setting of AONBs and national parks?
18. To protect and enhance the quality of historic parkland and gardens within the Anglian Water region.	Presence of registered historic parks and gardens
19. To reduce the energy use and increase the energy efficiency of the water supply network.	Energy (KWh) / MI
20. To address the causes of climate change by reducing the energy consumed during water treatment and distribution.	CO <sub>2</sub> (tonnes) CO <sub>2</sub> (tonnes) / MI supplied

## Assessment of WRMP Options

In developing the Draft WRMP, Anglian Water identified a long list of scheme options that could be implemented to achieve the required level of water supply within each of the 12 WRZs. In assessing the potential environmental effects of the Draft WRMP, Anglian Water adopted the UKWIR Guidance which advocates undertaking the assessment of the WRMP in two stages:

**Stage 1:** assessment of water resource and demand management schemes

**Stage 2:** assessment of the WRMP programme (combination of schemes).

This way the potential environmental effects of the programme can be understood from the scheme level up. Each scheme was subjected to evaluation against each of the SEA objectives identified in Table 2 utilising data held on a Geographical Information System (GIS) developed for Anglian Water specifically in relation to water resource development schemes, allowing both quantitative and qualitative judgements to be made.

Over 50 individual schemes were assessed in the first stage and feedback on the potential environmental effects provided to the WRMP team.

The programme level assessment took a more strategic look at the potential environmental effects of the schemes, by looking beyond the environment surrounding the individual options at the bigger picture, focussing on the potential impact on systems, in particular the water resource capabilities of the Anglian Water region as a whole. The baseline analysis of Anglian Water's water resource planning model forecasts relatively small deficits in water supplies in most of the WRZs and consequently, there has been no need to include major water resource developments at this stage. The Draft WRMP therefore comprises demand management and a number of small scale water resource developments.

The combinations of schemes for water resource development with treated water transfers and demand management included within each WRZ for the Draft WRMP are shown in Table 3.

## Assessment of Alternatives

Demand management through metering, promoting the efficient use of water and leakage control is at the heart of Anglian Water's WRMP and therefore the impacts of these measures are taken into account in its supply-demand model. The outcome of the model is a Least Cost Forecast which indicates that the forecast level of deficit within the WRZs does not currently require major water resource developments such as reservoir storage or the bulk transfer of raw water across the region. It is planned to meet the forecast deficits through relatively small scale phased schemes using current underused licensed quantities and the increased discharges that will result from plans for growth in the region. Demand management and leakage control will remain a priority alongside or in advance of water resource developments.

As a consequence of the limited need for water resource development no alternative WRMPs have been developed or assessed within the SEA. However, Anglian Water recognises that in the longer term beyond the current WRMP period (2010 – 2035) there may be a need to consider other strategic water resource options such as a major reservoir or bulk raw water transfers if, for example, demand is greater than forecast, or factors such as climate change or environmental legislation influence supply. Anglian Water proposes to carry out further more detailed investigations during the next 5 years into the availability of water resources for transfer from the lower River Trent and the storage of winter flows in a new reservoir in South Lincolnshire.

The demand forecast is derived from estimates for the growth in population and property numbers provided to Anglian Water from Government and the regional and local planning authorities. All statutory water undertakers have a legal obligation to supply water to new households and commercial premises for domestic use. Consequently, although the SEA Directive requires the "do-nothing" scenario to be considered, for WRMPs this is not an option that a statutory water undertaker can consider and has therefore not been included in the SEA.

**Table 3 Water resource development/treated water transfers and demand management schemes in the Draft WRMP within WRZs**

<b>WRZ1: South Humberside</b>	<b>WRZ7: Norfolk Rural</b>	<b>WRZ11: Ruthamford</b>
Covenham – Irby to Elsham WTW transfer Active Leakage Control Pressure Reduction Cistern Displacement Devices Household Water Audits	Great Ouse Groundwater reallocation Brandon PZ transfer Transfer from Wisbech PZ Targeted Metering Active Leakage Control Cistern Displacement Devices Household Water Audits	Integrating enhanced metering in WRZ Uprating of Bedford Ouse WTW Re-commission of Pulloxhill WTW Re-commission of Foxcote Reservoir WTW Peterborough discharge reuse
<b>WRZ2: Lincoln</b>	<b>WRZ8: Norwich and The Broads</b>	<b>WRZ12: Hartlepool</b>
Covenham – Irby to Elsham WTW transfer New Lincoln WTW Grove WTW extension Targeted Metering Active Leakage Control Pressure Reduction Cistern Displacement Devices Household Water Audits	Great Ouse Groundwater reallocation Norwich Groundwater Source Norwich Urban Source Active Leakage Control Pressure Reduction Household Water Audits	No schemes required
<b>WRZ3: Lincolnshire Coastal</b>	<b>WRZ9: Cambridgeshire and West Suffolk</b>	
Covenham WTW transfer Active Leakage Control Pressure Reduction	Great Ouse Groundwater reallocation Thetford PZ transfer Ely PZ transfer Colchester PZ transfer Brandon PZ transfer Cistern Displacement Devices Pressure Reduction Metering Active Leakage Control	
<b>WRZ4: Lincolnshire Fens</b>	<b>WRZ 10: East Suffolk and Essex</b>	
New Lincolnshire Fens WTW Pressure Management	Ipswich PZ transfer Colchester PZ transfer Ipswich discharge reuse Re-commission of Bucklesham WTW with aquifer storage Targeted Metering Active Leakage Control Pressure Reduction Cistern Displacement Devices Household Water Audits	
<b>WRZ5: Fenland</b>		
Snettisham PZ transfer Ruthamford WRZ transfer Kings Lynn PZ transfer Extension to Fenland WTW Active Leakage Control Cistern Displacement Devices		
<b>WRZ6: North Norfolk Coast</b>		
Secondary Groundwater use Targeted Metering Active Leakage Control Pressure Reduction Cistern Displacement Devices Household Water Audits		

## Summary of Environmental Effects of the Draft WRMP

The key potential environmental effects of the Draft WRMP are described in the following sections.

### *Biodiversity, Flora and Fauna*

There are a large number of national and international designated nature conservation sites within the Anglian Water region, several of which are within Anglian Water land. Those sites most likely to be affected by water resource schemes are those that are water dependent. Increased abstraction of groundwater could influence river levels and groundwater levels in sensitive sites.

The scale of water resource development schemes included in the Draft WRMP are not generally considered likely to give rise to any significant impacts on major designated sites. However, schemes proposed to increase abstractions may have an adverse effect on surface water flows or groundwater levels. Similarly schemes to relocate or reuse discharges from WWTWs may effect surface flows and the water quality of the receiving watercourse or coastal water. In all cases, more detailed investigations will be required to identify and quantify impacts as part of the normal process for seeking permissions necessary for implementation. Appropriate Assessment under the Habitats Regulations 2004 may also be required in some cases.

### *Human Beings*

The provision of adequate supplies of clean water is considered an important part of maintaining the health of the population and therefore the benefit of the Draft WRMP in achieving this is self evident. Good health is also achieved through maintaining the amenity value of the land and providing recreational facilities.

The Draft WRMP will contribute to the general amenity value of the environment through maintaining good water supplies and utilising brownfield land for new developments. Existing recreational facilities at Anglian Water sites will be unaffected by the proposed water resource schemes. Some disturbance to community assets such as footpaths, bridleways and open areas is anticipated for some of the new schemes, however, impacts are unlikely to be significant and will be temporary during the construction phase.

### *Land Use and Development*

Urban creep is a growing problem in rural areas and the use of greenfield land is seen as being both undesirable and unsustainable, particularly for industrial uses.

Re-use of existing sites or other brownfield land is considered a more sustainable option.

The Draft WRMP does not require significant new above ground infrastructure to be constructed. For the most part, new infrastructure will be confined to underground pipelines or additional treatment facilities at existing Anglian Water sites. The use of brownfield land will be maximised.

A large part of the Anglian Water region is taken up by agricultural land and indeed, the region contains some of the best (Grade 1 and 2) agricultural land in the country. Such land is vital to the production of food and other agricultural commodities.

Only one scheme is currently anticipated to require use of agricultural land but this is a very small area and would have no significant impact on the productivity of the area.

### *Water*

Anglian Water currently provides water supplies for over 4 million customers within its region. The forecast of a need to provide additional water supplies available over the plan period is due to planned growth in the regional population of around 18% and the need for increased headroom to allow for risk and uncertainty in the water resource planning process. Although this can be achieved, Anglian Water will be maintaining and increasing its demand management and water efficiency initiatives in order to achieve reductions in demand wherever possible. Within its plan Anglian Water expects to achieve a decline in measured water consumption to 129 litres per person per day over the plan period.

Measured water quality in rivers and watercourses in the region (data collected by the Environment Agency) indicates a trend of improvement over recent years, with biological and chemical indicators showing 'good' or 'very good' quality. It is anticipated that the water resource schemes within the Draft WRMP will contribute to continued improvements in the major rivers and groundwater resources. Some minor localised water quality reductions may occur in some areas due to changes in the location or quantity of surface water discharges, however, these changes may also result in improvements elsewhere.

Flood risk is considered to be a potential problem at some locations where additions to existing or new treatment facilities are being proposed. However, for

the most part the risk is to flooding of the facility rather than adverse impacts on floodplain storage. Appropriate flood control measures will need to be incorporated into the detailed design of new facilities.

#### *Archaeology and Cultural Heritage*

The Anglian Water region has a rich and diverse archaeological heritage which is reflected in the large number of sites and features that have been recorded. Anglian Water currently undertakes significant archaeological work for many of its infrastructure schemes and adopts a proactive approach to dealing with archaeological and cultural heritage assets.

Most of the pipeline schemes proposed within the Draft WRMP have the potential to impact on known and unknown archaeological assets, however, without more detailed investigation it is not possible to quantify the likely significance. Pipeline routes will be subject to further detailed study and investigation. Such studies will be undertaken in consultation with English Heritage and the local planning authorities and dealt with on a project by project basis.

#### *Landscape*

The landscape character of the Anglian Water region is dominated by low lying fenland with some higher such as the Lincolnshire Wolds, the Lincoln Edge and the Suffolk Heights. Many areas are also considered to be of historic value in relation to the archaeology. The introduction of new structures into the landscape can change the amenity value and sense of place.

The Draft WRMP does not include any major above ground infrastructure developments that could result in long term impacts on the landscape. Temporary impacts during the construction of pipelines are expected but without more detail on the routes and construction methods etc., it is not possible to quantify the impacts. These will be subject to project level studies, most informing wider EIAs.

#### *Air and Climate*

The world's climate is dynamic and naturally fluctuates in cycles, some of which have now been shown to be affected by human activities. One of the main human causes of climate change is recognised as being from emissions of 'greenhouse gases', such as carbon dioxide, which are by-products of energy generation.

The abstraction, treatment and distribution of drinking water all require energy and therefore it would be expected that increased demand for water would result in a matching demand for energy consumption. The resource development schemes within the Draft WRMP will result in an increase in energy consumption and

therefore increased CO<sub>2</sub> emissions. Although the effect of active leakage control, demand management and water efficiency measures will counteract this a net reduction in CO<sub>2</sub> emissions will only be achieved by improvements to the efficiency of existing plant. No specific allowance has been made for this in the Draft WRMP, although Anglian Water is addressing its use of energy as part of its business planning process. The 5-yearly review of the Plan will review the overall carbon footprint and also allow changes to be made in response to climate change.

#### *Mitigation*

The assessment of the demand management and water resource development schemes undertaken for the SEA indicates that the Draft WRMP represents a sustainable approach to meeting Anglian Water's statutory responsibility to supply potable water to its customers over the plan period.

There will, however, still be environmental and social impacts that need to be addressed at the project level. Many of the schemes proposed within the Draft WRMP include pipelines and greater use of existing abstraction licences to deliver the required level of water supply. A 'best fit' approach has been employed, through the use of GIS-based constraints mapping, to try and avoid causing significant environmental effects. However, the level of detail available at this strategic level is such that it is impossible to consider all potential impacts. Many of the schemes in the Draft WRMP will require more detailed assessments as part of EIAs to be undertaken when they are taken forward to detailed design and planning. It is expected that these studies will further delineate and quantify potential impacts, many of which it is anticipated can be avoided or minimised through changes to the scheme design or, in the case of pipelines, to the route alignment.

#### *Monitoring*

In general, mitigation monitoring will be required by conditions imposed by the relevant consenting authority, such as the Environment Agency, for abstraction licences and discharge consents, or the local planning authorities in planning consents. For schemes requiring EIA, the need for specific monitoring will be dependent on the nature and scale of identified impacts. At this stage, it is not possible to describe what this might include at the project level.

Impact monitoring is also dependent to a large extent on the findings of future studies that will inform the development of individual schemes within the WRMP.

A series of measures has been proposed to monitor the performance of the WRMP and to assess whether predicted significant effects in the SEA are accurate. These

include a combination of data from third party monitoring, such as that done by the Environment Agency and other statutory stakeholders, and specific monitoring of environmental parameters to be undertaken by Anglian Water.

### Conclusion

The Draft WRMP has been developed to meet the forecast demand for water supply in the Anglian Water region over the period 2010 – 2035, taking into account forecast surplus and deficits across its 12 WRZs. The Draft WRMP comprises a combination of demand management measures, water network transfers and water resource development schemes.

In undertaking an SEA of the Draft WRMP, potentially significant environmental effects have been identified for some schemes in some areas. For the most part, the risks of significant effects are a result of the lack of detailed information available for individual schemes at the planning stage and in all likelihood, can be avoided or minimised during future detailed design work and as a result of EIA studies.

Measures have been identified to allow Anglian Water to monitor the performance of the WRMP when implemented.

Overall, in addition to ensuring a reliable, secure supply of clean drinking water, the Draft WRMP will have some environmental benefits including, improving aquatic environments through enhanced wastewater treatment, enabling the further development of recreational facilities, and making water savings through continued leakage control and enhanced metering of domestic households.

### Environmental Report and Comments on the SEA

Copies of the full Environmental Report can be obtained from the address below.

David Harker  
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Comments on the SEA can be sent to the same address. Comments on the Draft WRMP as a whole should be sent direct to Defra, who will forward them to Anglian Water. The Summary Report and Main Report for the Draft WRMP are published along with this report on the website ([www.anglianwater.co.uk](http://www.anglianwater.co.uk)) with details of how to comment on them.

The closing date for comments on the Draft WRMP and its Environmental Report is **4<sup>th</sup> August 2008**. Anglian Water will publish a Statement of Response to representations received later in 2008.

Appendix 1: Relevant Policies, Plans and Programmes

Relevant Policies, Plans and Programmes	
<b>International</b>	
<ul style="list-style-type: none"> <li>World Summit on Sustainable Development (WSSD, 2002) Commitments</li> <li>Millennium Development Goals (MDGs, 2000)</li> <li>UN Framework Convention of Climate Change (UNFCCC, 1992)</li> <li>Kyoto Protocol (1997)</li> </ul>	<ul style="list-style-type: none"> <li>Berne Convention on the Conservation of European Wildlife and Natural Habitats (1979)</li> <li>Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979)</li> <li>Ramsar Convention on Wetlands of International Importance especially as Wildfowl Habitat (1971)</li> </ul>
<b>European</b>	
<p><b>Water</b></p> <ul style="list-style-type: none"> <li>Water Framework Directive – Integrated River Basin Management for Europe (2000/60/EC)</li> <li>Council Directive concerning Urban Waste Water Treatment (91/271/EEC)</li> <li>Council Directive on the Quality of Water intended for Human Consumption (98/83/EC)</li> <li>Council Directive concerning the quality of Bathing Water (76/160/EEC)</li> <li>Directive concerning the management of bathing water quality and repealing Directive 76/160/EEC (2006/7/EEC)</li> <li>EC Freshwater Fish Directive (78/659/EEC)</li> <li>Council Directive on the protection of groundwater against pollution caused by certain dangerous substances</li> </ul>	<p><b>Nature and Biodiversity</b></p> <ul style="list-style-type: none"> <li>Council Directive on the Conservation of Wild Birds (79/409/EEC)</li> <li>Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC)</li> </ul> <p><b>Air and Climate</b></p> <ul style="list-style-type: none"> <li>Air Quality Framework Directive (96/62/EC)</li> <li>Second European Climate Change Programme (ECCP II, 2005)</li> <li>Council Directive establishing a Scheme for Greenhouse Gas Emission Allowance Trading (2003/87/EC)</li> </ul> <p><b>Landscape</b></p> <ul style="list-style-type: none"> <li>European Landscape Convention</li> </ul>
<b>National (United Kingdom)</b>	
<p><b>Legislation</b></p> <ul style="list-style-type: none"> <li>Wildlife and Countryside Act 1981</li> <li>The Natural Environment and Rural Communities Act 2006</li> <li>Countryside and Rights of Way Act 2000</li> <li>Planning (Listed Buildings and Conservation Areas) Act 1990</li> <li>Ancient Monuments and Archaeological Areas Act 1979</li> </ul>	<ul style="list-style-type: none"> <li>Future Water – The Government’s water strategy for England (Feb 2008)</li> <li>Making space for water: taking forward a new Government strategy for flood and coastal erosion risk management in England (March 2005)</li> <li>Code for Sustainable Buildings. A step change in sustainable building practice, December 2006.</li> <li>White Paper Heritage Protection for the 21<sup>st</sup> Century (8<sup>th</sup> march 2007)</li> <li>The Government Statement ‘The Historic Environment: a force for our future’ (DCMS)</li> </ul>

<b>Relevant Policies, Plans and Programmes</b>	
<ul style="list-style-type: none"> <li>• Draft Climate Change Bill</li> </ul> <p><b>UK Policies and Strategies</b></p> <ul style="list-style-type: none"> <li>• Securing the future – UK Government Sustainable Development Strategy (2005)</li> <li>• Sustainable Communities Plan: Building the Future (2003)</li> <li>• Sustainable Communities: People, Places and Prosperity (2005)</li> <li>• Sustainable Communities: Homes for All (2005)</li> <li>• Sustainable Farming and Food Strategy – Forward Look (2006)</li> <li>• Climate Change – UK Programme (2006)</li> <li>• UK Biodiversity Action Plan (UKBAP)</li> <li>• Working with the grain of nature – A biodiversity strategy for England (2002)</li> <li>• Directing the flow – priorities for future water policy (Nov 2002)</li> </ul>	<p>2001)</p> <p><b>Planning Policy Guidance and Statements</b></p> <ul style="list-style-type: none"> <li>• PPS 1: Delivering Sustainable Development</li> <li>• PPG2: Green Belts</li> <li>• PPS 3: Housing</li> <li>• PPS 6: Planning for Town Centres</li> <li>• PPS 7: Sustainable Development in Rural Areas</li> <li>• PPS 9: Biodiversity and Geological Conservation</li> <li>• PPG15: Planning and the historic environment</li> <li>• PPG16: Archaeology and Planning</li> <li>• PPS 25: Development and Flood Risk</li> </ul>
<b>Regional</b>	
<p><b>East of England</b></p> <ul style="list-style-type: none"> <li>• Sustainable Futures: The Integrated Regional Strategy for the East of England (2005)</li> <li>• East of England Plan: Draft Revision to the Regional Spatial Strategy (RSS) for the East of England (Dec 2004)</li> <li>• East of England Plan – the Secretary of State’s proposed changes to the Draft revision of the regional spatial strategy for the East of England, December 2006.</li> <li>• A Shared Vision: The Regional Economic Strategy for the East of England (Nov 2004)</li> <li>• Our Environment, Our Future: The Regional Environment Strategy for the East of England (July 2003)</li> <li>• Regional Housing Strategy for the East of England: 2005-2010 (July 2005)</li> <li>• Sustainable Tourism Strategy for the East of England (March 2004)</li> </ul> <p><b>East Midlands</b></p> <ul style="list-style-type: none"> <li>• East Midlands, Integrated Regional Strategy – Our Sustainable Development Framework (Jan 2005)</li> <li>• Draft East Midlands Regional Plan (Sept 2006)</li> <li>• Putting Wildlife Back on the Map – A Biodiversity Strategy for the East Midlands (May 2006)</li> <li>• Regional Economic Strategy for the East Midlands 2006-2020 East Midlands,</li> <li>• Regional Environment Strategy (Aug 2002)</li> </ul>	<p><b>North East of England</b></p> <ul style="list-style-type: none"> <li>• The Integrated Regional Framework – Achieving a better quality of life (2004)Regional Spatial Strategy – VIEW: Shaping the North East (Draft Submission, June 2005)</li> <li>• Regional Economic Strategy 2006-2016 – Leading the way</li> <li>• North East Strategy for the Environment (Consultation Draft, Dec 2006)</li> <li>• Regional Housing Strategy – A new housing strategy for the North East</li> <li>• North East England Tourism Strategy 2005-2010</li> </ul> <p><b>Yorkshire and Humber</b></p> <ul style="list-style-type: none"> <li>• Advancing Together, The Vision and Strategic Framework for Yorkshire and Humber Regional Spatial Strategy, The Yorkshire and Humber Plan (Draft for Public Consultation, Dec 2005)</li> <li>• The Regional Economic Strategy for Yorkshire and Humber 2006-2015</li> <li>• The Regional Environmental Enhancement Strategy for Yorkshire and the Humber (Sept 2003)</li> <li>• Yorkshire and The Humber, Regional Housing Strategy 2005-2021</li> </ul> <p><b>South East of England</b></p> <ul style="list-style-type: none"> <li>• Integrated Regional Framework 2004: A Better Quality of Life in the South East</li> <li>• The South East Plan: A Clear Vision for the South East (Draft, March 2006)</li> </ul>

Relevant Policies, Plans and Programmes	
<ul style="list-style-type: none"> <li>The East Midlands Tourism Strategy 2003-2010 (Oct 2003)</li> <li>The East Midlands, Regional Housing Strategy 2004-2010</li> </ul>	<ul style="list-style-type: none"> <li>The Regional Economic Strategy 2006-2016: A Framework for Sustainable Prosperity</li> <li>South East Regional Housing Strategy (2006 Onwards)</li> <li>Tourism ExSELLence: The Strategy for Tourism in the South East (2004)</li> </ul>
<b>Sub-regional</b>	
<ul style="list-style-type: none"> <li>Broads National Park Management Plan</li> <li>AONB Management Plans (Lincolnshire Wolds; Norfolk Coast; Suffolk Coast and Heaths; Dedham Vale and Chilterns)</li> </ul>	
<b>Environment Agency Strategies</b>	
<p><b>Regional Water Resource Strategies</b></p> <ul style="list-style-type: none"> <li>Water resources for the future – A Strategy for North East Region (2001)</li> <li>Water resources for the future – A Strategy for Anglian Region (2001)</li> </ul> <p><b>Catchment Flood Management Plans</b></p> <ul style="list-style-type: none"> <li>Grimsby and Ancholme CFMP (Draft Plan, June 2006)</li> <li>River Witham CFMP (Scoping Report, Oct 2006)</li> <li>Louth Coastal CFMP (Draft Plan, Nov 2006)</li> <li>North Norfolk CFMP (Scoping Report, Dec 2006)</li> <li>Broadland Rivers CFMP (Draft Plan, June 2006)</li> <li>East Suffolk CFMP (Scoping Report, Sept 2006)</li> <li>River Nene CFMP (Draft Plan, July 2006)</li> <li>Great Ouse CFMP (Draft Plan, Feb 2007)</li> <li>River Welland CFMP (Scoping Report, Nov 2006)</li> <li>North Essex CFMP (Draft Plan, April 2006)</li> <li>South Essex CFMP (Scoping Report, May 2006)</li> <li>River Tees CFMP (Scoping Report, Jan 2007)</li> </ul>	<p><b>Catchment Abstraction Management Strategies</b></p> <ul style="list-style-type: none"> <li>The Grimsby, Ancholme and Louth CAMS (April 2006)</li> <li>The Nene CAMS (March 2005)</li> <li>The Steeping, Great Eau and Long Eau CAMS (Consultation Draft, Jan 2007)</li> <li>The Welland CAMS (Consultation Draft, Dec 2006)</li> <li>The Witham CAMS (March 2004)</li> <li>The Broadland Rivers CAMS (March 2006)</li> <li>The Combined Essex CAMS (Feb 2007)</li> <li>The North Norfolk CAMS (March 2005)</li> <li>The South Essex CAMS (June 2004)</li> <li>The Cam and Ely Ouse CAMS (March 2007)</li> <li>The North West Norfolk CAMS (March 2005)</li> <li>The East Suffolk CAMS (Jan 2008)</li> <li>The Old Bedford including Middle Level CAMS (March 2006)</li> <li>The Upper Ouse and Bedford Ouse CAMS (March 2005)</li> <li>The Thame and South Chilterns CAMS (March 2007)</li> <li>The Trent Corridor CAMS (Dec 2003)</li> <li>The Lower Trent and Erewash CAMS (March 2008)</li> <li>The Wear CAMS (Sept 2006)</li> </ul>