ENVIRONMENT AGENCY

SEEDA SOUTH EAST ENGLAND DEVELOPMENT AGENCY
Working for England's World Class Region

South East **Water Resources** Forum

Report of First Annual Conference
2002

INTRODUCTION

Of all the emotive topics that are raised when development in the South East of England is discussed, water seems to be near the top of the list. Whether from the water supply company perspective, from the wastewater perspective, from the Environment Agency, planners, developers, existing and future customers, environmental bodies or elected representatives, strong views are expressed.

All these views are legitimate, but too often they are disparate and conflicting. For example, our region is the prime focus for economic growth and development in England, yet scarcity of water is often cited as a reason for limiting development here. Availability of water varies across the region; some areas face real difficulties, others are relatively comfortable. We are one of the driest parts of the country, but we use more water per head of population than other regions. Some of our rivers have flooded dramatically in the last few years, yet we know that we cannot protect all property, and that planned flooding can alleviate problems elsewhere. Those same rivers may suffer from low flows in summer, creating potential risks for health, wildlife and recreational uses, but there are demands for further abstraction and for additional sewage discharges from new development. These are just some of the challenges and conundrums that we face in managing our water resources in South East England.

The South East Water Resources Forum is an informal grouping sponsored jointly by SEEDA and the Environment Agency. It was established in 2001 to engage stakeholders in identifying and responding to known and potential water challenges in the South East, with the aim of ensuring a sustainable approach to development in the region. It is intended to bring together all the disparate views and voices, and membership is open to anyone with an interest in any aspect of water resources. One of its aims is to identify where common ground exists and add the Forum's weight to arguments put forward by individual organisations. Where disagreement exists, its aim is to ensure each party understands the other's viewpoint, but it will also strive to find new and innovative solutions to water issues.

The Forum has an Executive and Chairman, both approved at the Forum Conference in May 2002. The annual conference is the main event of the year for the Forum and is an opportunity for all members to participate in discussion and debate over the many water related issues that face the South East. These issues are not just of concern to water companies and the Environment Agency. They are of concern to all who live and work, or whose businesses operate, in our region.

The papers in this publication, which were presented at the Conference, cover many of these challenges and I am sure you will find them of interest. They include papers by

- Chris Baines, the very well known and respected environmental thinker, who set the scene for the conference with a rapid-fire keynote presentation that included many excellent slides as examples of the issues he raised. In his summary paper, he joins the list of those asking for more evidence of a joined-up approach towards management of water, a more rational and long-term approach to investment in the water sector and the need for integration of land and water management policies.
- Paul Seeley sets the scene for the South East examining how water resources are planned
- A joint paper by Brian Arkell, Wanda Fojt, Ed Maltby and Richard Thorne explains what the Water Framework Directive means to our region
- Elaine Hayes argues how the Rural White Paper, the Curry report and plans for water resources might be considered in the context of environmental protection
- Mike Gwilliam considers how water resource management and planning and spatial planning policy interact and what are the key issues that result
- John Biron looks at the future role that rural land managers can play in helping us adapt to and mitigate the effects of climate change on the water environment

The Forum asked the audience what were the key issues arising both from the papers presented and from members' personal agendas. These are also summarised in this report of the Conference. These issues have been adopted by the Executive in developing our work plan for the future.

This work plan will be one of the papers presented at the Forum Conference in May 2003.

In summary, the Forum will:

- Become a source of information, knowledge and influence
- Encourage and participate in trials and best practice for water resource management
- Influence Government, local authorities, regulators, businesses, NGO's and the public
- Promote the work of the forum via publications and the proposed web site

Seven areas of immediate work have been identified. These are:

- Regional Planning Guidance revision
- Water consumption including water efficiency
- The Water Framework Directive
- The proposed Water Bill
- Development of a web site
- The annual conference
- Professor Ed Maltby's project on sustainable management of river catchments

The South East Water Resources Forum is in its infancy. Our success will depend upon the input of members and from the work that the Executive is able to undertake on behalf of members. Above all, we must focus on action and making a difference for our region. What is certain is that the issue of managing our water resources in the South East will not go away. Climate change, European legislation, demands upon our landscape all put additional pressure upon water resources. If we are to continue to enjoy the quality of life and prosperity that our region offers, then excellent planning, management and partnerships will be needed. Our Forum intends to play its part in maintaining our quality of life.

Graham Setterfield
Chairman
South East Water Resources Forum

New reservoirs will be a key element of long-term water resource planning

FLOODS AND DROUGHTS - THE NEED FOR JOINED-UP THINKING

Chris Baines

Professor Chris Baines is an award-winning writer and broadcaster, and a freelance environmental adviser to senior executives in the public, private and voluntary sectors. He works closely with the construction and water industries, he is a national vice president of The Wildlife Trusts and a trustee of both the Heritage Lottery Fund and The Waterways Trust, and was a member of the Government's ministerial sounding board for the recent Rural White Paper. cbaines@envirolink.freeserve.co.uk

INTRODUCTION

For a country with famously drizzly summers and 'warm wet westerly winds in winter', we seem to be making a pretty poor job of managing rainwater. The past three years has seen serious flooding in one town centre after another: Peterborough, Hereford, Lewes, Uckfield, Chichester, Malton and Shrewsbury are just a few of those which have made the headlines. At the same time, many drinking water boreholes are at an all time low, naturalists are anxious about wetland habitat loss and low river flow, and global climate change is predicted to lead to seasonal droughts and water shortages, particularly in southern England.

Picture used with the kind permmission of Chris Baines

Better planning will help alleviate urban flooding

END OF PIPE SOLUTIONS

Hundreds of millions of pounds are spent each year on water management in the UK, but with the Office of Water Services (Ofwat), the price regulator, insisting that water customers pay less and regulating spending on a 5-year cycle, and the Environment Agency still tending to adopt an 'end of pipe' approach to water quality monitoring, there is precious little encouragement to treat the dispersed causes of pollution or to moderate the flow of flood waters by moving spending upstream. Clearly we need some serious joined-up thinking and an integrated approach to land and water management.

In the present round of spending sanctioned by Ofwat's quinquennial price review, the staggering sum of £1,700 million pounds is being spent on Combined Sewer Overflows (CSOs). These are the potential bottlenecks where the surface water joins the sewage before they flow together to the sewage treatment works. The sewage flow is reasonably constant, but the rainfall run-off fluctuates, and in the increasingly common torrential downpours, if the CSOs can't cope, the water tends to back up and raw sewage overflows.

Even when the CSOs do cope, some sewage treatment works are quickly overloaded in a rainstorm, and this has massive energy implications. For the most part gravity runs the sewage treatment system, but to cope with a stormwater surge, big sewage treatment works resort to pumping. Typically, if a water company has an electricity bill of £20 million per year, it will be spending at least half on pumping stormwater. This conundrum alone exposes the stupidity of short-term unsustainable end-of-pipe 'solutions'. Increasing the size of CSO at bottlenecks has the effect of increasing the rate of run-off which, in turn, is already leading to claims for defensive extra expenditure at the sewage treatment works downstream.

POROUS TOWNS AND CITIES

The £1.7 billion bill for CSO improvement has been sanctioned on a fundamentally unsustainable premise. Asked how to get stormwater more successfully through the bottleneck, most engineers will recommend a bigger pipe. Instead, the Environment Agency and others should be aiming to prevent so much of the stormwater reaching the inadequate CSOs in short, sharp waves. A more sustainable approach to stormwater management would involve all kinds of ways of holding back the water. In the urban landscape we would start to re-invent the porous city, with soak-aways in housing areas, marshes, ponds and lakes in public open spaces, porous surfaces for car-parks, and a much more extensive canopy of urban forest to slow down the rate at which the rainfall hits the ground. Of course, such an approach would need

co-operation from all kinds of urban players – house builders and supermarket managers, park keepers and highway engineers – but the technology is well proven. We even have a few impressive examples here in the UK: the network of stormwater catchment wetlands in Warrington New Town, and the rainwater recycling initiative at the Greenwich Millennium Dome show that there are convincing models at both the low-tech and the high-tech ends of the spectrum. The technology is improving, too, with companies such as Tarmac developing porous asphalt, new sub-surface tanking systems which can turn a car-park into a rainwater storage system, and rainwater collection for non-potable use in public buildings such as sports stadiums, supermarkets, schools and cinemas a practical proposition.

Picture used with the kind permmission of Chris Baines

Sustainable drainage systems reduce the rate of run-off from new developments

Of course, the technology can only work if it is specified by architects and engineers, and Sustainable Urban Drainage might take longer than Ofwat's 5-year time frame to deliver the results. The beneficial impact of this alternative approach would be incremental, making it more difficult to monitor, and there would be a need to reacquaint communities with the challenge of more ponds and wetlands on their doorstep, but we would achieve long-lasting success with far less risk of recurring failure.

RURAL SOURCES

Urban flooding clearly has some of its origins in the rural countryside and this is particularly the case with the catastrophic flash floods which have been a feature of the past few years. For example, one fifth of the rain that falls in Wales will flow through Shrewsbury, on the River Severn – so Shrewsbury's floods must be addressed, at least in part, 100 miles upstream.

For years we have squeezed farmland and forestry plantations dry, so not surprisingly a rainstorm reaches streams and rivers all too rapidly. Rural wetlands are seen as unproductive and have largely been removed from postwar farming countryside, and hills that would once have been protected by broadleaf forest or rough permanent grassland, have been deep drained and cultivated or heavily compacted and stripped bare through over-grazing. The disasters which we have seen in Honduras, in Bangladesh and Mozambique, are monstrous versions of the floods in Lewes, Uckfield and many other urban areas. The rural landscape's natural capacity to hold back rainfall has been very seriously compromised by the short-sighted desire for greater productivity at any price.We need some joined-up policies which will aid environmental recovery and lead to integrated land and water management. We should be replacing the erosive over-grazing on the hills, and helping the natural woodland to regenerate, whilst at the same time encouraging wetlands to re-occupy some of the land in rural river valleys. Then the rainstorm would be more rapidly absorbed into the rural landscape and released more gradually into the rivers. It must make sense to spend our urban subsidies on managing land and water in sustainable ways which benefit the great majority of the population who live and work downstream.

WILDLIFE BENEFITS OF SUSTAINABLE WATER MANAGEMENT

Wetter, more wooded gathering grounds and river catchments bring many benefits. The surface streams and subterranean aquifers are more consistently recharged but as a bonus this will also boost biodiversity. In areas such as Hampshire and Sussex where 70% of drinking water comes from boreholes deep within the chalk downs, management of the landscape for improved water absorption and reduced pollution would quite naturally favour organically managed, species-rich downland pasture rather than chemically sprayed grass crops or shallow cultivation. More extensive marshes, settlement lakes and reedbeds in less absorbent landscapes would replace the missing wetland habitat and extend the scope for drinking water abstraction from rivers. Unpolluted natural broadleaf woodland would slow down stormwater run-off, increase absorbency, and at the same time it would revive much of the wildlife which has declined so disastrously in the past 50 years. Wild, wet river corridors and wooded hillsides could achieve far more sustainable nature conservation than the present policy of dispersed reserves, each isolated in an ecological desert of industrial agriculture and alien forestry. This, in turn, would improve public enjoyment of the countryside and enhance the scenery which is now being recognized as such a valuable foreign earner for the British tourist industry.

New rural wetlands would also provide a very effective biological filtration system which would help to shield us from the pesticides, nitrates and other agricultural chemicals which are currently a threat to public health. At present these pollutants need to be removed at great expense by artificial filters built downstream. There are many places elsewhere in the world where water companies pay for woodland management in the uplands as a cost effective way of guaranteeing purer drinking water. The UK's water companies are amongst the largest landowners in upland Britain, so a shift from sheep to silver birch should be quite easy to achieve, and very cost effective. Lowland reedbeds can fulfil a similar role, and whilst there may be some resistance to the loss of year-round grazing, if the natural floodplains were to be managed as a mixture of both permanent and seasonal wetlands once again, the broad range of resulting benefits would far outweigh the marginal loss of food production.

Picture used with the kind permmission of Chris Baines

Wild water courses improve the environment and flood management

COASTAL DEFENCE

There is also an opportunity to adopt a more sustainable approach to sea defences. Rising sea levels and sinking land are factors of particular relevance in the South East, and the general policy of holding back the sea with banks and walls is now being challenged. Whilst hard-engineered barriers will no doubt continue to be used to protect urban settlements, there is a trend along more rural coastlines towards planned retreat, with the sea being allowed to repossess the land. Again, this often means the sacrifice of arable farmland, but along the Essex coast in particular saltmarsh and muddy creeks are now replacing winter wheat, and helping to bring back internationally important wildlife, as well as human visitors in search of wild and natural surroundings.

JOINED-UP SUSTAINABLE SOLUTIONS

The need for sustainable water management is urgent, and it is also achievable with little need for new resources. Firstly, the regulators must review their policy of short-term 5-year cycles and take long-term environmental impact assessment much more seriously. Secondly, the water industry must do even more to build alliances with all its stakeholders. The companies cannot manage water on their own. Thirdly, the government should use the issue of integrated land and water management as a clear signal of its determination to support sustainable development. Wise management of water is just one of the many good reasons to combine their rural and their urban policies in the interest of a joined-up, living landscape with a healthy future.

New European legislation is now set to reinforce the good sense of this more sustainable approach to integrated land and water management. The European Water Framework Directive sets a timetable of between 15 and 25 years in which the UK must adopt whole river catchment management and a much more ecological approach to moderating floods and reducing pollution. So far, many of the demonstrations of sustainable good practice have been carried out by conservation charities – the RSPB, The Wildlife Trusts and WWF-UK along the Essex coast, for instance, and the Wildfowl and Wetlands Trust at London's Wetland Centre, by the tidal Thames at Barnes. Funding has come from charitable trusts and from the Heritage Lottery Fund, and most of the success so far has been achieved in spite of the prevailing system. Now it is time to take sustainability more seriously. Developers, engineers and policy-makers need encouraging to work with nature to achieve long-term success, improved performance, and the full complement of social, economic and environmental benefits that can come from integrated land and water management.

WATER RESOURCE PLANNING AND FUNDING

Paul Seeley, Southern Water

EXECUTIVE SUMMARY

- This paper summarises the main steps taken by water companies in planning to meet future water demands and the associated funding mechanisms.
- The assessment of current resources and demands, the projections of future demands and the resultant resource developments or demand management measures required are discussed.
- Possible future initiatives are laid out.

INTRODUCTION

Water Supply Companies have a statutory duty under the 1991 Water Industry Act, S52 to provide a supply of water that is sufficient for domestic purposes and a secondary duty under S55 of the same act to provide water for non-domestic duties, where this does not conflict with their duties under S52.

In order to ensure these duties are fulfilled at all times, a full understanding of both the customers' demand requirements and the company's resources is required.

UNDERSTANDING THE SUPPLY DEMAND BALANCE

In order to plan and manage a company's assets and production schedule, it is crucial that the supply demand chain, both present and future, is understood and managed. For water companies this is particularly true as the timescales involved in attaining a new resource to meet future demands can be over 10 years.

The forecasting of future demands and the means by which these can be managed and met is therefore fundamental to a water company's business and is an ongoing process to ensure a robust and up-to-date supply demand balance at all times.

As the water industry is a regulated business, the assessment of the supply/demand balance and the investment required to meet future demands is of interest, not only to the individual company, but also to the industry regulators. Every 5 years The Office of Water Services (Ofwat) require water companies to submit their Strategic Business Plans (SBPs), setting out their proposed investment programme for the following quinquennium.

A large component of the investment programme is driven by the projected increase in demand and the resultant Water Resource Plan (WRP) in which is laid out the means by which the demands will be managed and met. This WRP must be signed off by the Environment Agency prior to submission to Ofwat.

In order to ensure an up-to-date understanding of the situation, the companies submit an update of their WRP each year to the Agency. This reports actual demands against forecast and any changes in assumptions with the demand forecast.

The key components of the process are laid out opposite:

DEFINING SUPPLY AND DEMAND

Demand Forecasting

Each company operates a demand forecast which projects water usage for 25 years, using estimates of population and property growth, increase in per capita water demand, changes in industrial water use, leakage estimates etc. This is updated each year with actual water usage data and the forecast "grown" from a base year.

The water demand in any one year is heavily dependent upon the weather conditions through the year, in particular the summer period. For planning purposes therefore two forecasts are created: one for a "normal" year and one for a "dry" year. The dry year forecast – defined as an assessment of a 1 in 10 year event – projects a higher average demand. Peak analysis is used to predict the level of demand that might occur at times of peak demand in July or August.

Resource Assessment

The yield from a reservoir or borehole available in any year is dependent not only on the licence of the source, but also on the rainfall over recent months and years. In a "drought year" when water levels are low, average and peak outputs from a company's sources reduce.

Assessments of the reliable yield of a source under a range of hydrological conditions can be made and for planning purposes the drought yields are used. For groundwater this is assessed using lowest historical water levels in an aquifer, for surface water more sophisticated return periods of events can be used to define drought conditions. The reliable drought yield for each source is defined under average and peak conditions; within this assessment account is also taken of any existing constraints, such as mains or treatment plant constraints, to ensure that the resource output can be delivered to the customer. These yields can then be grouped for a defined geographical area to allow resource planning at sub-company level.

In order to plan realistically, a statistical assessment of the group of sources which may not be available at any given time is made, known as the outage allowance. This includes planned maintenance work, power failure, plant failure etc. and is subtracted from the group's yield assessments to give an assessment of the average and peak water available for use (WAFU) in a dry year.

Identifying the Supply/Demand Gap

In order to assess when available supplies will no longer be able to meet projected demands, the forecast demands and WAFU are assessed at sub-company level. With a further planning allowance for uncertainty within the process (known as headroom), the time at which demand outstrips supply (both under average and peak conditions) can be identified.

MANAGING THE SUPPLY/DEMAND GAP

In order to maintain a supply/demand balance, alternative schemes to lessen demand or increase supplies must be identified and costed to ensure that the least cost option is found:

Demand Management

All companies are operating at, or close to, their economic level of leakage (ELL). This will continue into the future due to economic and regulatory pressures. Therefore the majority of the savings in "demand" due to leakage reduction have already been made, although the ELL will frequently be reassessed in the light of new technology and the cost of water. Where companies are already below the ELL, leakage will not be allowed to rise.

However, companies are also proactive in promoting water efficiency measures to reduce demand and an assessment of the success of these initiatives can be attempted. Where a cost benefit analysis can be made, future potential demand management options can be included in a company's investment strategy and within the demand forecast as a means of reducing the supply demand gap.

Metering has been shown to reduce a customer's demand and properties can no longer be compulsorily metered. All new properties are metered and a company can promote free optional metering to its customers as a means of saving money and incentivising efficient use. An assessment of the rate of meter penetration (agreed and funded by Ofwat) and the effect on demand can be made within the demand forecast.

Resource Optimisation and Enhancement

Often the most cost-effective means of reducing the supply demand gap is to optimise existing resources. This may be by recycling process water, reducing pressure constrictions with the treatment plant site or removing mains or treatment constraints.

Means of enhancing existing resources are also investigated and costed.

New Resources and Bulk Supplies

All water companies are active in discussions with neighbouring water companies to ensure effective use is made of existing water resources across the region. Bulk supplies between water companies are common, either in perpetuity or, in recent years, for a set time period.

Due to environmental pressures, especially in the South East, the Environment Agency are keen that the above options are explored prior to an application for new resources. However when the cost effective demand management options have been exhausted and other companies can no longer provide additional supplies, new resources must be considered.

Along side standard options, such as reservoirs and boreholes, are more high tech solutions such as desalination and Aquifer Storage Recovery. These are costed and considered with the traditional remedies. An assessment of the environmental costs of each scheme is included.

Funding the Maintenance of the Supply Demand Balance

Once the options for closing the supply demand gap are identified and ranked by cost per cubic meter of water released (including an assessment of environmental costs and benefits), the most cost-effective solution of removing the supply demand gap can be identified. The resultant WRP is then submitted to the Environment Agency for approval. Once this has been accepted the investment programme, required to carry out the WRP schemes, is incorporated in the company's 5 year SBP submission to Ofwat.

If the plan is accepted then the company is able to charge its customers at a rate such as to fund its full programme of supply/demand work over the subsequent 5 years. However, Ofwat may, as part of the process, challenge components of both the WRP and the investment programme. Through an iterative negotiating process a funding level will be arrived at to meet projected demands. Although the process allows companies to challenge Ofwat and give further data to support their original programme of works, the final funding may be reduced from the original submission due to Ofwat's methodology of arriving at a challenging capital allowance for growth.

This funding may result in a company running at a higher risk of failure to meet its statutory duties than it presented in its original submission. Post the funding determination, if a company feels that the negotiations did not address their concerns and that the resultant risk is too great, then they can take their case to the Competition Commission. However a transparent and robust negotiation during the submission is preferable.

Future Potential Initiatives

The supply/demand planning process is continually being updated and refined. Some new areas of collaboration which are being investigated are:

- Councils to include water efficiency at the planning stage to ensure that new build includes these measures. This will be more effective than private water companies trying to influence behaviour and retrospective installation of devices.
- Closer contact with councils to ensure water resources are taken into account in structure plans and sustainable property growth assessments.
- Grey water and water recycling options being investigated.

- The Agency's current Catchment Abstraction Management Strategy process and time-limited licences could potentially have a large impact upon source availability and long-term planning reliability and the security of public water supplies. The Agency has due regard to the requirements of public water supply, but alternative schemes that reduce environmental impact may result in increased costs which will have to be funded by higher charges.
- The government is currently consulting on revised competition legislation. Currently other water suppliers can agree an "inset appointment" with users greater than 100Mla. However recent government reports advise that this is likely to be reduced to 50Mla, increasing the number of customers who may be lost (or gained) by the incumbent water supplier. This provides both threats and opportunities for the industry but increases the uncertainty in any company's supply/demand balance projection. There currently appears to be little interest in government for competition within the domestic market.

CONCLUSIONS

All water companies carry out an ongoing water resource planning procedure. This includes assessment of the current supply/demand position, projection of future demands and a costed set of options for meeting these demands, including both resource and demand management solutions.

The least cost solutions to meet projected demands for the subsequent 5 years are submitted to the regulators in the companies' Strategic Business Plans. Through an iterative negotiating process a funding level will be reached, although this may be less than the investment programme originally planned due to Ofwat's methodology of arriving a capital allowance for growth.

Recent Environment Agency initiatives may result in reduced water availability and increase costs to reduce the environmental impact of water abstraction whilst new competition legislation will increase uncertainty in future demands.

Filling Little Testwood Lake which provides water to people in Southampton

THE WATER FRAMEWORK DIRECTIVE AND SUSTAINABLE DEVELOPMENT IN THE SOUTH EAST

Dr Brian Arkell, Environment Agency (Thames Region)
Dr Wanda Fojt, English Nature
Professor Ed Maltby & Dr R Thorne, Royal Holloway Institute for Environmental Research

KEY MESSAGES AND RECOMMENDATIONS

- Water resources are a high priority for the delivery of sustainable development, for the future prosperity of the South East and for the quality of life and environment for its citizens.
- The Water Framework Directive provides a policy framework and strategic process for achieving the sustainable management of water resources.
- There will be a significant requirement for information, understanding and conflict resolution if the objectives of the Directive are to be met.
- Environmental indicators in the Sustainable Development Framework for the South East should reflect the outcomes of the Directive and will therefore need to be monitored.
- We will require innovative tools and approaches to meet these needs.
- The Water Resources Forum can provide a unique "pathfinder" opportunity for stakeholder debate and agreement of sustainable solutions where there are so many conflicting interests and pressures in the region. It is recommended that the Water Resources Forum should engage positively with the Water Framework Directive process.

SUMMARY

- The implementation of the Water Framework Directive will begin in 2003.
- The process will identify objectives for surface water features (such as rivers and streams), groundwater and associated wetlands.
- Objectives are ecologically based and, importantly, will take into account where improvements in condition are needed.
- These objectives will be considered in relation to an integrated assessment of pressures and measures required to restore good status. These will be presented in River Basin Management Plans (RBMPs).
- RBMPs will involve public consultation.
- A system will be established to monitor progress towards objectives.
- Regional plans and strategies will need to take into account and identify how they impact on, and importantly, take forward objectives of the RBMP.
- We need to be aware that RBMPs will not coincide with government office boundaries.
- The RBMP process will add emphasis and focus on the range of issues impacting on water resources and challenges for strategic development planning, both at the basin and strategic scales.

INTRODUCTION

Water resources are fundamental to the delivery of sustainable development in the South East. Playing host to such a large, and growing, population imposes many and varied demands on our environment and natural resources. Continuing economic development and demand for new homes in the region, together with our own propensity to use more water in and around our homes, are set to increase those pressures. Water is also vital in sustaining many of the region's environmental assets, supporting rivers, lakes and wetlands and the variety of wildlife that they sustain. The quality and quantity of our water environment is under pressure in many ways from impacts such as abstraction, pollution and land-use. Superimpose on this climate change, it is evident that there are significant challenges to achieving sustainable development in the South East.

Rising to meet this challenge is a real opportunity for SEEDA and its partners, through the Water Resources Forum, to demonstrate leadership and vision in the development and application of the principles and processes of the Water Framework Directive as it is implemented through UK legislation. The significance of the region as a European hub should not be overlooked in this context; what can work here, could have significant benefits across much of Europe.

OUTLINE OF THE DIRECTIVE

The Water Framework Directive (Directive) is the most significant piece of European water legislation for over

20 years. It was adopted in late 2000 and it will need to be transposed into UK legislation by 2003.

The overall objective of the Directive is to contribute to sustainable development by preventing deterioration and improving the ecological condition of surface fresh water bodies such as lakes and rivers, wetlands, estuaries and inshore coastal waters, and the condition of groundwater. The Directive subsumes the plethora of previous directives listed in Annex 1, and builds on these with a set of new far-reaching requirements.

The transposition of the Directive into domestic legislation is an unprecedented and unique opportunity to change the nature of water resource management. Maximising the opportunity to ensure that sustainable water management, in accordance with the spirit of the Directive, is achieved will require appropriate political will and innovation.

Because sustainability is at the heart of the Directive, the consideration of environmental, economic and social needs are fully integrated. This integration is undertaken at the scale of the river basin.

The process of integration will be achieved by developing and agreeing River Basin Management Plans through participation by stakeholders. This is a new scale of approach for stakeholder involvement in water resource and environmental management in the UK and will complement the approach of regional government in achieving quality of life targets.

The emphasis on management at the river basin scale provides the opportunity to make best use of the natural functional attributes of component parts of the basin e.g. the value of wetlands in storing water and improving water quality, for wildlife and for education and recreation. The approach is therefore one based on multi-benefit to society now and in the future.

Economic considerations are an important element of the Directive, particularly looking towards the development of long-term, sustainable solutions and identifying where there may be disproportionate costs or infeasible options attributable to potential actions arising from its implementation.

The Directive demands that consultation and engagement of stakeholders is an integral part of sustainable river basin management. Successful engagement of key sectors will be achieved by demonstrating the economic, as well as environmental benefits, of improved practice. In addition to meeting the requirements of the Directive, this will also help SEEDA to deliver the objectives identified in its Regional Sustainable Development Framework, particularly those relating to economic regeneration and recreation in addition to water quality, flood amelioration, biodiversity and sustainable water use.

Objectives

The key objectives of the Directive are to:

- prevent further deterioration, protect and improve the status (condition) of freshwater ecosystems and associated wetlands and brackish water and coastal ecosystems.
- promote sustainable water use, and
- contribute to mitigating the effects of floods and droughts.

Scope

The Directive takes a holistic approach to water management with integrated river basin management forming the underlying principle. It embraces surface water, groundwater, water resources and water quality. Importantly it allows the setting of objectives for the status of water bodies and water dependent features which would be met through protection and restoration where necessary.

SURFACE AND GROUNDWATER STATUS

Surface and groundwater are considered together, in both qualitative and quantitative terms. The overriding aim of the Directive is that Member States will be required to achieve good surface water status and good groundwater status, and also to prevent deterioration in the status of waters. Furthermore, groundwaters will be managed to drive forward the "good status" of surface waters. Where current condition is assessed to be below what it should be, then specific actions will need to be taken. Condition will be defined ecologically in addition to using more traditional chemical definitions. This approach will require marrying sound science with the application of practical techniques to achieve the desired status.

There will be limited exceptions (derogations) to achieving these objectives. One particular exception concerns water bodies which are artificial in construction or where the physical structure has been irrevocably and heavily modified. The target for these water bodies will be to achieve a status of "good ecological potential"; equivalent to achieving "good status" given the constraints of the physical structure of the water body. Derogations from "good status" are also allowed in unforeseen or exceptional circumstances, such as floods or droughts and in these circumstances Member States must take "any practical means" to restore the waterbody to its previous status.

CONSERVATION REQUIREMENTS

The Directive also provides for the protection of especially sensitive water bodies by designating them Protected Areas. These may include particular sources for water supply, waters valuable for recreation or used by economically important aquatic species and those that are valuable for wildlife for example internationally important wildlife sites and possibly nationally important wildlife sites. These sites may have higher standards applied to them, which will reflect their particular needs.

As a minimum, Special Protection Areas (SPAs) under the Birds Directive, and Special Areas of Conservation (SACs) under the Habitats Directive, will require designation as Protected Areas under the Directive. The Directive also allows for, but does not require, the designation of other areas for the protection of habitats and species, e.g. SSSI's, where the maintenance or improvement of the status of water is an important factor in their protection.

THE RIVER BASIN MANAGEMENT PLANNING CYCLE

The River Basin Management Plan (RBMP) is the key mechanism identified by the Directive for the delivery of environmental objectives. The Plans will characterise the river basin, identify issues, set targets and actions needed to achieve the targets and describe how progress will be monitored. A key aspect of the RBMP will be a Programme of Measures for the achievement "Good Status". The RBMP will be reviewed on a 6-yearly cycle led and published by a competent authority, which is likely to be the Environment Agency, in consultation with stakeholders. Details of the RBMP process are contained in Annex 2.

IMPLEMENTATION TIMETABLE

The implementation timetable is tight (Box 1). In addition to this, there remain significant uncertainties both in agreement of the definitions and scope of the requirements of the Directive. As a result, it is proving difficult to prepare the ground with confidence.

Box 1. Key milestones in the implementation of the Water Framework Directive

- Define basins, appoint Competent Authorities (End 2003)
- Analyse basins, review impact of human activity (End 2004)
- Commence monitoring programmes (End 2006)
- State issues and objectives for RBMP
- Derive Programme of Measures, consult on draft RBMP (End 2008)
- Plan enacted (End 2009 – End 2012)
- Plan reviewed (End 2013 – End 2015)
- Initial deadline for meeting Environmental Objectives (End 2015)

IMPLICATIONS

Whilst the timetable may seem challenging, the Directive will build on a range of initiatives already being undertaken in the UK within the overall framework for Water Resources management. These include: licensing strategies, the development of catchment abstraction management strategies (CAMS), restoring sustainable abstraction programme (RSAP), Habitats Directive and Environment Programme and will complement, be informed by, and inform the region's Water Resources Strategies and water company Water Resources plans (AMP process). Therefore, in the South East we have a good basis from which to go forward, though it is recognised that the likely needs may well impose new pressures on the range of decision makers for whom water resources are of importance.

There are a number of implications for regional planning in the South East:

- The Directive will need to be integrated and inform RPG, RES and other regional strategies. These in turn will need to consider how they can help achieve the objectives of the RBMP's.
- The Directive may provide a more effective and integrated delivery mechanism for delivering our international and national biodiversity commitments.
- The need for better integration of planning and water company asset management plans.
- Environmental indicators in the Sustainable Development Framework for the South East should reflect the outcomes of the Directive and will therefore need to be monitored.
- The success of the Directive potentially cuts across and integrates the full range of planning issues providing a framework for improvements in the environment, biodiversity, water and water supply, planning and regional economic development, social wellbeing and tourism.

LINKING TOPICS

This paper links with a number of related themes being addressed by the Forum:

- Agriculture – water resources and water quality (diffuse pollution)
- Supply and Demand – Asset management plans
- Development and location

WAY FORWARD

The Water Framework Directive will build on the management processes and policies currently in place and implemented by the Environment Agency, water companies and others. The Agency is working closely with DEFRA, SEPA and other European partners on agreeing technical approaches and definitions, and scoping the requirements of RBMP's. Two years on from now, we should expect to see a more transparent and robust approach to the sustainable management of water resources and integrated delivery of sustainable development.

The Forum can play a key role influencing the success of implementation of the Directive in a number of ways:

- Providing a proactive role and vision as a major stakeholder.
- Encouraging competent bodies to engage in the process and delivery of the Directive, especially where it impacts across planning issues.
- Providing a key role for economic and social inclusion, in partnership with environmental interests.
- Supporting economic and social appraisal and identifying issues where there may be disproportionate costs and/or practical infeasibility of options.

- Influencing strategic planning consultation and key bodies to take on board considerations and key planning issues regarding the Directive and implications for the South East.
- Providing a focus for innovation and development of tools and approaches in implementing key elements of the Directive such as:
  - investigating costs and benefits, including opportunities for their redistribution through other schemes (agri-environment schemes, England Rural Development Plan programmes).
  - economic, health and social issues with respect to environmental change.
  - facilitate the linking of actions to funding streams.
- Identifying the benefits to the South East of more sustainable practices and linkages between different initiatives that will reduce overall costs (e.g. sustainable agriculture/agricultural reform).
- Acting as a catalyst for change through the Directives' 'Programme of Measures' in particular:
  - water efficiency/water use minimisation
  - taking action where "Good Status"/ecological potential is not achieved and where there is an integrated outcome and acknowledgement that solutions lie in strategic (rather than water management) planning or where costs may lie with new development (e.g. having to transfer supplies or effluent).
- Leading on the inclusion of an Action Plan within regional economic strategies.
- Becoming a leading UK and European Region in the field of sustainability.

ANNEX 1 – DIRECTIVES TO BE REPEALED AFTER ADOPTION OF THE WATER FRAMEWORK DIRECTIVE

REPEAL IN 2007

Council of the European Communities. Directive concerning the quality of surface waters intended for the abstraction of drinking water (75/440/EEC).

Council Decision 77/795/EEC. Establishing a common procedure for the exchange of information on the quality of surface freshwater in the Community.

Council Directive 79/869/EEC. Directive concerning the methods of measurement and frequencies of sampling and analysis of surface water intended for the abstraction of drinking waters in the Member States.

REPEAL IN 2013

Council of the European Communities. Directive concerning the quality of fresh waters needing protection or improvement in order to support fish life (78/659/EEC).

Council of the European Communities. Directive on the quality required of Shellfish Waters (79/923/EEC).

Council of the European Communities. Directive concerning the protection of groundwater against pollution caused by certain dangerous substances (80/68/EEC).

Council of the European Communities. Directive concerning pollution caused by dangerous substances discharged into the aquatic environment (76/464/EEC).

ANNEX 2 STEPS IN THE PRODUCTION OF THE RIVER BASIN MANAGEMENT PLAN

Characteristics of the River Basin

Characterising surface water bodies

- Identifying the location and boundaries of the surface water bodies.
- Categorising the water bodies into rivers, lakes, transitional waters (estuaries) or coastal waters.
- Identifying which water bodies are to be designated as artificial or heavily modified.
- Characterising water bodies into "types", on the basis of the physical and chemical factors that determine their characteristics, e.g. geology, climate/rainfall, and hence the biological population and structure.
- Determining the reference condition for sites at high ecological status in each "type". This provides a reference against which to judge good ecological status for all other water bodies within the "type".

Groundwater characterisation

- Identifying the location and boundaries of groundwater bodies.
- Pressures to which they are subject.
- General characterisation of the overlying strata from which the groundwater receives its recharge.
- Identification of directly dependant surface water systems.
- Detailing those groundwaters at risk of failing to meet their environmental objectives, e.g. rates of exchange between the groundwater body and the associated surface water systems.

Impacts of human activity

- Identifying the pressures resulting from human activity, such as point/diffuse pollution; demand for, and impact of, abstractions; and land drainage and flood defence works.
- Establishing environmental objectives for each water body.
- Identifying those bodies at risk of failing to meet the objectives set i.e. where "Good Status" will not be met.
- Defining monitoring programmes to determine if objectives are actually being met.

Environmental monitoring data

The Directive requires monitoring programmes to be defined by Member States, and ready for commencement by the end of 2006. The main objectives of the monitoring programmes are:

- To provide a coherent and comprehensive overview of ecological and chemical status.
- To provide a reliable assessment of quantitative status.
- To improve understanding of the relationship between the different elements of ecological quality and to physical/hydromorphological characteristics.
- To permit the classification of water bodies into five classes; high, good, moderate, poor and bad.
- To cover parameters which are indicative of the status of each relevant quality element.

Analysis of the economic usage of water

Economic considerations are an important element of the Directive; Member States are required to take account of the principle of recovery of the costs of water services, and to make judgements about the most cost effective combination of measures in respect of delivering sustainable water use.

Strategic plan for the achievement of "Good Status" or the Programme of Measures

- Publishing RBMP's on a 6-year cycle; the first plan to be published in 2009, and reviewed and updated every 6 years thereafter to take account of further measures needed to meet the Directive's environmental objectives for any particular water body.
- The RBMP will include an integrated Programme of Measures to meet the environmental objectives, in particular that of "good water status", within the basin.
- RBMP's will be subject to a period of public consultation.

WATER RESOURCES, THE RURAL WHITE PAPER AND THE CURRY REPORT

Elaine Hayes, Sussex Wildlife Trust

KEY ISSUES

- Water Resources in the South East are under significant pressure and may well not be able to sustainably meet the demands being exerted on them.
- The White paper and the Curry Report both impact indirectly on this issue.
- The Curry report recognises the importance of sustainable practices in farming and the rural economy.
- The role of farmers as water managers needs to be encouraged and financially supported.
- The full suit of Curry report recommendations need to be formally adopted by government.
- Adaptation of the Common Agricultural Policy (CAP) modulation is essential and can be delivered in the existing framework.
- CAP reform is essential to move support from subsidy to environmental and rural development programmes and the UK must vigorously press for this.
- Climate change scenarios indicate a further shift in predictions; these must now be factored in.

BACKGROUND

The objective of this paper was originally to consider the implications of the Rural White Paper in isolation. The advent of the Curry Report has changed the 'landscape' once again to be comprehensive. This document embraces the findings of both documents.

This paper is not a review of the Rural White Paper or the Curry Report but considers the recommendations from these reports in the context of water resources and the related matters that are within the agreed remit of the Water Resources Forum (WRF).

OVERVIEW OF THE RURAL WHITE PAPER

The government's Rural White Paper was published in November 2000. It was produced in recognition of the issues facing rural communities. The overall aim is "to sustain and enhance the distinctive environment, economy and social fabric of the English countryside for the benefit of all". The vision contains four key objectives:

- To facilitate the development of dynamic, competitive and sustainable economies in the countryside, tackling poverty in rural areas.
- To maintain and stimulate communities and secure access to services which is equitable in all circumstances for those that live or work in the countryside.
- To conserve and enhance rural landscapes and the diversity and abundance of wildlife.
- To increase opportunities for people to get enjoyment from the countryside.

WATER RESOURCES, ABSTRACTION AND CLIMATE CHANGE IN THE SOUTH EAST

Introduction

In order to ensure that all parties understand the context of this paper this section considers the findings of the "Water Resources for the Future", Strategies for Southern and Thames Regions, published by the Environment Agency in March 2001. These comprehensive documents consider supply and demand scenarios for a broad range of activities. This paper draws particularly on the Southern Region strategy, which covers a larger part of the South East GOSE/SEEDA/Regional Assembly region.

Sympathetic land management of wetlands allows wildlife to flourish

Climate change impacts

Changes in water availability are already evident through the impact of climate change – the UK Climate Impacts Programme (UKCIP). The latest scenario has just been released in April 2002. It was only available on the day that this paper was completed so detailed study was not possible, but it shows a far worse position for the South East compared to the 1998 scenario. For 1998 ("Rising to the Challenge - Impacts of Climate Change in the South East in the 21st Century") the prediction for rainfall in the South East by the 2080s is winter rainfall increased by up to 22% and a decrease in summer rainfall of up to 23%. Summer temperature was forecast to increase between 1.2-3.4ºC. The 2002 scenarios are for an increase in winter rainfall of up to 30% and a decrease in summer rainfall of up to 50%. Summer temperature will increase 2-4.5ºC. The 1998 scenario suggested that spring and autumn will be slightly wetter than present, but the new scenario suggests they will be drier. Further, the 2002 prediction is that soil moisture will be reduced in the summer and autumn by up to 40% or more.

The 1998 scenarios presented significant challenges for ensuring that water demand is managed sustainably. The 2002 scenario will have even more significant implications. Direct abstractions will be less secure in summer months and it is these scenarios that must inform our thinking on future sustainable rural economies.

Climate change will have severe implications on the ability of the UK to deliver progress towards Biodiversity Action Plan (BAP) targets. Conversely, action to deliver BAP targets through increasing habitat size connectivity and appropriate land management in the floodplain will deliver a more robust environment better able to adapt to climate change.

Abstraction

The Environment Agency has undertaken extensive work and produced comprehensive proposals to cope with the growing demand for water in the South East against a very challenging situation in one of the driest parts of the country with a major and growing demand for water. Whilst the strategies are very comprehensive and provide a clear plan, there are significant uncertainties and concerns in relation to water resources and the environment.

- Public water supply accounts for the majority of abstractions in the South East; supplies must be available to satisfy peak period needs as well as average annual needs in dry years. This means that in order to ensure minimum harm to the environment all demand modelling should be based on worst case scenarios for water availability.

- The Strategies are based on the 1998 climate change predictions and will need updating in relation to the 2002 scenarios which predict a worse summer situation from the point of view of demand.

- The whole of the EA Strategies will need to be implemented if demand and the 1998 climate change forecasts are to be met, but many of the proposals need investigation, including their environmental impacts and some are controversial and the 2002 climate change forecasts need incorporating and may not proceed.

- The whole of the EA Strategies will need to be implemented if demand and the 1998 climate change forecasts are to be met, but many of the proposals need investigation, including their environmental impacts and some are controversial and the 2002 climate change forecasts need incorporating and may not proceed.

- The Southern Strategy (and presumably the relevant part of the Thames strategy) is based on current Regional Planning Guidance (RPG) growth (This is for the current RPG covering more than the GOSE region) of 39,000 per annum. In spite of the change to 'plan, monitor and manage' in place of predict and provide' Regional Planning Guidance says that this may be expected to rise to 43,000 per annum. This is not catered for. The Southern Strategy notes (P47) that 'there are locations in Southern Region where it would be inadvisable to develop too quickly or too extensively until water resource and environmental impacts are understood and water supply provision is properly planned'.

- Catchment Abstraction Management Strategies (CAMS) are not complete, so essential data is not yet in place (and they consider only rivers, not wetland needs).

- EA Southern is still working on a figure for the water budget that delivers environmental protection and restoring past damage. The EA strategy notes that as knowledge advances so might the expected level of environmental protection. The implications of the Water Framework Directive will also have to be incorporated in planning.

- Abstraction strategies need to consider the effect of abstraction on biodiversity. Strategies should be integrated with wider land management, flood defence and land drainage strategies so that best use can be made of hydrological systems to the benefit of water provision, biodiversity and agriculture.

Finally, what happens beyond the Strategy periods? Many options will have been used and demand/ development will not stop. This needs to be considered as a priority. Any strategy for securing rural sustainability needs to ensure that there is sufficient buffering capacity to minimise the risk of harm to the environment.

THE RURAL WHITE PAPER

Rural economies

Part 2 of the report considers the rural economy in its broadest sense. The paper considers the change in fortunes of rural towns and the decline in agriculture and other basic rural businesses. The rural economy is clearly in need of regeneration, but this has to be structured in a way that considers the sensitivity of the

rural setting. Priority should be given to businesses that require a rural location and/or are linked to local product-based industries.

Further urban development will place increasing pressures on the water resources rural areas and most of the wetlands vulnerable to over-abstraction are in rural areas. The paper does not consider incentives to consumers to reduce water consumption whilst including safeguards to ensure that those on low incomes have sufficient for essential needs. Waterways-led regeneration through the restoration of inland canal systems may be one way of enhancing infrastructure but the environmental impact of such schemes must be carefully considered.

Agriculture

This section covers the general nature of the problem that needs tackling as well as what the White Paper does or does not cover. The nature of the problems is not repeated in the section on the Curry report.

Background and reform of farming

It is important to consider that this report predated the outbreak of Foot and Mouth in 2001. Farming has been considered to be "in crisis" for the past 5 years. Making a living from farming has become increasingly difficult.

The inadequate and outdated CAP has only served to reinforce the problems with subsidies focused on production efficiency rather than sustainable agriculture. Offering opportunities for diversification is one means of re-vitalising the rural economy, but what is fundamental is that there remains the need to ensure a sustainable agriculture in the UK.

Agricultural policy, particularly the CAP has caused major losses of landscape and wildlife. This is not the fault of individual farmers. The farming industry delivering sustainable environmental management is essential for the management of the countryside and its wildlife. Intensive farming practices still exert a significant demand on water resources.

A key tenet of the revitalisation of agriculture and its delivery of environmental benefits has to be reform of the CAP; this is not within our gift as a nation and will require a fundamental change in land management funding through the EU. This is a long-term process but it is important to consider what can be done within the scope of the existing framework. This is considered further in the context of the Curry Report.

Maintaining high water tables in wetlands should be a priority in water resource planning

Agriculture, wildlife, and climate change

Climate change will mean major impacts for agriculture and its relationship with water resources. Under climate change, particularly the new scenarios with up to 40% reduction in soil moisture forecast, agriculture will exert heavier demands on water resources. This will have to be managed through changed irrigation systems, summer storage of winter rainfall and probably changed cropping.

Wetland habitats will become far more vulnerable with summer drying of wetlands with the potential loss of vulnerable species and habitats. At the moment maintaining high water tables in wetlands receives much less priority in water resource assessment and planning than do rivers.

Another factor that climate change will exacerbate is that of diffuse pollution affecting wetland habitats, which is already a major problem. With drier summers pollution will be more concentrated in wetland habitats. But wetter and stormier winter is likely to mean more leaching and runoff of silts.

Agriculture through input of phosphates, nitrates and silts, is currently a major source of diffuse pollution. The Environment Agency in 2001 noted that phosphate from manure and fertiliser leaches into rivers and lakes and together with phosphate in sediment from soil erosion, causes excessive algal growth in up to 200 freshwaters each year. Many more non-open water habitats, such as fens and bogs, are also affected. Much work needs to be done to ensure that a revitalised farming industry is able to deal effectively with the risks it poses to the water environment. Other areas of agriculture, such as fish farming, may exert a significant demand where there are also implications for water quality. These major implications of climate change and water resources are hardly touched on in the White Paper. It notes the problems of diffuse pollution, but only comments on tackling it in relation to river quality objectives and nitrate vulnerable zones.

Agriculture and managing landscapes and wildlife habitats

The White Paper recognises the decline in biodiversity that has been ongoing for over forty years. A number of schemes have been developed to encourage landowners to farm and manage land in a more environmentally friendly way. In particular, it covers the then recent creation of the Rural Development Regulation under Agenda 2000 and increased spending on agri-environment schemes through modulation. This is on an increasing scale up to 4.5% by 2006. The EU permits up to 20% but funding has to be matched by the UK. As covered under the Curry report below, whilst Agenda 2000 was a major step forward, to tackle the major problems relating to the environment and rural development the White Paper did not go far enough.

Flood defence: a further role for landowners

One aspect of land management that has been only considered in part in this report is the consideration

that should be given to use of farmed land for effective flood management. The vital connection between catchment management and urban flooding was noted in the White Paper, but only provided ideas to be considered. Climate change, agricultural drainage and management of floodplains, urbanisation and the spread of non-porous areas and flood plain have combined to bring about some of the worst flooding seen in the UK this century. Funding for flood defence should consider not only engineered solutions but also more natural solutions such as managing floodplains as grazed wetland habitats that will retain and slowly release water and through the sympathetic agricultural management of wider catchments. Management or re-creation of wetlands in this way will not only provide a more sustainable solution to flood management, it may also enable the delivery of progress towards wetland BAP targets. The flood defence budget should contribute towards this, but where there is environmental benefit beyond this the agri-environment schemes should be contributing where necessary.

THE CURRY REPORT ON THE FUTURE OF FARMING AND FOOD

Overview and CAP reform

This excellent report was produced in light of the Foot and Mouth outbreak of 2001 that caused significant harm to the farming industry. It considers food supply and delivery, education and means of providing direct help to the farming industry. The key recommendations of the Curry Report relate to direct practical help for the farming industry but also considers many of the points pertaining to water resource management.

The report proposes fundamental reform of the CAP to progressively transfer resources towards public goods the public wants including sustainable rural social and environmental objectives rather than subsidising overproduction. The report notes that the government should make a clear statement of its support for farming as a sustainer of the rural environment as well as food producer and properly reward the industry for its role in managing the countryside.

Rural Economies

The report sets out a wide series of measures to revitalise the rural economy through a more diversified food, farming and related rural tourism. The proposals set out for CAP reform for increased modulation include widening the delivery of rural social and economic benefits.

Agri-environment schemes, water resources and pollution.

The report notes that there are already in place significant EU Directives on water, waste, nitrates, and integrated pollution control that will require significant changes to farming practice over the next 5 to 10 years. The Commission was surprised and disappointed that more work has not been done to understand the challenges for the industry and help. It recommends the Government develop and publish a strategy for implementing the forthcoming environmental legislation, including a regulatory impact assessment based on cost-benefit analysis covering the impact on farms.

The Curry Report proposes that in the meanwhile modulation should be increased to 10% from 2004 and 20% in 2006-7, if CAP reform is not delivered by then. This has implications for the Government providing the matching funding.

Amongst the proposals made for this is a new ‘broad and shallow’ scheme for quality management of the environmental and other resources of the wider countryside. The current Agri-environment schemes would be simplified and modified to become an upper tier for more detailed management of areas.

The ‘broad and shallow scheme’ would be based on a whole farm plan and audit. This should cover natural resource protection as well as conservation issues, including examining the farm against existing and forthcoming legislative requirements, to help farmers identify and plan for the effects of the EU environmental directives. The report hopes that the information will help identify where help and support is needed for the agencies.

Amongst the benefits noted for such a ‘broad and shallow’ scheme is the ability to develop buffer strips alongside watercourses to reduce diffuse pollution and, through an increase in non-cropped land, increase water retention. An English Nature report just published and part funded by Environment Agency suggests that a wide package of measures will be needed to tackle diffuse pollution, with the need to tailor many to the particular farm. The ‘broad and shallow’ scheme and farm audit and plan could be a real help, but other funded measures will also be needed.

Significantly, the report identifies clearly the role of farmers as water managers in the future. Future environment schemes and, where appropriate, woodland schemes should include water management with funding to be given from flood defence budgets.

In terms of water resources in a holistic sense an improved farming industry should benefit the environment as a whole providing it is structured appropriately. Any increase in farming is likely to increase the demand for water resources for irrigation etc. The extent of this increase is difficult to quantify.

Implementing the report as a whole

The report makes it clear that the measures proposed comprise a complete package and must be delivered as a whole if it is to deliver what is needed. The South East Rural Affairs Forum, set up to advise government through the National Rural Affairs Forum on rural matters confirmed its view that this is essential.

However, the government’s position is currently unclear. DEFRA are currently consulting on ‘Sustainable Food and Farming - Working Together’. This assumes that some of the Curry report will be implemented, but also re-runs what the Food and Farming Commission covered on a range of questions including the need for a ‘broad and shallow scheme’.

Rural land managers are essential partners in managing the water environment

This suggests that the report is not accepted in its entirety. The England Rural Affairs Forum is critical of re-running what the Commission had consulted on so comprehensively.

CONCLUSIONS

The two reports consider broad areas of rural development. The Rural White Paper is the widest, the Curry Report concentrating on farming and food, albeit in its widest sense. The longer-term strategy for rural life in the White Paper remains ill defined, thus making quantification of the impacts on water resources estimates at best and sustainable development issues (which embrace water resources) are not fully integrated.

Climate change will have profound implications for water resources and many aspects of rural areas but is inadequately covered in both reports. The latest scenarios show the impacts of climate change will be deeper than previously thought. Climate change will exacerbate the current problems of diffuse pollution and the drying of wetlands. The White Paper does not cover this. The 'broad and shallow' scheme proposed in the Curry Report will to some extent help tackle this, but more action will be needed.

Water resources are under significant pressure and there is insufficient assurance and data currently to ensure that we can protect the environment whilst also delivering the proposals for growing demand.

The Rural White Paper reflected the increase in funding of agri-environment schemes, but the Curry Report proposes necessary major changes to funding these and wider environmental and social objectives. The major shift in modulation recommended in the Curry Report coupled with a bigger change in the longer-term in CAP, plus the suite of proposals it proposes including funding of a 'broad and shallow' environmental scheme, whole farm audits and plans and funding for management of flood plains and catchments, will be positive for water resources.

WATER RESOURCES AND SPATIAL PLANNING

Mike Gwilliam, South East England Regional Assembly

SUMMARY

Water resources are a key issue for regional spatial planning. The Regional Assembly, as Regional Planning Body for the South East of England, needs to be well informed of the current water resource situation, and of future water resources availability.

To this end, the Assembly has established a Natural Resources and Climate Change Advisory Group, chaired by the Environment Agency, to advise it on water related issues in implementing and reviewing Regional Planning Guidance, and is a member of the Regional Water Forum.

Key issues for the Regional Assembly, and for spatial planning generally, include:

- Water efficiency – encourage greater efficiency of use and reduction of waste in existing and new development;
- Spatial and temporal availability and sensitivity of water resources:
  - identify whether water resource availability may pose a significant constraint to new development now, or in the future, and whether this can be overcome through sustainable resource.

INTRODUCTION

The recently published climate change scenarios (UKCIP02) suggest that the South East could experience some of the most severe effects of climate change, including hotter and drier summers - the times when water demand is at its peak.

The need to balance the growing demand for water with the protection of the environment therefore poses a challenge for strategic planning in the South East. The "achievement of sustainable water resources management" is also one of the key objectives of the region's Sustainable Development Framework.

As Regional Planning Body, the Regional Assembly needs to be well informed of water management issues and the implications for development and planning. We are already working with the Environment Agency and the Regional Water Forum to ensure that Regional Planning Guidance (RPG) is implemented in a sustainable manner, and to inform the review of regional planning policy.

This will require further investigation of the availability of water resources now and in the future, including identification of areas where water resource availability may be a significant constraint to development, and measures to overcome or mitigate the impact of development, together with assessment and agreement on the need for, timing, and location, of development of new water resources. Overall, there is a need to focus attention on overall water use and wastage and their collective reduction.

WATER RESOURCES OVERVIEW

The recently published Environment Agency Water Resources Strategies provide detailed examination and commentary about the current and future pressures upon the water dependant environment and the supply/demand balance. These draw on RPG9 housing provision, Water Company plans and take account of climate change forecasts and the need to protect the environment, covering the period to 2025.

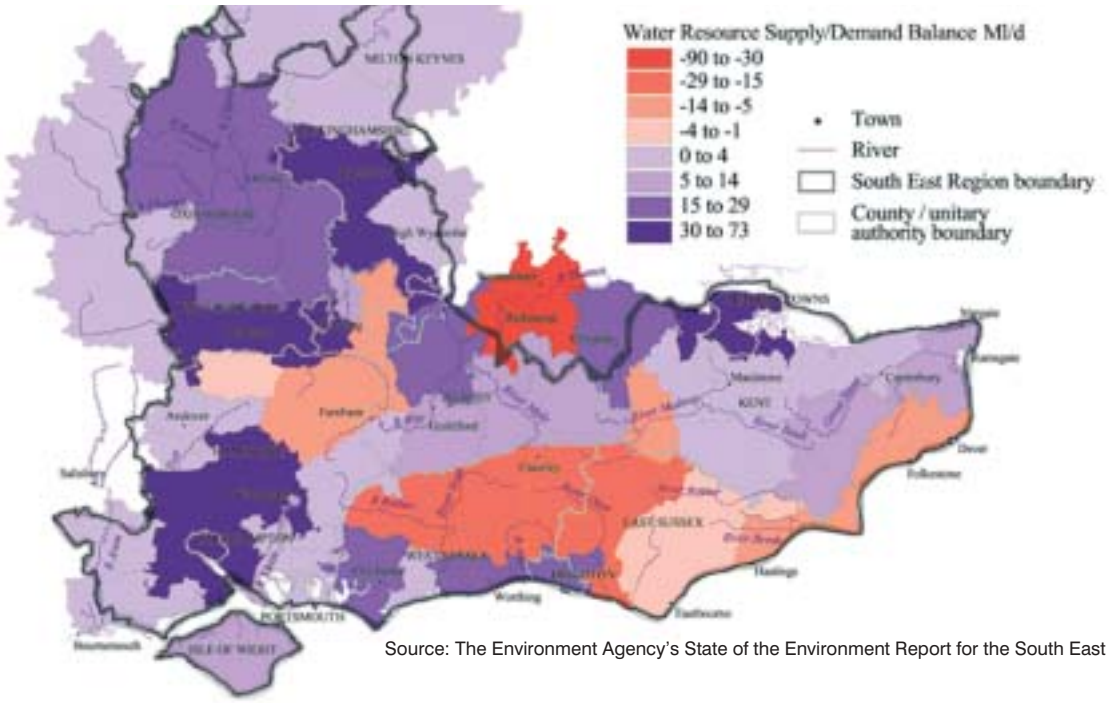
In summary, the Strategies promote a "twin track" approach whereby water use is managed efficiently through demand management, water efficiency and leakage control while bringing forward timely proposals for new sustainable resource development. The Regional Assembly very much agrees with this approach.

SUMMARY OF ENVIRONMENT AGENCY REGIONAL WATER RESOURCES STRATEGY RECOMMENDATIONS

For public water supply, by 2010

The Agency expects considerable water savings and significant resource developments:

- Demand management options including metering and water efficiency measures. The Agency expects continued water savings to be maintained through active leakage control;
- Enhancement of local sources (water treatment works improvements and conjunctive-use developments);
- Further integration of the existing water supply infrastructure;
- Take up of bulk transfers (including within the existing arrangements at Grafham, and those resulting from the "Water Resources in the South East" study);
- Increased transfer between Bewl and Darwell reservoirs and preparation for enlargement of one of these reservoirs;
- Enhance groundwater developments for example through artificial recharge and recovery of the London Basin groundwater;
- Determine the best use of Swanscombe quarry.



Source: The Environment Agency's State of the Environment Report for the South East (2000)

FOR PUBLIC WATER SUPPLY, BY 2025

The Agency expects further water savings and resource developments:

- Demand Management options including metering, leakage control and water efficiency;
- Enlargement of one or more existing reservoirs (Darwell and/or Bewl);
- Bulk transfers, from the Midlands canal network or from the Severn to Thames;
- Local groundwater developments;
- Across Environment Agency Southern Region, further water company system integration, optimisation and resource sharing.

The Environment Agency advises that there will be sufficient water available to satisfy statutory duties to supply customers and protect the environment if, and only if, the Strategies are implemented in their entirety. In other words, there is a danger that demand for water could exceed supplies if the Strategies are not implemented in full. Delivery of these Strategies will depend on a range of actors, including the Regional Assembly and local planning authorities.

As with other issues, the influence of London cannot be ignored. The Thames Water supply area covers Berkshire, the southern part of Buckinghamshire, Oxfordshire and London. The Agency advises that if leakage in London could be significantly reduced, long-term water resource problems within the Thames Water supply area could be much diminished. Depending on the success of demand management and leakage control, existing resources in this area should prove adequate to meet known demands up to 2010. However, new resources will need to be developed and/or substantial reductions in leakage in London achieved, if the demands for water are not to reach supply limits by 2016.

In the rest of the Region, North and East Sussex and East Kent are identified as areas where the water resource supply/demand balance may be critical and where increases in demand may have environmental impacts.

REGIONAL SPATIAL PLANNING

The Regional Assembly is the Regional Planning Body for the South East of England, responsible for implementation and review of Regional Planning Guidance. The Assembly intends to commence review of RPG9 in 2003, with the time horizon of the revised regional guidance extending to 2026.

Regional Planning Guidance (RPG9) sets out a spatial development strategy for the Region. It includes policies for areas for potential growth and regeneration, and for provision and distribution of housing. It also addresses water resources and quality in a specific policy recognising that "water issues potentially pose certain limits to growth in particular areas".

RPG9 Key Principles and Core Strategy:

- Urban renaissance and concentration of development – focusing development in existing urban areas and encouraging the re-use of previously developed land and buildings, rather than development of new settlements on greenfield land;
- Thames Gateway – identified as a regional and national regeneration priority;
- Priority Areas for Regeneration – including parts of the Sussex, Hampshire and Kent coasts and the former Kent coalfields;

- Western Policy Area – economically buoyant area to the west of London including parts of Berkshire, Buckinghamshire, Oxfordshire, Hampshire and Surrey;
- Potential Growth Areas – Milton Keynes and Ashford.

RPG9 Key Policies:

- Policy INF2 – concerns water resources and quality, including encouragement of water efficiency and planning for sustainable provision of water services and timely investment in treatment infrastructure to maintain water quality;
- Policy H2 – sets out housing provision on a County basis, recommending provision for 28,050 dwellings per annum in the Region, initially to 2006 with possible increase in rate thereafter.

Implementation of RPG, particularly the scale and type of housing provision, is a significant issue as more than 80% of all water is consumed through domestic use. Growth in personal (per capita) consumption is forecast to fall slightly to 2005 and then grow steadily by up to 6.5% by 2025. Per capita consumption of water is higher in low and especially single occupancy households, which is the type of household which is currently growing most quickly - a trend which is forecast to continue.

Both for the implementation of RPG9, and for the review of regional guidance, the Regional Assembly will need clear advice on the degree of constraint water resource availability will place on development in different parts of the region in different timescales, measures that we should promote to overcome or mitigate effects of development on water resources, and the necessary timetables for major new water resource development.

The Environment Agency Water Resource Strategies identify key pressure areas for water supply provision and potential resource developments:

Oxfordshire

Supplies are linked to the issue of leakage control in London. A major new resource may be required which would be contentious and would require a major lead-time.

Berkshire

Shortfalls in parts of the west of the county in the medium-term will require the development of new bulk transfer arrangements from areas of surplus elsewhere in the county.

Kent and Sussex

Shortfalls in the short to medium-term will require the bulk transfer of water between companies. Raising Darwell Reservoir may be needed to meet projected demand. Growth at Ashford, but also possibly in Thanet and North Kent, may bring forward the need for a new strategic resource.

We are currently working with the Environment Agency, primarily through our Natural Resources and Climate Change Advisory Group (co-chaired by the Regional Directors of the Environment Agency Thames and Southern Regions) to develop a clearer understanding of all water resource issues and identification of actions which we need to progress.

KEY ISSUES

The supply of water to new development in the South East Region is going to be a critical issue in the implementation and review of Regional Planning Guidance. The Water Resources Strategies of the Environment Agency set out a series of measures for securing such a supply. However, if it proves not possible to implement all these measures the possibility of shortfalls in supplies will remain. Given potential supply problems in parts of the region, the need for more efficient use of existing water resources and changes in consumption patterns will be of paramount importance.

It is difficult to justify a case against specific developments purely on water resources grounds. Developments can be supplied with water brought in from some distance away – especially as companies have a statutory duty to provide supplies. However, this could mean considerable costs, both financial and environmental.

In implementing and reviewing RPG, the Regional Assembly needs up-to-date information and advice regarding:

- How critical the demand/supply balance for water resources is in different parts of the region over different time frames, and the need for more specific sub-regional policies;
- The "sensitivity" of water resource availability (to meet public water supply and environmental needs) to different scales and types of development in different parts of the region over different time frames;
- The need for resource enhancements to precede new major and more piecemeal developments in different parts of the region;
- The need for the development of major new water resources, such as reservoirs, and the timing for this requirement so as to ensure that these are planned for well in advance and that environmental implications can be fully addressed;
- How we can encourage design and location of new development to overcome or mitigate potential impacts on water resources, including installation of water efficient devices and other demand management measures, for example through more demanding building regulations, planning policies and design guidance;
- How to encourage greater water efficiency within the existing building stock.

We recognise that often there will not be straightforward answers to these questions, given the range of factors which need to be considered and the degree of uncertainty over future trends. It is also

important to remember that water resources is one of a number of factors which planning authorities and the Regional Assembly have to appraise in coming to an overall judgement about planning priorities and principles. However we will continue to work with the Environment Agency and the Regional Water Forum to identify what role we can most effectively play and together how we can make progress.

In addition, the implications of the EU Water Framework Directive on spatial planning, particularly the identification of "anthropogenic" effects on catchments and the relationship between River Basin Management Plans and development plans, as well as RPG, will need to be considered.

CONCLUSION

The need to become more efficient in the way we use all natural resources is a central tenet of sustainable development. With regard to water resources, this is particularly important in the South East where water use is highest and where the latest climate change impact scenarios suggest that patterns of rainfall, and resource availability, may alter significantly in the future.

The twin track approach of continuing to encourage increasing efficiency in existing and new developments, whilst planning well ahead for new water resources, is one that the Assembly endorses and will contribute towards as regional planning body.

To enable us to play as full a part as possible in implementation and review of regional planning guidance, we will require assistance and advice from the Regional Water Forum and its members, in particular with regard to:

- Water efficiency – to identify how the Assembly can best contribute to encouraging greater efficiency of use and reducing wastage of water in existing and new development;
- Spatial and temporal availability and sensitivity of water resources – to identify whether water resource availability may pose a significant constraint to development now or in the future, whether sustainable resource developments or design innovations can overcome this, and how this may affect implementation and review of RPG;
- New water resource developments – to ensure that the development of new resources, including major new resources and those to service new developments, are planned for well in advance and incorporate sustainability considerations.

Ensuring adequate water resources is essential for planning regional development

WATER AND CLIMATE CHANGE IN THE SOUTH EAST

John Biron, formerly Country Land and Business Association

Climate change has long been seen as an important issue but until now, land and rural-based businesses have largely taken a back seat, although they are literally on the "front-line" of the issue.

As well as relying heavily on natural resources like water and soil, whose functions are dependent on the climate, rural businesses also control a significant percentage of atmospheric greenhouse gases (an increase in greenhouse gases, such as carbon dioxide, methane and nitrous oxide exacerbates climate change). For example, atmospheric carbon dioxide can be stored in forests and soil, and renewable energy crops provide carbon-neutral energy. Livestock emit methane and over-use of nitrogen fertilisers can lead to nitrous oxide emissions.

Land management practices can play an important role in storing carbon - both in plants and soil

It was becoming increasingly clear to us that climate change would provide many opportunities, and also challenges, to rural businesses in the future and it was therefore timely for the Country Land and Business Association (CLA) to raise the rural profile in the climate change debate. Against this background, in November 2001, a working group was set up within the CLA to consider climate change in the context of land and rural businesses. It was the first attempt, as far as we were aware, to examine climate change from the perspective of owners and managers of rural land and businesses in the UK.

The group's scientific advisor was David Viner, a leading climatologist at the University of East Anglia's Climatic Research Centre. We began by setting out the objectives of the paper, which were to review the opportunities and threats arising from climate change for land managers and rural businesses, to examine potential adaptation and mitigation strategies that they could take, and to propose public CLA policy changes as necessary. We reviewed the scientific evidence and assessed the impacts that climate change could have on the rural economy.

The science shows that in the UK temperature is projected to rise by up to 3ºC by the 2050s, with the likelihood of milder winters and higher summer temperatures. Winters are expected to get up to 20% wetter by the 2050s, with a higher number of intense winter rainfall events. Summers are expected to become up to 20% drier by the 2050s, with an increase in summer droughts to nine in 10 years. Sea-level is expected to rise by up to 1 metre in the South East of England and up to 70 cm in the North West of England by the 2050s.

These expected climatic changes will have a huge impact on rural areas. In our paper "Climate Change and the Rural Economy" we identify the impacts of future climates on water resources and quality, soil, arable and livestock farming, energy, forestry, rural businesses, riverine and sea flooding and biodiversity. We identify some ways of mitigating and adapting to the impacts and recommend 102 policy responses required to action them.

The report targets its 102 recommendations at the main Government departments and organisations in England and Wales which the CLA believes should drive forward the climate change agenda, detailing what structures and funding are needed to enable land managers and rural businesses to deliver potential climate change solutions.

As well as presenting our policy statement to UK MPs, peers, government officials and interested organisations, we also took it to the world climate change talks, COP 6, in Bonn, where we were able to distribute it to over 150 countries and global organisations and hand it personally to Michael Meacher, UK Minster of State for the Environment, and Margaret Beckett, UK Secretary of State for Environment, Food and Rural Affairs. It was given an exclusive article in the Financial Times, featured in the Telegraph, and was promoted on radio and at conferences. The document is available on the web at www.cla.org.uk/climatechange

SOME RECOMMENDATIONS FROM OUR DOCUMENT ARE AS FOLLOWS:

- We expect water resources to become more variable and uncertain. This will impact heavily on those who irrigate. We recommend that the expansion of winter water storage for summer use is encouraged by amending the Reservoirs Act to exclude reservoirs that pose no risk to public safety, and by encouraging local authorities to consider planning proposals for reservoirs more positively.
- As well as being a growth medium for plants, soil also stores carbon in the form of organic matter, which can play a part in reducing atmospheric carbon dioxide. We recommend incentives for soil management practices that store carbon, for example through agri-environment schemes.
- There is huge potential for arable farming to adapt to climate change by growing new crops - like sunflowers and durum wheat and by growing crops at higher altitudes. Livestock are more likely to experience heat stress, which has been linked to a reduction in fertility and growth rates. We ask for better, more targeted advice for arable and livestock farmers to help them adapt in the future.
- There is also much that farmers can do to reduce greenhouse gases. We recommend increased promotion of nutrient budgeting to reduce nitrous oxide emissions, and research on livestock feed to reduce methane emissions.

Livestock and grazing land will be affected by climate change

- There is tremendous potential to grow carbon neutral renewable energy crops, such as elephant grass and willow. We push for an increased target for producing energy from renewables and more encouragement for cultivation of biomass.
- Forestry can have a beneficial effect on climate change by storing carbon in timber. We advocate support for foresters to store carbon, and also to encourage the growth of quality timber which can be used as a substitute for other material, eg steel.
- Climate change will not only affect land-based businesses but also a wide range of other rural businesses, including tourism and fisheries. It is important for the rural economy that these businesses are also recognised as needing assistance to adapt. We recommend investing in communication technologies in rural areas to reduce travel needs and increased support for on and off-farm diversification under rural development plans.
- Riverine and coastal flooding is expected to increase over the next century. We recommend developing incentives for managed realignment of coastal land and managed re-creation of floodplains as a flooding control tool. There has never been a better time to do this. There is a real desire from land managers to take up any incentives that might be offered as their agricultural activities are not making sufficient returns.
- The pressure of climate change will cause degradation of some habitats, and consequently species, and the creation of others. We recommend that the land area under conservation agreements should be increased to the whole countryside, to provide better opportunities for localised species to adapt to change.

We believe that this document is a timely input by the rural sector into the climate change debate. It shows the many areas on which climate change is expected to impact. We have recommended a series of practical policy changes that can be implemented in partnership with the countryside. We firmly believe that given the right policy framework, rural businesses can start to play a significant role in the reduction of greenhouse gases and other adverse environmental impacts, and ensure we have a vibrant living and working countryside for generations to come.

River corridors offer potential as a flooding control tool

SUMMARY OF ISSUES FROM THE QUESTION AND ANSWER SESSIONS AND OPEN FORUM

The formal presentations were followed by question and answer sessions, and the Conference ended with an open forum. This enabled delegates to engage with the speakers over what the priority issues for the Forum should be, and explore the ways in which the Forum can seek to add value. While the discussions were extremely wide-ranging, a number of common themes emerged which have been considered by the Executive in developing and managing a forward Work Plan for the Forum. A summary of the main points is set out below.

TOPICS THAT THE FORUM SHOULD ADDRESS:

Demand and supply management

Since a high percentage of water consumed in the South East is for domestic use, this was identified as a priority focus for demand management initiatives. Delegates cited housing projections and a rising per capita demand for water in the region as major issues. Speakers pointed out that although there are technical solutions such as metering and water recycling systems, customers and developers have proved reluctant to adopt conservation measures and have resisted the associated costs. Views were expressed that awareness must be raised, reinforced through requirements in the planning system.

Further discussion centred on the options for water transfer around the country to moderate imbalances. Although this is technically feasible, questions were raised about the economic and environmental considerations of transferring water of a different chemical quality into areas experiencing shortages. High importance was placed on wise use of water before considering transfers.

Strategic planning

Economic growth in the region is an objective of national and regional government, and while development may also be encouraged in other regions, pressure on South East England is unlikely to diminish. Questions and answers highlighted the risks and difficulty of making firm long-term decisions based on predictions of population and housing need, which may be subject to significant change over time. Speakers explored the possibility of retaining some flexibility in the system through temporary patterns of land use to meet short-term needs.

Planning timeframes

Although many water issues require long-term thinking to achieve sustainable solutions, planning and legislative processes often operate on short-term horizons, with the potential to prejudice future options. A further complication is that timeframes vary between different processes, e.g. Regional Planning Guidance and water company Asset Management Plans. There is a need to ensure that long-term issues are widely understood and accepted so that different planning processes do not compromise each other.

Holistic approaches

Water resource and quality issues are frequently interlinked. For instance, built development and land management practices affect run-off, infiltration and soil erosion, with consequent impacts including flood risk and aquifer recharge. There is considerable potential to alleviate problems and derive economic, social and environmental benefits by taking an integrated and holistic approach to water management at a catchment scale. Restructuring of incentives to landowners could play an important role in encouraging integrated land management practices.

Coordination between key players

While there can be strength in constructive tension between key players, there is a clear need to achieve better coordination of effort and joined up thinking across the different agencies.

WAYS IN WHICH THE FORUM SHOULD SEEK TO OPERATE:

Action focused

There was a strong view from delegates that the Forum should not become simply a talking shop, but that it should develop a clear programme of work that will bring about beneficial change.

Awareness and education

As a body representing major stakeholders, the Forum has a clear role in raising levels of understanding on water issues amongst organisations and the general public, e.g. the need for water conservation measures and changes in consumer behaviour. Key issues must be communicated clearly in a transparent way, and engaging with local communities and organisations can be an effective route.

Co-ordination of views and initiatives

There are many different stakeholders operating independently in the water environment, and the Forum will be well placed to fulfil a coordinating and streamlining role. This could include establishing common ground where it is possible to speak with a single voice, identifying and acknowledging tensions, bringing disparate groups together and brokering solutions.

Developing and promoting best practice

The Forum should be seen to practice what it preaches and become a champion of best practice, both in supporting innovative projects and approaches, and in disseminating knowledge.

Influencing policy makers

The fundamental water issues need to be addressed in national and regional strategic policies. Because of the knowledge and experience that the Forum will have at its disposal, it is well placed to offer sound advice and solutions to policy makers. The challenge for the Forum is to find ways in which it can focus its resources to fulfil this role.

REPRESENTED ORGANISATIONS

EXECUTIVE COMMITTEE

Council for the Protection of Rural England (CPRE)
Country Landowners and Business Association (CLA)
English Nature
Environment Agency
Mid Kent Water plc
Royal Holloway Institute for Environmental Research (RHIER)
South East England Development Agency (SEEDA)
South East England Regional Assembly
Southern Water
The Wildlife Trusts

MEMBER ORGANISATIONS

Ashford Borough Council
Association of Councils of the Thames Valley Region (ACTVaR)
B&Q
BAA Gatwick
BAA Heathrow
BABTIE Group
BAE Systems plc
Barratt South London
Beacon Press
Bellway South East
Berkshire Joint Strategic Planning Unit
Blake Lapthorn Solicitors
Brighton & Hove City Council
British Chambers of Commerce
Buckinghamshire County Council
Buckinghamshire Economic Partnership
Business Link Kent
Cap Gemini plc
Chiltern District Council
Confederation of British Industry (CBI)
Countryside Agency
Crawley Borough Council
Dartford Borough Council
Department of Trade and Industry (DTI)
DHSC South: SE Public Health Group
East Sussex County Council
Eastbourne Borough Council
Eastleigh Borough Council
Ecosys Environmental Management & Education
Enviros
Envirowise
Federation of Small Businesses (FSB)
Folkestone & Dover Water Services Ltd
Friends of the Earth
GlaxoSmithKline
Government Office of the South East (GOSE)
Guildford Borough Council
Guildford Environmental Forum
Hampshire & Isle of Wight Business Environment Forum
Hampshire and Isle of Wight Local Authorities
Hampshire County Council
Hartlake Developments Ltd
Horsham District Council
Institute of Directors (IOD)
Isle of Wight Council
Kent County Council
Langmead Farms
Medway Council
Mole Valley District Council
Natural Step
Office of Water Services (OFWAT)
Oxford Brookes University
Oxfordshire County Council
Oxfordshire Economic Partnership (OEP)
Peter E. Firth and Company
PHA Group
Portsmouth Water Ltd
R.J. Smith Environmental Historian
Ramblers' Association
Reigate & Banstead Borough Council
Royal Society for the Protection of Birds (RSPB)
Shepway Chamber of Commerce & Industry
Society of British Aerospace Companies Ltd
Society of Maritime Industries
Sony United Kingdom Ltd
South East Climate Change Partnership
South East Forum for Sustainability (SEFS)
South East Regional Technical Advisory Body for Waste (SERTAB)
South East Water
Southampton City Council
Surrey County Council
Sussex Enterprise
Sussex Local Flood Defence Committee
Sutton & East Surrey Water plc
Symonds Group
Tandridge District Council
Telecommunications Industry Association
Thames Valley Chamber of Commerce
Thames Valley Economic Partnership
Thames Water
Tomorrow's Technologies
Tunbridge Wells Borough Council
Unilever Bestfoods UK
Univerisity of Oxford
University of Kent at Canterbury
University of Portsmouth, Dept of Civil Engineering
Vivendi Water Partnership
Vosper Thornycroft
Water UK
WaterVoice
West Berkshire Council
West Burgess Hill Company
West Sussex County Council
West Sussex Economic Partnership
Wey and Arun Canal Trust
Wiggins Group plc

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