

SW 103

GA-SOUTHWEST LEAPs

local environment agency plan

BRUE AND AXE ACTION PLAN MARCH 1998



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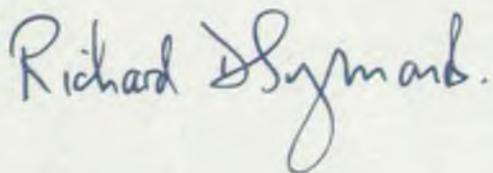
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Foreword

The catchment of the Brue and Axe includes a major part of the Somerset Levels and Moors. The rivers and tributaries make an important contribution to the rural economy through agriculture and an equal contribution to the urban economy through public water supply, effluent disposal, waste disposal, recreation and tourism.

This Action Plan sets out the actions that the Agency and other organizations plan to carry out over the next five years. The actions address problems that arise from the pressure on the environment and seek new opportunities to enhance it. Other solutions will be looked at in a longer term perspective over a wider area.

The spirit of partnership needed to implement this plan is represented by the valuable contributions received from local authorities, environmental and interest groups, as well as the public, who responded during the consultation period. This partnership will ensure that all who care for the environment can work together to enhance the area.



RICHARD SYMONDS
ACTING AREA MANAGER (NORTH WESSEX)

Additional Copies

Further copies of this Action Plan can be obtained from:

Alan Turner

Team Leader LEAPs

Environment Agency South West Region

Rivers House

East Quay

Bridgwater TA6 4YS

Tel: 01278 457333

General Inquiries

For general information about the work of the Environment Agency, or information about a specific matter, please contact our Customer Contact Team at the Bridgwater Office

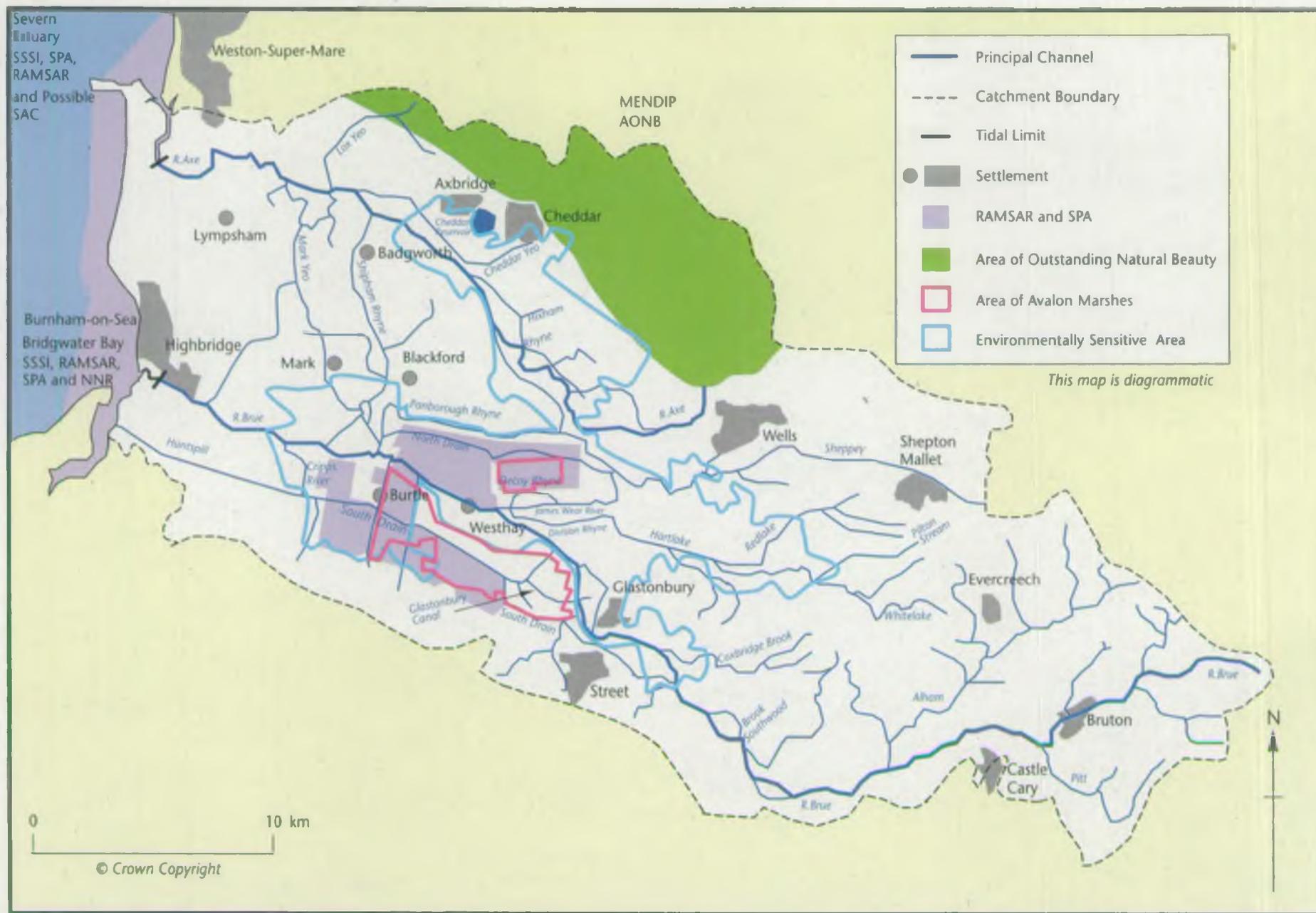
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Note: This is not a legally or scientifically binding document.

Map 1 - River Brue Catchment



Information correct as of January 1998

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1. The Environment Agency

1.1 Our vision

- A better environment in England and Wales for present and future generations.

1.2 Our aims

- To achieve major and continuous improvements in the quality of air, land and water.
- To encourage the conservation of natural resources, animals and plants.
- To make the most of pollution control and river-basin management.
- To provide effective defence and warning systems to protect people and property against flooding from rivers and the sea.
- To reduce the amount of waste by encouraging people to re-use and recycle their waste.
- To improve standards of waste disposal.
- To manage water resources to achieve the proper balance between the country's needs and the environment.
- To work with other organizations to reclaim contaminated land.
- To improve and develop salmon and freshwater fisheries.
- To conserve and improve river navigation.
- To tell people about environmental issues by educating and informing.
- To set priorities and work out solutions that society can afford.

We will do this by:

- being open and consulting others about our work;
- basing our decisions around sound science and research;
- valuing and developing our employees; and
- being efficient and businesslike in all we do.

2. Introduction

The Environment Agency is a new body. It has a wide range of duties and power relating to different aspects of environmental management. It is required and guided by Government to use these duties and powers in order to help achieve the objective of sustainable development. The Brundtland Commission defined sustainable development as ".... *development that meets the needs of the present without compromising the ability of future generations to meet their own needs*".

At the heart of sustainable development is the integration of human needs and the environment within which we live. Indeed the creation of the Agency itself was in part a recognition of the need to take a more integrated and longer term view of environmental management at a national level. The Agency therefore has to reflect this in the way it works and in the decisions it makes.

Taking a long term perspective will require the Agency to anticipate risks and encourage precaution, particularly where impacts on the environment may have long term effects, or when the effects are not reversible. The Agency must also develop its role to educate and inform society as a whole, as well as carrying out its prevention and enforcement activities, in order to ensure continuing protection and enhancement of the environment.

Although the Agency only has duties and powers to protect some environmental resources, it will need to contribute to other aspects of environmental management even if these are, in the first instance, the responsibility of others. The Agency can only do this effectively by working in partnership with and through others in order to achieve agreed objectives.

Much of the UK's environmental legislation originates from the European Union. To date there have been five European Community (EC) Environmental Action Programmes which have collectively given rise to several hundred pieces of legislation of relevance to environmental protection, one of the most recent being the Directive on Integrated Pollution Prevention and Control. A number of other directives are currently under consideration, covering issues such as water management, air quality, and the management of waste using landfill.

The Agency also has to work in a wider international context because it is now generally accepted that environmental changes are occurring on a global scale. Individual countries contribute to these changes, and respond to them, in different ways. The Agency's long term strategy therefore has to reflect these global issues, and it has to be delivered within the framework of international and national commitments which has been developed to address them.

Perhaps the major international issue is that of climate change. The UK is a contributor to the emission of gases such as carbon dioxide into the atmosphere which are believed to contribute to long term climate changes. The UK will also be affected in a complex way as and when the climate does change. It is therefore a signatory to the Framework Convention on Climate Change, as agreed at the Rio Summit in 1992, and is taking an active part in international negotiations to obtain commitments beyond the year 2000 for credible, effective, and achievable reductions of greenhouse gas emissions.

Another outcome of the United Nations "Earth Summit" held in Rio de Janeiro in 1992 was agreement by governments that, in order to solve global environmental problems, local action is crucial: we must all therefore think globally but act locally. The Local Agenda 21 initiative set out actions needed to achieve sustainable development, including the need to make clear the links which exist between local life-styles and the use of resources. In the UK plans have now been formulated by local government and local communities to identify and address a wide range of environmental issues including natural resource use, pollution, health, local amenity and quality of life. These programmes set out long term

solutions that take account of global implications, such as the use of resources that affect the global environment and thus local communities in other parts of the world.

The Agency is committed to a programme of Local Environment Agency Plans (LEAPs) in order to produce a local agenda of integrated action for environmental improvement. These LEAPs will also allow the Agency to deploy its resources to best effect and optimize benefit for the local environment.

We are committed to delivering environmental improvement at the local level and one of the ways to do this will be through Local Environment Agency Plans. These plans will reflect our close contact with industry, the public and Local Government and will contribute towards achieving sustainable development.

The process of drawing up the plans will involve close consultation with all interested parties. It will promote the effective, accountable and integrated delivery of environmental improvement at the local level. The plans will translate policy and strategy into delivery on the ground and will result in actions, either for the Agency to fulfil, or for others to undertake through influence and partnership. We believe the process will benefit the local community by influencing and advising external decision makers and public opinion. It will build trust by being open and frank when dealing with all issues.

Nationally we will have published a Consultation Report for all plan areas in England and Wales by the end of 1999. In the North Wessex Area we have completed consultation on 4 plans out of 6, have started implementing 2 LEAP Action Plans, and have also contributed to the Severn Estuary Joint Issues Report which was published in May 1997.

2.1 Public Consultation

In July 1997 the Agency published the Brue and Axe Local Environment Agency Plan (LEAP) Consultation Report which promised an Action Plan for the catchment following a period of Public Consultation. The Agency consulted approximately 330 organizations and individuals directly about the issues which are outlined in this Action Plan and received 42 formal responses. These responses are summarized in our Report on Public Consultation available on request from this office. A list of organizations responding to the Consultation Report can be found in Section 12.4.

This Action Plan outlines how the Environment Agency and other organizations plan to tackle issues which affect the environment in the Brue and Axe Catchment. Issues are grouped and summarized under the headings of the Agency's 9 principal and immediate environmental concerns.

We have set up a LEAP Steering Group to help us produce this Action Plan. The membership of individuals and organizations reflects as many interests in the catchment as possible. A list of members and the interests they represent can be found in Section 12.3.

2.2 Updating and reviewing this plan

We will publish an Annual Review to report progress on carrying out our planned actions. This will also be an opportunity to add new issues and actions as they may arise.

2.3 LEAPs and Development Plans

Although we can control some of the things which influence the quality of the environment or affect flood risk we have very little direct control over the way that land is developed. This is the responsibility of local planning authorities. Local planning authorities prepare statutory development plans. The policies in these plans will guide the way that land is developed in the future.

Guidance has been published and will soon be updated for local planning authorities to encourage them to adopt policies that protect the water environment from the harmful effects of development. Where we can, the Environment Agency will reinforce these policies when we comment on planning matters or if we are making our own decisions. The Agency will also advise planning authorities on planning matters related to industrial processes, waste management and the storage, use and disposal of radioactive material.

This Action Plan highlights our concerns about development. The Environment Agency is in detailed discussions with local planning authorities with respect to provision of land allocations in Local Development Plans for their Plan period up to 2011.

2.4 Protection through partnership

The Agency works in partnership with many organizations and individuals concerned with the protection and enhancement of the environment. In the UK as a whole much has been achieved already but much more is possible by working closely with others. The Agency is essentially a regulatory body and does not give grants, so to achieve some of its aims it must co-operate with others such as the local authorities and Ministry of Agriculture, Fisheries and Food (MAFF) to harness their financial resources and technical expertise. The Agency can also work towards its objectives by working with voluntary groups such as the local wildlife trusts and recreational associations. In some cases partnerships are already well established with other statutory bodies, especially where there is joint responsibility, such as the Water Level Management Plans produced by the Internal Drainage Boards with advice from the Agency.

This section outlines some of these partnerships and indicates opportunities for further development.

2.4.1 Links with local authorities

We advise the local planning authorities on the impact of proposed development together with our requirements for environmental protection. We also work with the local planning authorities to ensure that suitable policies to protect and enhance the environment are incorporated within Local Development Plans.

2.4.2 Air quality

The Agency and local authorities are both responsible for aspects of air quality monitoring and management, although local authorities are responsible for producing and implementing Local Air Quality Management Plans. We will build partnerships to develop and implement Local Air Quality Management Plans.

2.4.3 Amenity and recreation initiatives

We work on local authority led recreation initiatives. Local authorities often own the riverside land in towns and we work with them on schemes to enhance the town centre river corridor with, for example, landscaping, walkways and riverside seating.

As part of such schemes nature conservation can be furthered by creating wildlife habitats.

2.4.4 Litter

The Agency has no powers or resources to clear litter in and around rivers and so there is a need to work with local authorities and other groups on reduction and clearance schemes.

2.4.5 Local Agenda 21

Across the catchment, all local authorities are assisting their local communities in developing local strategies and action plans for sustainable development. The approach adopted varies from district to district, with many Local Agenda 21 groups setting up working groups looking at specific issues. We are currently looking at how we can be most effective in assisting local communities in developing their Local Agenda 21 plans.

2.4.6 Shoreline Management Plans (SMPs)

SMPs are being produced by a range of groups with statutory interests working together. They provide a forum for an integrated review of coastal processes and develop sustainable coastal defence policies to set objectives for the future management of the shoreline. The SMP that includes the coast within this LEAP is called the Bridgwater and Bideford Bays SMP.

2.4.7 Working with businesses

We are working in partnership with local businesses to promote pollution prevention and waste minimization. Examples include:

- our "3 E's" campaign (Emissions, Efficiency, Economics) which aims to reduce waste, packaging, effluent and energy use and thereby both help the environment and save the business money;
- farm waste management plans developed with farmers and the Farming and Rural Conservation Agency (FRCA);
- our oil care campaign;
- our training video for construction workers;
- our work with the Farming and Wildlife Advisory Group (FWAG) to promote environmentally friendly farming practices.

2.4.8. Conservation

Within Environmentally Sensitive Areas, the Agency, MAFF and English Nature are working in partnership with local farmers and Internal Drainage Boards to produce Water Level Management Plans and Raised Water Level Areas to provide the ideal habitat for over-wintering wildfowl, breeding waders and to preserve the peat soils. We engage in jointly funded survey and monitoring work with English Nature and others, undertaking waterfowl counts, grassland and ditch plant and invertebrate surveys on the Somerset Levels and Moors.

An extensive programme of wetland restoration is being undertaken within the Peat Production Zone now known as the Avalon Marshes Project. The principal agents are Somerset County Council, English Nature, the RSPB and Somerset Wildlife Trust.

We undertake species survey work with Somerset Wildlife Trust, Somerset Environmental Records Centre, and the Hawk and Owl Trust.

The Somerset Levels and Moors Partnership (LAMP) was formed in 1995 as the successor to the Levels and Moors Countryside forum, and is made up of local authority members, people from community organizations and statutory bodies including the Environment Agency. It consists of three parts:

- LAMP - made up of about 27 members including six elected Parish Council Forum representatives;
- Levels and Moors Parish Council Forum - with over 90 member parishes providing direct community oversight;
- LAMP Steering Group - drawn from LAMP and consisting principally of elected community representatives.

Its key tasks are:

- the formulation of strategies for the Levels and Moors;
- consultations and Reviews;
- advise on the co-ordination of the actions of the five main local authorities;
- promotion of public awareness and community "pride of place".

Within this catchment LAMPs activities have so far focused mainly on the afteruse of the Peat Production Zones of the Brue Valley and associated initiatives and activities such as tourism and recreation.

2.4.9

Education

We recognize that broad-based education covering the community, educational and industrial sectors will result in a more informed society that is better able to understand the environment, its needs, and the impact of society's activities upon it. In particular, there is a need to:

- educate young people to equip them to make informed judgements about future environmental decisions;
- educate industry through consultation, collaborative activities and targeted campaigns to promote a culture of prevention rather than cure;
- raise public awareness of environmental issues to engender in society a common ownership of the environment and its challenges.

Currently, we provide a wide range of information to all sectors of society, and in addition give many talks and presentations. The Agency has recently published a leaflet entitled 'Green Shoots our vision for Environmental Education'.

Each LEAP is guided by a Steering Group whose members are drawn from our key customers and include: English Nature, Country Landowners Association, National Farmers Union, Internal Drainage Boards, Local Authorities, Industry, Waste Management Companies, Wildlife Trusts, Fisheries Interest, British Canoe Union and Water Companies.

We are working in partnership with the public to identify pollution incidents through our Pollution Hotline 0800 80 70 60.

This plan area comprises the surface water catchments of the Rivers Brue and Axe and lies wholly within the county of Somerset. The majority of the population of 102,600 (1991 Census) is concentrated in eleven comparatively small settlements. The neighbouring towns of Burnham-on-Sea and Highbridge form the largest settlement with a population of approximately 17,000.

The River Brue rises in the clay uplands to the east of the catchment, before flowing slowly through the flat lowlands of the Somerset Levels and Moors, often in man-made channels, before entering the sea at Highbridge.

The River Sheppey and the River Axe and its tributaries, the Cheddar Yeo and Lox Yeo, rise from limestone springs on the Mendips, before flowing through the Somerset Levels and Moors to the sea just north of Brean Down. The rivers are interconnected in several places by rhynes controlled by sluices, forming a very complex artificial drainage system.

Much of the catchment is lowland wet grassland and forms part of the unique landscape of the Somerset Levels and Moors.

The catchment is of major importance to wildlife conservation. Of over-riding importance is the internationally designated lowland wet grassland resource of the Somerset Levels and Moors, the largest remaining area of this habitat in Britain. Five of the wetland Sites of Special Scientific Interest (SSSI) have recently been designated as a Special Protection Area (SPA)/RAMSAR site of international importance with 51 Sites of Special Scientific Interest (SSSIs) and 33 County Wildlife Sites. Significant areas, including Bridgwater Bay are designated as Special Protection Area (SPA) and RAMSAR sites possible Special Area of Conservation (SAC). These designations are because of their international importance for over-wintering wildfowl and breeding waders.

The catchment also contains a large number of Scheduled Ancient Monuments, particularly in the South Mendips.

The catchment is predominantly agricultural with an increasing amount of tourism including the evolving Avalon Marshes Project to the west of Glastonbury. The Royal Ordnance factory is situated at Puriton just to the north of Bridgwater. Some light industry is centred around the main towns and there are two limestone quarries in the Mendips. There is cider making at Shepton Mallet, a paper mill at Wells and peat extraction to the west of Glastonbury.

In 1995, 27% of monitored river length in the Brue and Axe Catchment was of good or very good chemical quality, while 60% was fair and 13% was of poor or bad quality. In biological terms 60% of the monitored river was of excellent quality and the remaining 40% was good or fairly good quality. Between 1990 and 1995 there was an overall improvement in chemical quality of 15% of monitored river length while biological quality improved by 35%. The large difference in biological quality between 1990 and 1995 is considered partly attributable to the introduction of new/improved monitoring techniques.

The topic chapters which follow outline actions for resolving the issues identified in the Brue and Axe LEAP Consultation Report and through the public consultation.

In this plan some environmental matters which are of concern to us are dealt with adequately by our routine work and so no specific actions are included. Specific actions are only included where we do not consider our routine work is sufficient to resolve a problem.

For a full discussion of the issues please refer to the Brue and Axe Consultation Report section 3. The costs identified represent our planned expenditure over the next five years. However, our policy and priorities may change during this time; this may affect how much we will actually be able to spend on specific issues.

The financial years covered by this Plan are represented by a single date, for example, '98' represents the financial year April 1998 to March 1999. Where costs are shown by a '*' this is because it is shown where the action has been covered elsewhere in the plan.

3. Climate Change

The climate has always been changing, but the rate of change appears to be increasing in recent years. There is a broad consensus of scientific opinion that such changes are occurring because of the impact of human activities on the global atmosphere. Regardless of the cause, however, it is essential to allow for changes to the climate of the UK in the foreseeable future. Thus even if a relationship between climate change and inputs to the atmosphere can be demonstrated, it is not easy to predict how these changes will manifest themselves and the rate at which they will take place. Predictions have been largely based on the modelling of environmental processes and using these models to analyse different scenarios. It is becoming increasingly important that these predictive approaches are underpinned by integrated monitoring and assessment programmes to validate predictions and measure any real changes that are actually occurring. Careful thought will need to be given to the design of such programmes to reflect the long term and cross-media (air, water and land) nature of the effects of climate change and to address the inherent variability of environmental processes.

It is now generally accepted in Europe that there is a high risk that some chemical emissions to the atmosphere may have a significant impact on the global environment. Emissions of a range of gases, notably carbon dioxide and methane, are adding to the natural "greenhouse" effect which may cause global warming. Estimated emissions of carbon dioxide nationally from large industrial processes and other sources in the UK in 1990 reached 155 million tonnes. The international community is trying to get the major industrialised countries to sign up to achieving reductions of these "greenhouse" gases. Currently Britain is committed to reducing emissions to 1990 levels.

It is estimated that because of global warming sea levels world-wide will rise by more than 500 mm in the next 100 years, although the present rate is probably about 2 mm per year in the Severn Estuary. With a rise of, say, 3 mm per year, tide levels which have a statistical probability of occurring once every 200 years on average at Avonmouth will be twice as frequent (once in 100 years) by 2006 and twice as frequent again (once in 50 years) by 2016. The Environment Agency uses these probabilities to design target standards for different land uses.

Hence, a scheme designed to meet the standard of protection for high density urban development would only meet that appropriate for rural communities, by 2016, if additional action was not taken. The improvement of defences will take place within the strategic framework of Shoreline Management Plans.

In addition some scientists believe that storms will become more frequent and more violent as a result of global warming although this effect has not yet been confirmed. Storms can raise sea levels above predicted levels and generate increased wave action, causing overtopping and increased erosion of existing defences.

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 8 climate change actions, 3 of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 help to ensure that the Government's greenhouse gas emissions reduction targets are met;
- 2 set an example by reducing our own energy and fossil fuel consumption;
- 3 provide improved mapping of low-lying coastal areas at risk from sea-level changes.

To help with point 1 we are reducing emissions to air from the most complex industrial processes within the catchment. The Environment Agency is responsible for authorizing and regulating emissions to air from these processes, including power stations, refineries, steel and chemical works, cement and lime production and waste incineration. A National Atmospheric Emissions Inventory is prepared each year for the Department of the Environment, Transport and the Regions (DETR) by the National Environmental Technology Centre (NETCEN).

Point 2 shows how we have set targets to reduce our own energy and fossil fuel consumption and we have appointed a Regional Officer to co-ordinate our internal environmental management.

The coastal Levels are slightly higher at approximately 6 m OD than the inland peat Moors (4 m OD on average) and so are less likely to suffer fluvial flooding. However, the Levels are generally below the High Water Spring Tide level (approximately 8 m OD) and so are threatened by tidal flooding.

The maps referred to in point 3 are known as "Section 105 maps". The standard used is a flood which has a statistical probability of happening once in 200 years. We build into that prediction an allowance of 5 mm per year up to 2030 for sea level rise resulting from climate change as required by Ministry of Agriculture, Fisheries and Food (MAFF) and the Welsh Office.

4. Air Quality

In March 1997 the Government published a national strategy for air quality including: a framework of standards and objectives for the pollutants of most concern; a timetable for achieving objectives; and the steps the Government is taking and the measurements it expects others to take to see that objectives are met.

We will be working closely with local authorities to help achieve the objectives of the National Air Quality Strategy, principally through our regulation of emissions to air from controlled ("Part A") major industrial processes under Integrated Pollution Control (IPC). Local authorities are responsible for the regulation of smaller, less complex ("Part B") industrial processes and reducing traffic pollution.

In due course air quality standards may be prescribed in regulations made by the Government and obligations placed on local authorities regarding the establishment and operation of local air quality management areas. Local authorities will have to carry out periodic reviews of air quality in their areas. Where standards are not being met or are not likely to be met they will make action plans to improve air quality in these areas. Local authorities have the major responsibility for managing air quality.

Ambient concentrations of smoke and sulphur dioxide have generally declined in the UK as a whole over the last 20 years. Similarly, both the quantity released and the concentration of lead in the atmosphere has declined since the mid 1980s following the introduction of lead free petrol. However, the release of some pollutants such as nitrogen oxides, carbon monoxide and volatile organic compounds have remained relatively stable during this period, although there may have been changes in their source. For example, releases of oxides of nitrogen from industrial sources have generally declined whilst emissions from road traffic have increased. Planned development in the catchment will lead to an increase in vehicle movement and therefore increasing the amount of polluting discharges, especially oxides of nitrogen. With the exception of ground level ozone, ambient levels of these pollutants are generally lower in the South West of England than in many other parts of England and Wales.

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 5 air quality actions, all of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 help the government deliver its Air Quality Strategy;
- 2 ensure emissions from the major industrial processes to the atmosphere are reduced;
- 3 ensure specific emissions of sulphur dioxide and oxides of nitrogen, which contribute to acid rain, are reduced;
- 4 discourage the use of solvents in industry, which contribute to the production of ozone, the major photochemical pollutant;
- 5 set an example in reducing emissions from vehicles by reducing our own mileage and increasing the use of public transport.

We will help achieve the targets of the National Air Quality Strategy in a number of ways, for example we will work with local authorities, government agencies, and developers to ensure that developments make use of transport options producing the least pollutants. The Government is soon to publish the National Transport Strategy which will have an important bearing on this issue.

The major industrial processes in this catchment referred to in point 2 are: the manufacture or recovery of nitric, sulphuric, acetic acids and mixed acids; the manufacture of organic chemicals, mainly explosives; and the production of lime.

5. Water Resources

There is a continuing need to balance the demands for, and supply of, fresh water. Nationally about half of the present demand is for water to be put into public supply, and the water resources which have been developed to meet this demand are highly integrated; in many cases they involve a combination of water drawn from rivers, underground aquifers (a layer of water-bearing rock), and reservoirs, and often supplied through an interconnected grid of pipes. In this catchment 92% of licensed abstraction is for public supply.

The Environment Agency has a duty under the Water Resources Act 1991 to take action, as and when it considers necessary, in order to conserve, re-distribute or otherwise augment water resources in England and Wales, and to secure the proper use of water resources.

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 16 water resources actions, 11 of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 demand a more efficient use of water and reductions of leakage by the water companies and by industry in general;
- 2 encourage a more efficient use of water by the public and a change in public attitude to water usage;
- 3 demand reductions in leakage by the water companies before considering any cases for investment in new reservoirs;
- 4 support the imposition of compulsory selective metering where water supplies are under stress and where meters are economically sensible to install;
- 5 support the voluntary acceptance of water meters when accompanied by other water-saving incentives for the customer;
- 6 vigorously apply our Groundwater Protection Policy to ensure that the quality and use of the groundwaters is improved;
- 7 examine water transfer schemes carefully to ensure that no environmental damage would result from their introduction;
- 8 not approve the exploitation of new environmental resources until water saving measures have been introduced;

- 9 implement the current programme of alleviating low flow rivers as quickly as possible;
- 10 ensure that the practical limitations arising from water supply and treatment are fully considered by providing local planning authorities with all information relevant to new housing or industrial developments;
- 11 ensure that all environmental needs are fully taken into account within the next Asset Management Plans (AMPs) negotiations with the water companies.

Major aquifers such as the Mendip Hills provide large amounts of water for public supply e.g. Cheddar Springs, therefore point 6 on the protection of groundwaters is particularly important in this catchment.

The precise impact of new development on water resources is difficult to predict and plan because the water company supply zones are much larger than this catchment and because water can be piped in from other sources.

We will also seek ways to improve summer low flows and achieve a better use of water in the Somerset Levels and Moors to improve water quality in the main rivers. We are currently reviewing our Somerset Levels and Moors Strategy which will lead to a review of water levels and water management.

The current level of demand in Bristol Water's Supply Area is forecast to rise from 310 MI/d to 427 MI/d by 2021 assuming the current level of metering and leakage control with high growth in domestic, industrial and commercial consumption. Should growth in consumption be slower and Bristol Water reduce leakage to 120 litres per property per day then demand is forecast to rise to 380 MI/d by 2021.

Currently, Bristol Water's resources exceed demand by 17 MI/d. By 2021, under the lower demand forecast scenario the company's demand is predicted to exceed resources by 19 MI/d. Under the higher demand scenario the deficit is forecast to rise to 66 MI/d by 2021.

The above is based on average demand not peak demand. Despite the very dry weather and elevated demands for public water during 1995 both Bristol Water and Wessex Water were able to meet their customer's needs with no or minimal restriction. However, it is clear that an analysis of peak demand against resources rather than average demand could bring forward some of the supply deficits mentioned in this section. However, Wessex Water have no plans for any new sources within this catchment. For full details of the wider water resources situation see the Agency's South West Regional Water Resources Strategy document "Tomorrow's Water".

5.1 Securing future public water supplies

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
5.1.1 Manage Demand - We will work with the water companies to identify any problems meeting demands in Resource Zones and consider viable solutions.	Agency, Bristol Water, Wessex Water	Unknown	●	●	●	●	●
5.1.2 Manage Demand - We will monitor and encourage implementation of water company efficiency plans.	Agency, Bristol Water, Wessex Water, consumers	Unknown	●	●	●	●	●

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
5.1.3 Manage Resources - We will encourage the companies to actively reduce leakage to economic levels.	Agency, Bristol Water, Wessex Water	Unknown	●	●	●	●	●
5.1.4 Manage Resources - We will encourage the joint use of sources in order to increase the amount of water deliverable without requiring physical development of new sources.	Agency Bristol Water, Wessex Water, other water companies	Unknown	●	●	●	●	●
5.1.5 Work with water supply companies to prioritize expenditure on water resource management and development. Ensure Agency's demand management targets are met.	Agency Bristol Water Wessex Water	Unknown	●	●	●	●	●

5.2 Other water supplies

The remaining 8% of licensed abstractions are for agriculture, industry, private domestic supply, spray irrigation, commercial and leisure. Currently demand is more or less static and we do not have any general licensing constraint policy for this catchment. New licence applications would be looked at on a site-specific basis. This policy stance is supported by the fact that only 35% of the total volume of theoretically available water in this catchment is licensed for abstraction. However, we are closely monitoring the overall demand situation.

6. Biodiversity

The European Union is concerned about the decline in biodiversity (the variety of life on earth). As a result member states are producing Biodiversity Action Plans (BAPs) in an effort to halt and reverse the decline of species and habitats. The UK Biodiversity Action Plan lists key habitats and species which require conservation action, through Regional and Local Biodiversity Action Plans. The Regional Biodiversity Audit Plan for the South West was published in April 1996 and was followed by Action for Biodiversity in the South West in June 1997 - a series of habitat and species plans to guide delivery. The Regional and Local Action Plans are currently being developed by local authorities, English Nature and others, including the Environment Agency.

We are working with a number of organizations to formulate and implement habitat and species action plans at both regional and local levels over the next 5 to 10 years, including:

- The Mendip District Council BAP,
- Local Agenda 21 Action Plan,
- English Nature's Natural Area BAPs.

The Agency is developing National Species Action Plans and is the contact point for the following species which are known to occur within the catchment: otter, water-vole and native crayfish. The Agency also has an important role to play in partnership with others in the conservation of habitats including: lowland wet

grassland; rhyes and ditches; reedbeds; fen meadows; raised mires; tufa depositing springs and headwater streams. We aim to protect sensitive sites through our authorizations to abstract water and discharge effluents and through our own activities.

Biodiversity is a key indicator of sustainable development (see 9.1).

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 12 enhancing biodiversity actions, 11 of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 play a full part in implementing the European Community (EC) Habitats' Directive (see 6.1.1);
- 2 play a full and active part in delivering the UK's Biodiversity Action Plan by acting as the "contact point" for the chalk river's plan, and for 12 species of aquatic animals and plants, including the otter, the water-vole, and rare species of fish, and by acting as the "lead partner";
- 3 ensure that all aspects of the Biodiversity Action Plan are incorporated into the Agency's guidance and become part of its Local Environment Agency Plans;
- 4 implement a series of regional projects, in partnership with local conservation groups, to deliver biodiversity targets at specific sites;
- 5 allocate specific resources to conservation projects aimed at increasing biodiversity;
- 6 control eutrophication, where feasible, in order to enhance biodiversity (see 8.3);
- 7 improve the management of wetlands for conservation purposes;
- 8 use and promote the best environmental practice for the protection and restoration of river habitats;
- 9 develop and set conservation criteria for all of the Agency's environmental licensing activities;
- 10 implement specific projects to restore habitats in rivers and lakes, increase the area of reedbeds and other water plants, and improve river banks;
- 11 ensure that there is no deterioration in the quality of the aquatic environment in particular, and deliver significant improvements in river and still water quality by tackling diffuse pollution of them (see 8.6).

In addition we will act as the "contact point" for the otter, water-vole and native crayfish. We will also advise landowners and farmers on the control of invasive, alien plant species, in particular Japanese Knotweed. English Nature report problems with Brazilian water milfoil in West Hay Moor.

6.1 Maintaining and enhancing biodiversity

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
6.1.1 Following advice from English Nature (EN) review current abstraction licences and consents to discharge in relation to SPA/RAMSAR/pSAC designations as required by the EC Habitats' Directive. The review will consider the inclusion of nutrients as part of consents.	Agency, EN	Unknown	●	●	●	●	●
6.1.2 Rhynes and ditches (and associated species of plants and invertebrates). In the light of earlier survey work (1994) develop a revised programme to monitor water quality and biological conditions in SSSIs to investigate causes of eutrophication and duckweed blooms.	Agency, EN	5		●			
6.1.3 Fen meadows and raised mire communities. Continue national programme to reduce emissions of sulphur and nitrogen oxides from major power plant and thereby reduce pollution from fallouts onto these sites.	Agency, National Power See Section 11	-	-	-	-	-	-
6.1.4 We are continuing to contribute to the development of WLMPs within the Brue and Axe Catchment.	Agency, IDB, landowners See 8.1.3	Unknown	●	●			
6.1.5 Lowland wet grassland. Implement the Somerset Levels & Moors Water Level Management Conservation Strategy.	Agency, IDBs, landowners, EN, MAFF See 8.1.2	-	-	-	-	-	-
6.1.6 Help to promote reedbed creation in partnership with others e.g. Avalon Marshes through the provision of technical advice.	Agency	0.4	●	●	●	●	●
6.1.7 Tufa depositing springs and headwater streams. Survey to assess value and develop conservation strategy.	Agency, SERC, Somerset Wildlife Trust (SWT)	2	●				
6.1.8 Water-voles - Increase our knowledge of distribution, in partnership with others.	Agency, Wildlife Trusts, Record Centres	Unknown	●				
6.1.9 Otters - Develop partnership to monitor otter populations and enhance habitats and take steps to reduce road deaths.	Agency, SWT	Unknown	●	●	●	●	●
6.1.10 Otters - Collect carcasses of otter road casualties and send for tissue analysis.	Agency	3	●	●	●	●	●
6.1.11 Barn owls - Extend scheme to provide nest boxes and manage habitat to encourage voles on Agency owned land e.g. Huntspill and South Drain.	Agency, Hawk and Owl Trust, IDBs	2	●	●			
6.1.12 Barn owls - Explore the possibility of developing, in partnership with others, corridors with long grass suitable for linking existing owl populations.	Agency, Hawk and Owl Trust, IDBs	0.5	●				
6.1.13 Native crayfish - Continue to support survey work, particularly within the Alham catchment to enable the formulation, and implementation of a conservation strategy.	Agency, SERC	1.5	●	●	●	●	●

7. Fisheries

The Environment Agency has a specific duty to assess the state of, and safeguard, freshwater fisheries and the waters which they inhabit. In 1978 an European Community (EC) Freshwater Fish Directive was adopted (78/659/EEC) with the purpose of setting water quality objectives, for designated stretches of water, to enable fish to live continuously or breed in favourable conditions. Two categories of water were identified: those suitable for salmonids (salmon and trout), and those suitable for cyprinid fish (carp, tench, barbel, rudd, roach), the essential difference between the two categories being that salmonid fish habitats are characterized by fast flowing reaches of rivers which have a high oxygen content and a low level of nutrients, whereas cyprinid fish habitats are those of slower flowing waters which commonly pass through actively-managed agricultural land. Various standards were set in relation to these categories, including values for dissolved oxygen, pH, non-ionised ammonia, total ammonium, total residual chlorine, zinc and, where thermal discharges occurred, temperature. The Directive does allow for the granting of derogations at a national level with respect to certain substances, for which the required standards may be exceeded in cases of exceptional weather conditions, or geographical conditions, or because of natural enrichment of the water from substances leaching from the soil.

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 12 managing our freshwater fisheries actions, 6 of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 monitor every river fisheries over a 5 year rolling cycle;
- 2 restore spawning grounds for freshwater fish;
- 3 tackle mine-water pollution at the head of streams to improve spawning grounds;
- 4 implement a programme of minimum acceptable flow for rivers;
- 5 develop specific longer-term strategies for salmon, trout and coarse fisheries;
- 6 reduce poaching to a minimum and bring rod licence evasion to under 10%.

Additionally we will tackle the problems of:

- penning and low flows which cause or contribute to adverse effects on fisheries. Algal blooms can cause or contribute to the exceedence of EC Freshwater Fish Directive Standards (see 6.1, 8.1 and 8.2).
- maintenance of rivers, particularly weedcutting, often stirs up sediment causing oxygen depletion and distress to fish (see 8.2). Also, the operation of sluices needs to take fisheries into account.

As well as adequate water quality the diversity of physical habitat is important for supporting good fish populations. We will take opportunities to improve habitat diversity (see 6.1).

Pumping out of peat diggings cause or contribute to the exceedence of EC Freshwater Fish Directive Standards (see 8.5, 8.6).

7.1 Eel and elver fishery

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
7.1.1 Implement recommendations of Barriers to Migration survey.	Agency	Unknown	●	●	●	●	●
7.1.2 Assessment of adult stock in routine fisheries surveys.	Agency	Ongoing	●	●	●	●	●
7.1.3 Research and Development - eel and elver stocks in England and Wales, their status and management.	Agency, MAFF	50	●				
7.1.4 Complete National review of licence duties eels and elvers.	Agency	0.5	●	●			
7.1.5 Continue liaison with police and parish councils.	Agency	Ongoing	●	●	●	●	●
7.1.6 As consultee contribute to Government Review of Fisheries Legislation.	Agency	Unknown	●	●			

8. Integrated River-Basin Management

Integrated river-basin management is a way of looking at the river and its surrounding land as a whole. It not only looks at the quality and quantity of water in the river but also at its physical environment including landscape, recreational use, flood control works and the wildlife the river and its surroundings support.

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 16 delivering integrated river-basin management actions, 14 of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 manage river-basins in an integrated way, via Local Environment Agency Plans;
- 2 ensure that all waters are of sustainable quality for their different uses;
- 3 deliver a continual improvement in overall water quality;
- 4 provide effective flood defence;
- 5 provide an effective flood warning system;
- 6 increase the number of rivers and still waters capable of supporting viable fisheries;
- 7 enhance and conserve inland navigations, as national assets of environmental, economic, social and recreational value;
- 8 improve river habitat quality as measured by river habitat surveys;
- 9 improve wetland management;
- 10 improve riverside landscapes;

- 11 improve bathing water quality;
- 12 improve estuarine waters for shellfisheries;
- 13 increase the number of Agency-owned sites available for public recreation;
- 14 work with local authorities to maximize the conservation and recreational use and value of our river-basins.

Water quality - we manage water quality by setting targets called River Quality Objectives (RQOs). They are intended to protect current water quality and future use, and we use them as a basis for setting consents for new discharges and planning future water quality improvements. We are reviewing consents to discharge to SPA/RAMSAR/pSACs (see 6.1.1).

We also manage water quality by applying standards set in European Community (EC) directives and other international commitments.

We have proposed our RQOs using a classification scheme known as River Ecosystem (RE) which was introduced by the National Rivers Authority, following public consultation, in 1994. The RE classification comprises five hierarchical classes as summarized below.

RQO (RE Class)	Class Description
RE1	Water of very good quality suitable for all fish species
RE2	Water of good quality suitable for all fish species
RE3	Water of fair quality suitable for high class coarse fish populations
RE4	Water of fair quality suitable for coarse fish populations
RE5	Water of poor quality which is likely to limit coarse fish populations

The latest compliance with the targets we have set are shown on Map 2.

We also monitor biological quality and classify river reaches using a scheme of 6 classes.

Biological Class Descriptions

Biological Class	Description
a	Very good
b	Good
c	Fairly good
d	Fair
e	Poor
f	Bad

Flood defence - the Brue Catchment, particularly in the lower reaches, has been highly modified to control river and tidal flooding and provide summer water supply for wet fencing and irrigation. Riparian landowners have the responsibility to maintain the watercourses on their land although in practice the situation is rather different. Under the Land Drainage Act 1991 the more significant rivers are designated as *main river* and the Act gives the Agency powers to maintain them, and in practice we maintain them using money obtained from a precept on the Council Tax. We are also responsible for a large number of water level management control structures. The four Internal Drainage Boards, Lower Axe,

Upper Axe, Lower Brue and Upper Brue, have powers to maintain non-main river rhynes within their areas. In practice they only maintain the more important ones, called "viewed rhynes" using money obtained from a precept on landowners within their area.

Local authorities have powers to maintain non-main river though in practice they only exercise them where lack of maintenance is causing a significant flooding problem. The Agency has an overall duty to supervise flood defence matters. We do this by advising on who is the appropriate person or body to deal with a problem.

In accordance with the Department of the Environment (*DoE Circular 30/92 Development and Flood Risk*) we advise planning authorities on flood defence matters. We also issue consents and byelaw approvals for certain works which are likely to affect the flow of water or impede any drainage work.

Future development proposals within North Somerset, Mendip, Sedgemoor, and South Somerset Local Plans are concentrated primarily within and around the existing settlements within the Brue Catchment.

Levels of flood protection, tidal for the lower catchment, and fluvial for the upper catchment are relatively high, however, increased development will require flood mitigation works to overcome risk to third parties from increased surface water disposal.

Absolute flood protection is not possible. Because of this we need to warn people when there is a danger of flooding. We took over the role of warning the public and other organizations of likely flooding from the police on 1 September 1996. We have developed communication systems and aimed at providing flood warnings to those members of the public most at risk. We have a strategy which details how the procedures operate, called the Flood Warning Dissemination Plan for Somerset and Avon areas, a copy is held in the Area office for public inspection.

Warnings are issued by direct contact and via local radio. Recorded information on current flood warnings is also provided. Leaflets are also available from Agency offices which fully explain the flood warning service.

A study of the level of service for flood warning is currently being carried out to determine whether the required standard is met; it is expected to be complete by April 1998. The results will identify additions and other changes to the flood warning service.

Nature conservation - the Brue and Axe Catchment is of outstanding importance for nature conservation and contains some of the finest wetlands in South West England. These are part of the Somerset Levels and Moors for which we launched the Somerset Levels and Moors Water Level Management and Nature Conservation Strategy in February 1992. A primary target is to provide core areas where shallow winter flooding will create feeding sites for wintering waterfowl and suitable conditions in spring and early summer for breeding waders. The Somerset Levels and Moors Water Level Management Strategy Review Public Consultation was launched on 2 February 1998 (see 8.1.1).

8.1

Water level management on the Levels and Moors

Only a small proportion of the catchment lies above the typical lowland water table. In summer the flow of groundwater from the upland is only just sufficient to satisfy the demands of the rivers, abstraction, and irrigation of the Moors and Levels. At times in the summer, the water resources of the catchment are fully committed with no discharge to tidal waters. The irrigation of the Moors and Levels is achieved by holding back water with sluices or weirs (penning) and diverting flow sideways to top up the rhynes. Summer penning can raise water level by up to 2.5 m especially in the River Axe.

This traditional use of water must now compete with contemporary demands for water resources. Flow in some of the tributaries of the Axe is reduced by abstraction for public water supply. There is a very large public water supply abstraction from the source of the Cheddar Yeo. The Agency regulates this use of water through the abstraction licensing system although its powers to reduce existing licensed abstraction are very limited. The Cheddar abstraction has a licence of right which pre-dates the existing licence determination system. Any change to the licence would require compensation which we are unable to fund.

Developments to regenerate wetlands in the Brue valley will require the redistribution of water within the lowland system. We will use catchment models where appropriate to support our work to determine the feasibility of such changes.

Penning and low summer flows often give rise to high temperatures and low dissolved oxygen which caused or contributed to (see 8.1.3) non-compliance with RQOs on:

Hartlake	Stretch 23
Lox Yeo	Stretch 40
River Axe	Stretch 36

(For key to stretch numbers see Section 12.1).

Summer penning provides very little dilution for discharges and can lead to poor water quality (see 8.3). Quality is sometimes too poor for cattle to drink and they have to be fenced off from the river. Particular problems have been reported from the Decoy Rhyne where poor water quality is blamed for causing abortions in cattle (see 8.6).

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.1.1 Review the Somerset Levels and Moors Water Level Management Strategy (consultation period 2 February - 5 May).	Agency	20	●				
8.1.2 Implement agreed actions from the review of the Somerset Levels and Moors Strategy.	Agency	Unknown	●	●	●		
8.1.3 Review control of penning structures summer and winter water levels, and the operation of the summer supply network, through our role in contributing to the development of WLMPs for SSSIs.	Agency, IDBs	Unknown	●	●	●	●	●
8.1.4 Draw up Memoranda of Understanding with other users such as public water suppliers, IDB and conservation bodies to secure wise use of resources through our role in the development of WLMPs.	Agency, IDBs, SWT, EN, RSPB, Bristol Water, Wessex Water	0.5	●				
8.1.5 In partnership with others explore the feasibility of creating additional storage volume to provide more summer irrigation water.	Agency, IDB, landowners, conservation bodies	0.2	●				
8.1.6 Review modifications to the structure of Bleadon sluice together with a review of the conditions attached to the Bristol Water licence.	Agency	Unknown	●	●	●		
8.1.7 Consider the feasibility of developing drought contingency plans to safeguard water-related nature conservation sites.	Agency	Unknown	●				

8.2 The impact of river canalization and maintenance

The Brue and Axe are highly modified rivers and have been maintained by successive generations to control flooding and provide water for summer irrigation.

The present river channels have been substantially re-engineered and new channels such as the Huntspill River have been created. Present standards of flood protection can only be sustained by intensive maintenance of the channels and banks. This maintenance regime can bring environmental problems affecting water quality and river habitats.

The current review of flood defence maintenance should reveal if present practice is both justified and sustainable in financial and environmental terms. Conservation bodies and angling associations are concerned that maintenance practices are biased to favour agriculture, and do not respect the special environmental value of the Somerset Levels and Moors. An overall review and statement of the justification of these practices is needed.

Re-engineering channels to improve their wildlife, landscape and recreational value is costly and is only justifiable if major investment is needed to improve floodbanks or other flood defence structures. We are prioritizing river restoration schemes for the future and as part of these schemes we will be investigating opportunities for environmental and recreational enhancement. These may be the subject of partnerships with local authorities and other organizations in order to fund and to take forward projects. Specific archaeological consultation will be undertaken prior to detailed design of enhancement schemes.

Maintenance practices caused or contributed to non-compliance with RQOs on:

- South Drain Stretch 3
- North Drain Stretch 15

(For key to stretch numbers see Section 12.1)

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.2.1 Examine current weed removal practices to reduce risk of fish kills, to ensure compliance with EC Freshwater Fish Directive, and provide benefits for wildlife conservation.	Agency	4	●	●		●	●
8.2.2 In consultation with landowners and farmers, explore tree planting opportunities in appropriate places to provide shade and reduce the need for aquatic weed cutting.	Agency	3	●				

8.3 Eutrophication

Eutrophication can occur when water contains excess plant nutrients. Runoff from farmland and discharges from sewage treatment works both contain plant nutrients such as nitrogen and phosphorus. This nutrient enrichment often leads to luxuriant water plant growth, especially when the body of water is stagnant such as a lake, pond or penned river stretch. Algal blooms and water plants such as duckweed (*Lemna*) can choke eutrophic waters, reducing the quality of the water and the range of plants and animals it can support.

Two European Community (EC) Directives can provide remedies, but only if certain conditions are met. The EC Urban Waste Water Treatment Directive requires special standards of treatment including nutrient removal from Sewage Treatment Works (STWs) for discharges to certain sensitive areas. Discharges to the Brue and Axe Catchment have not been identified for special treatment under this directive. The EC Nitrates Directive requires member states to identify waters that are or could be affected by pollution from nitrates from agricultural sources. The rivers in the Brue and Axe Catchment have not been identified as being affected by pollution from nitrates under the terms of this directive.

However, there are waters which are rich in nutrients and do suffer algal and duckweed blooms from time to time, which do not fulfil the stringent conditions of these two EC Directives. We will work with farmers and other interested groups to reduce inputs of nutrients from farms and farmland by:

- promoting the creation of buffer strips especially where arable land is close to a watercourse;
- promoting the Ministry of Agriculture, Fisheries and Food (MAFF) Codes of Good Agriculture Practice for the Protection of Water and Soil;
- influencing and advising those involved in the spreading of waste to land under "exemptions" from the Control of Pollution Act.

Eutrophication caused or contributed to non-compliance with the RQO on:

Lox Yeo Stretch 40

(For key to stretch numbers see Section 12.1).

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.3.1 Promote the creation of buffer strips to take up excess fertilizer runoff (a leaflet is available).	Agency, MAFF, FWAG, English Nature (EN)	1	●	●	●	●	●
8.3.2 Rhynes and ditches (and associated species of plants and invertebrates). In the light of earlier survey work (1994) develop a revised programme to monitor water quality and biological conditions in SSSIs to investigate causes of eutrophication and duckweed blooms. (See 6.1.2).	Agency	-					
8.3.3 Introduce WQ monitoring for the SPA/RAMSAR sites to ensure they are maintained in a favourable conservation status.	Agency	Unknown	●				

8.4 Use of Environment Agency controlled land and water

We own significant areas of riverside land within the catchment, principally along the Huntspill and South Drain. We will work to enhance the nature conservation value of this land, and to promote appropriate recreation activities. Our conservation and recreation management plans will help to strike a balance between different recreational activities and between recreation and conservation. The plans will also take into account any archaeological interests in the area.

The Huntspill in particular has great potential. It is a National Nature Reserve and we are enhancing the habitat by creating bankside reedbeds and altering the grassland management regime. We have also been approached by the British Canoe Union (BCU) regarding use of the river for canoeing and rowing. We have agreed to permissive cycleways along the bank.

Areas in need of improvement should be identified in conjunction with the Local Authority. Around Glastonbury in particular, access to the River Brue could be greatly improved for use by the general public.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.4.1 Implement Huntspill Conservation and Recreation Management Plan.	Agency, English Nature (EN)	Unknown	●	●	●		
8.4.2 Produce a recreation and conservation management plan for the South Drain.	Agency	3		●			
8.4.3 Investigate feasibility of developing canoe access where appropriate.	Agency, BCU	Unknown	●	●	●	●	
8.4.4 Continue to support access/transport funding to Somerset Environmental Education Forum for schools to access sites of "hands on" environmental learning. ("Big Green Bus").	Agency	8	●				

8.5 The impact of peat extraction

The Brue valley contains significant areas of peat workings. Land must be drained to allow peat excavation. This drainage alters the hydrology over wide areas and has damaged some sensitive wetland habitats. Drainage also threatens the important archaeological assets of the area. Dewatering from peat extraction sites does not require an abstraction licence. Water pumped from excavated areas can be of significantly different chemical and physical quality to the surrounding ditches and can harm ecologically sensitive sites. The restoration of peat diggings for wildlife and recreation has great potential to enhance the biodiversity of the area.

We will give advice and technical support to proposals for the extraction of peat and the after use of the resulting voids and work with others on the Avalon Marshes wetland restoration within the Peat Production Zone.

The Somerset County Council archaeologist has expressed concern that peat extraction can not only destroy sites within the excavation but that the de-watering can dry out archaeological remains on adjacent land which leads to its decay. (The water within the peat helps to preserve archaeological remains). The County Archaeologist wishes to see research carried out into this impact which should be done by the peat industry with support from the Environment Agency and the Somerset County Council Minerals Planning Authority.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.5.1 Enter discussions with peat industry and conservation groups with a view to reducing impact of peat extraction.	Agency, peat industry, conservation groups	0.5	●				

8.6 The impact of agriculture

Agriculture is important to the economy and the environment of the area and the local farming economy is changing rapidly. The environmental burden from agriculture can be significant in some parts of the area. Problems are often most acute when traditional land management practices change for example from permanent pasture to the intensive outdoor rearing of pigs or cultivation of maize crops. This practice has raised concerns about possible pollution of important aquifers (a layer of water-bearing rock) in the Mendips. The Ministry of Agriculture, Fisheries and Food (MAFF) are currently carrying out Research and Development (R&D) on nitrogen losses to groundwaters from outdoor pigs which will form the basis for a Code of Good Practice for outdoor pig farming stipulating stocking densities required to prevent pollution. The Agency is in close liaison with this project and will be collaborating to extend the study to cover our concerns with soil erosion. Nationally we are pursuing the possibility of extra powers to deal with problems of this nature.

Current water management practices in particular low winter water levels on the low lying moors are causing long term irreversible changes to the soil structure including permanent peat shrinkage. Farming which relies on artificially low water levels is not sustainable but soil damage may be worsened if farmers switch from cattle to arable and vegetable production. In addition soils in cultivated areas are at risk from erosion in hot, dry and windy conditions.

The Environmentally Sensitive Area (ESA) scheme aims to safeguard agricultural landscapes and maintain traditional farming practices. Many of the initiatives to support biodiversity conservation in the area depend on the sensitive management of agricultural land and water levels.

Agricultural pollution has caused or contributed to non-compliance with RQOs on:

- River Brue Stretches 7, 8, 9, 13
- Decoy Rhine Stretch 22
- River Axe Stretch 33
- River Sheppey Stretches 18, 19
- Hartlake Stretch 23
- River Alham Stretches 28, 29 30

It also contributed to EC Fisheries Directive non-compliance on:

- River Axe Stretches 33, 34

(For key to stretch numbers see Section 12.1).

We will monitor for farm consent compliance to identify unsatisfactory discharges and obtain improvements where required and work with landowners to reduce diffuse pollution.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.6.1 Investigate farm inputs to the North Drain.	Agency	3	●				
8.6.2 Continue with farm visit campaign on the River Alham.	Agency	3	●				
8.6.3 Implement the findings of MAFF's R&D on nitrogen inputs to groundwater from outdoor pigs.	MAFF, Agency	2.5	●				
8.6.4 Implement the Somerset Levels & Moors Water Level Management Strategy.	(See 8.1.1)	-	-	-	-	-	-
8.6.5 Work to establish water level management which sustains the hydrological integrity of peat soils so as to avoid wastage and shrinkage taking into account recommendations in the Silsoe College R&D Report produced for English Nature (EN) in 1997 when contributing to the production of Water Level Management Plans.	Agency, EN, farmers, FWAG (See 8.1.1)	-	-	-	-	-	-

8.7 The impact of sewage treatment works

There are 21 public sewage treatment works (STWs) in the Brue and Axe Catchment. There are no substantial private sewage treatment works but there are five that have a consented Biochemical Oxygen Demand (BOD) load of greater than 0.3 kg/day. We regulate effluent disposal by issuing consents to discharge and carrying out a major programme of monitoring to assess compliance both with the consents and of the receiving watercourse with its RQO.

We are concerned about the impact of Shepton Mallet STW. Shepton Mallet STW receives the trade effluent from a cider factory. In the past the STW has failed its upper tier consent during the apple pressing season. Remedial work has been undertaken at the STW which now complies with its consent. However, the discharge from the STW may still have the potential to cause non-compliance with the RQO in the River Sheppey. This requires further investigation.

The Consultation Report raised concerns about the impact of Wells STW. At present we are unable to quantify the impact of Wells STW on the Keward Brook as monitoring points were inappropriately located. This has now been addressed by setting up two new monitoring points on the Keward Brook to fully establish the effect of Wells STW on downstream water quality, but we must wait until sufficient data is collected before we can assess its impact (end 1998).

Shepton Mallet STW caused or contributed to non-compliance with the RQO on:

River Sheppey Stretches 16, 17

(For key to stretch numbers see Section 12.1).

We are working with Wessex Water Services Ltd (WWSL) to prioritize their expenditure on STWs as part of negotiations for their Asset Management Plan III (AMP3).

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.7.1 Shepton Mallet - continue to monitor the performance of the STW and its impact on water quality in the River Sheppey.	Wessex Water, Agency	10	●	●	●	●	●
8.7.2 Wells - assess water quality data from the new monitoring locations on the Keward Brook in order to gauge the impact of Wells STW on downstream water quality.	Agency	0.3	●	●	●	●	●

8.8 The impact of septic tanks and soakaways

There are many areas within the Brue and Axe Catchment which do not have mains drainage for sewage disposal but which rely on septic tanks and soakaways. Heavy clay soils prevent foul water from soaking away and so may cause pollution of watercourses, for example in Mark, Lympsham, Alhampton, Badgworth and Blackford. New development in such areas is restricted to methods of foul effluent disposal which do not involve septic tanks and soakaways.

Within this catchment first time sewerage has been appraised for the villages of Alhampton and Blackford and these are recognized as priority schemes. Rooksbridge and Weare are also being considered but have been assessed by Wessex Water Services Ltd (WWSL) as lower priority schemes.

Septic tank discharges contributed to non-compliance with the long term RQO on:

River Axe Stretch 36

(For key to stretch numbers see Section 12.1).

Septic tank discharges into or affecting SPA/RAMSAR sites will be reviewed as part of the EC Habitat Directive review, (see 6.1.1).

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.8.1 Identify problematic septic tank discharges particularly those discharging to SSSIs. Through negotiation and legislative powers where necessary, ensure that owners improve the discharges.	Agency, owners	4	●	●			
8.8.2 Investigate and report on septic tank/package plant impact in support of first time sewerage schemes.	Agency	2.5	●				

8.9 The impact of abandoned lead mines

The Mendip Hills were once an important lead mining area although no mining takes place today. Lead is released into the environment in drainage and in runoff from spoil heaps. Downstream from the lead bearing areas river sediments can contain lead and other metals. Disturbing these sediments can make the lead available in the environment again.

We have commissioned some work with Southampton University to look at the toxicity of river silt. The evaluation of the toxicity of river silt was the subject of an undergraduate report written in 1997.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.9.1 Review the environmental consequences of disturbing and disposing of river silts.	Agency	0.4	●				

8.10 Unknown causes of water quality standards non-compliance

Our monitoring has indicated a number of river stretches that did not comply with the RQOs in 1996, for which the reasons are unknown:

River Brue Stretches 4, 5, 6, 7
 Lox Yeo Stretch 42

(For key to stretch numbers see Section 12.1).

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.10.1 Investigate causes of non-compliance and take appropriate action.	Agency	16	●	●			
8.10.2 Investigate reports of inadequate water quality for Bristol Water's Brinscombe abstraction and if required take appropriate action. <i>Costs shown = investigation only.</i>	Agency	2	●				

9. Conserving the Land

The Agency is committed to protecting the land from pollution and erosion and also to minimizing the risk to people and property from flooding.

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 16 conserving the land actions, 13 of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 influence the Town and Country Planning Systems to prevent developments in the wrong places;
- 2 implement the Flood and Coastal Defence policy as advised by the Ministry of Agriculture, Fisheries and Food (MAFF) and the Welsh Office;
- 3 secure an adequate level of investment in flood defence;
- 4 provide floodplain surveys to local planning authorities;
- 5 discourage development in floodplains;
- 6 work with nature to reduce coastal flooding;
- 7 report regularly on the state of flood defences;
- 8 identify the state and extent of the problem of soil erosion;
- 9 develop a soil erosion alleviation strategy, including guidance on best practice;
- 10 work with local authorities to identify, and report on the extent of, contaminated land;
- 11 regulate identified "special" contaminated land sites effectively;
- 12 identify the needs of, and alleviate the effects of, soil acidification in upland areas;
- 13 measure the effectiveness of steps taken to reduce nitrates in designated nitrate vulnerable zones.

9.1

Flooding

The Agency is concerned that the strategic plan allocation of approximately 6,000 new houses in the catchment by 2011 is located where it will neither be affected by flooding nor exacerbate existing flood problems.

We advise local planning authorities on the location of development in relation to flooding matters as consultees to Structure and Local Development Plans. We are supplying detailed indicative floodplain maps (so called "Section 105" maps) to the local authorities to guide their work on steering development away from river floodplains. River flood defences in the Lower Brue valley are mainly to an agricultural standard only and would have to be considerably improved to achieve the Ministry of Agriculture, Fisheries and Food's (MAFF) indicative standard of protection for urban areas before any development could take place in the defended areas.

The coastal strip west of the M5 motorway is slightly higher than the Moors of the lower catchment and so less susceptible to river flooding. However, much of this area could flood if the coastal defences are overtopped or breached. Local residents are concerned that the dunes to the north of Burnham are being eroded by the sea and are increasingly likely to be breached in a severe storm. Coastal flooding matters are dealt with in the Severn Estuary Strategy Joint Issues Report, page 49.

Our Planning Liaison section review and comment on all planning applications which have environmental implications. Nationally we are conducting a one year trial audit of the take up of our requirements in a 10% random sample of those applications to which we object, or ask for conditions to be attached.

9.2 Soil erosion

This is not a major problem in this catchment but we are concerned about possible soil erosion on the Mendips if the intensive outdoor rearing of pigs spreads.

We encourage farmers to follow the Ministry of Agriculture, Fisheries and Food (MAFF) Code of Good Agricultural Practice for the Protection of Soil. MAFF are preparing a Code of Good Practice for outdoor pig farming which is likely to include advice on stocking ratios.

9.3 Nitrate pollution

We are concerned that excess organic and inorganic nitrogen-based fertilizers applied to farmland are either polluting watercourses as surface runoff or percolating through the soil and permeable rock to pollute groundwater. This can sometimes lead to the closure of both public water and private drinking water supplies.

The Government has created Nitrate Vulnerable Zones (NVZ) to protect affected sources and will produce an Action Plan of agricultural measures to achieve reductions in nitrate inputs to the land. There is one NVZ in this catchment at Castle Cary, see Brue and Axe Consultation Report, page 30, section 5.6.

Excess nitrate may also contribute to eutrophication (see 8.3). Other actions to reduce nitrate pollution are included in 8.6 The impact of agriculture.

9.4 Contaminated and derelict land

The Environment Agency has specific duties under the Environment Act 1995 with respect to contaminated land. This is defined as any land which appears to a local authority to be in such a condition - because of the substances it contains - that water pollution or significant harm is being, or is likely to be caused. This interpretation is subject to guidance issued by the Secretary of State. Some sites may become designated as "special sites", and these will become the responsibility of the Agency. None has yet been so designated.

The process of identifying contaminated land in a standard way across England and Wales has yet to commence. Once it does, the Agency has a duty to prepare and publish a report on the state of contaminated land from time to time, or if specifically requested to do so by the Secretary of State.

Periodic surveys have however been made of derelict land. The two, of course, are not the same. Derelict land is considered to be land which has become so damaged by industrial or other developments that it is incapable of beneficial use without treatment. Such land includes closed and disused waste tips, worked-out mineral excavations which are not subject to enforceable planning conditions or other arrangements providing for restoration; abandoned military or service installations; abandoned industrial installations; and areas of land which are affected by actual surface collapse resulting from disused underground mining operations.

9.5

Soil acidification

Some soils, particularly those which are naturally acidic such as granite derived soils and peat soils are vulnerable to increased acidity. This effect is made worse by high rainfall typically in upland areas and also by extensive conifer plantations. If rain combines with certain airborne pollutants it becomes much more acidic and accelerates the process of soil acidification. The main pollutants are sulphur dioxide and the oxides of nitrogen.

The acidification of soil leads to the leaching out of minerals essential for plant growth and many plants cannot survive - others are severely damaged.

The Brue Catchment is unusual in that it contains lowland peat soils in the Moors of the Lower Brue. These soils are vulnerable to increased acidification (see Brue and Axe Consultation Report, page 41, map 10).

In 1994, a protocol was agreed under the UN Economic Commission for Europe (UNECE) to reduce exceedences of critical loads - the rates of sulphur deposition which ecosystems and other targets can tolerate in the long term without suffering damage. The UK agreed to reduce its SO₂ emissions by 80% by 2010 from a 1980 baseline.

The UK's sulphur strategy published in December 1996 (Reducing Emissions of Sulphur Dioxide, A Strategy for the United Kingdom) indicates that the UK will meet interim targets for 2000 and 2005. Compliance is also expected with the 80% reduction target for 2010. Critical load exceedences however will continue at some sensitive sites. In January 1997 the European Commission published a draft strategy on acidification which aims to further reduce critical load exceedences for both sulphur and nitrogen.

There are no breaches of air quality standards known to be caused by authorized Integrated Pollution Control (IPC) processes in the catchment.

10. Waste

The Environment Agency regulates the treatment, recovery, storage, movement and disposal of controlled wastes. Controlled waste includes household, commercial and industrial wastes. It excludes waste from agricultural, mining and quarrying operations, waste water, explosives and radioactive wastes. However, some agricultural and mine and quarry waste may become controlled waste in the near future.

The Government's strategy for sustainable waste management in England and Wales is set out in a White Paper *Making Waste Work*, published in December 1995. This sets out the waste hierarchy:

Reduction
Reuse
Recovery - recycling, composting, energy
Disposal.

The overall objective is to move the management of waste up the hierarchy thus reducing the volume of waste that is finally disposed to landfill. Landfill, however, will remain as a method of solid waste disposal in the UK for wastes that cannot be recovered and for the residue of some recovery methods such as incineration with energy recovery.

Government initiatives to move waste management up the hierarchy include legislative as well as financial incentives. Mechanisms already in place include; the requirement on local authorities to draw up Recycling Plans to detail how household recycling targets are to be met, and the Landfill Tax which was introduced on 1st October 1996. The Producer Responsibility Obligations (Packaging Waste) Regulations were introduced in January 1997 placing responsibility on businesses that handle packaging to recover and recycle certain proportions of packaging materials.

The Landfill Tax is enforced by HM Customs and Excise. There are two levels of tax, £2 per tonne for inactive (inert) wastes and £7 per tonne for all other wastes disposed of at landfill sites. Landfill Tax is levied on the landfill site operators and before VAT is calculated. Site operators can contribute to enrolled Environmental Bodies for specific projects. In return they can claim a tax credit worth 90% of any contribution to a maximum credit of 20% of their landfill tax liability.

We aim to: encourage people to reduce their wastes and for the wastes that are produced promote re-use and recycling.

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 14 managing waste actions, 9 of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 provide a high quality waste regulation service;
- 2 develop an overall database of waste arisings and disposals;
- 3 obtain information on fly-tipping and devise means of combating it;
- 4 implement the "producer responsibility" regulations;
- 5 encourage and inspire industry to develop new and improved techniques for the management of special and other industrial wastes;

- 6 ensure achievement of national waste strategy targets for the reduction of waste disposed of to landfill;
- 7 ensure achievement of national targets for the recovery, recycling and composting of municipal waste;
- 8 secure high quality management of radioactive waste in industry;
- 9 ensure that any proposals for solid radioactive waste disposal will provide the necessary high level of protection for man and the environment.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
10.1.1 Survey waste arisings in the Region (including this catchment) to provide a basis for waste planning and we will feed into a National Waste Strategy Report during 1999.	Agency	Unknown	●	●	●	●	●
10.1.2 Advise waste disposal authorities and local industry on the best practice for waste reduction and disposal. Enforce the new Producer Responsibility Obligations (Packaging Regulations).	Agency	Unknown	●	●	●	●	●

11. Major Industry

One of the Agency's key responsibilities is Integrated Pollution Control (IPC). This process aims to prevent pollutants from major industrial processes being released into the air, water and land. Where releases do occur, we try to make sure they are minimized and made harmless. Regulations made under Part 1 of the 1990 Act identify industrial processes that use or produce potentially harmful substances in significant amounts - known as prescribed processes and substances. Broadly, these are the industrial processes with the greatest potential to cause pollution. The UK was one of the first countries in Europe to introduce such an integrated regulatory system, and many individual processes have now been authorized. A similar approach will be introduced throughout the European Union under the new Integrated Pollution Prevention and Control Directive, which must be transposed into UK law by 31 October 1999.

The IPC approach to pollution control considers releases to all three media (air, water and land) from industrial processes in the context of their effect on the environment as a whole. The option minimizing impact on the environment as a whole is known as the best practicable environmental option (BPEO). Guidance on how to conduct such an appraisal is provided in the Agency's free publication *Best Practicable Environmental Option Assessments for IPC: A Summary*.

In addition, processes have to use the best available techniques not entailing excessive cost (BATNEEC) to prevent or minimize releases of prescribed substances into the environment and render all substances harmless.

Before IPC was introduced, releases of prescribed substances to the different environmental media (air, water and land) were dealt with under distinct sets of rules, enforced by separate regulators. This meant that industries barred from releasing hazardous pollutants into one environmental medium (such as to water in the nearest river) might be able to divert them into another medium where perhaps less stringent rules applied (such as to air by burning or to land by burying them). There was no means of ensuring that industry acted in the way that caused least harm to the environment as a whole.

For prescribed processes, control of releases to air, water and land have now been brought under a single regulatory scheme - IPC, so the effects of these processes on the environment as a whole are properly considered. The system makes the effectiveness of IPC doubly sure by targeting entire industrial processes or sectors - not just listed substances - for systematic regulation.

Where an IPC authorization does not cover the whole of a site, operators may also be subject to separate regulatory permits for aspects of Waste and Water Quality. However, the amalgamation within the Agency of the responsibility for regulations governing those aspects as well as IPC has been a further significant step in ensuring a consistent approach to environmental management.

The Environment Agency is the enforcement authority for England and Wales of the Radioactive Substances Act 1993. This statute is concerned with the keeping, use and disposal of radioactive substances and, in particular, the regulation of radioactive waste disposal.

The major nuclear establishments are licensed to operate by the Nuclear Installations Inspectorate (NII), but discharges from them are authorized by the Agency. These discharges arise from the day-to-day operations at the sites. Site operators are required to ensure that discharge conditions are met and also ensure that radiation dose limits to the public are not exceeded as a result of the discharges.

There are 8 sites in the catchment area which are currently registered under the Radioactive Substances Act. These sites are mainly manufacturing processes using sealed radioactive sources for industrial process control purposes.

The Agency's "An Environmental Strategy for the Millennium and Beyond" (published September 1997) details 18 regulating major industries actions, 14 of which we are contributing to in the Brue and Axe Catchment, and these are listed below.

Locally we will:

- 1 continue the efficient and effective delivery of Integrated Pollution Control;
- 2 implement the requirements of the European Community (EC) Directive on Integrated Pollution Prevention and Control;
- 3 implement the relevant requirements of the Control of Major Accident Hazards Directive;
- 4 develop practical working relationships with fellow regulators, particularly the Health and Safety Executive;
- 5 develop pollution prevention control tools including projects relating regulation to emission, efficiency and economic benefits (3 E's project);
- 6 encourage the use by industry of BS 7750/ISO14001 accreditation;
- 7 encourage registration under the European Union (EU) Ecomanagement and Audit regulations;
- 8 pay special attention to the needs of small and medium sized enterprises;
- 9 maintain and expand the Chemical Release Inventory;
- 10 play a full and active part in the EU Network for the Implementation and Enforcement of Environmental Law;

- 11 ensure that radioactive releases from nuclear sites which result in exposures to individual members to the public are well within accepted limits;
- 12 ensure that the total potential impact of releases from nuclear sites are environmentally acceptable;
- 13 ensure improvements are made to the quality of discharges to estuarine and coastal waters;
- 14 implement the requirements of the EC Urban Waste Water Treatment Directive.

11.1

The impact of the Royal Ordnance factory

Under an agreement set up in 1953 the Environment Agency has inherited the sole responsibility for the operational control and maintenance of the open channel effluent drain from the Royal Ordnance works commonly called the "Acid Ditch", although this title is no longer deserved - see below.

Due to the acidity of the effluent arising from the manufacturing processes operated since the 1940s at the Puriton Ordnance factory, it was discharged to the tidal River Parrett, near the mouth of the Huntspill River, through a clay-lined channel, open for most of its length, although the final section was culverted in the 1980s.

As sole operators of the effluent drain, it is the Agency's duty under the Health & Safety at Work Act and duty of care to consider the risks and safety of the operation in the light of modern management and safety standards.

In the early 1990s the pH of the effluent varied in the range 2 to 9 and also contained toxic organic compounds (pH ranges from zero - very acid to 14 - very alkaline, pH 7.0 is neutral). Immersion in or ingestion of effluent in the lower part of this range would have been unpleasant and possibly dangerous.

The main processes operated by Royal Ordnance became the subject of an Integrated Pollution Control (IPC) Authorization during 1993-5 and as a result of the pressures to make necessary environmental improvements, effluent treatment was implemented prior to the flow entering the Acid Ditch. This involves neutralization, typically to pH 6.5-7.5, followed by low energy input biological oxidation in a large reedbed system. The effluent flowing through the ditch now constitutes a small risk to people and wildlife. Achievement of the full potential of the reedbed system under the IPC Improvement Programme to the level required by the Agency from October 1997 will further lower the toxic organic content which, although it will not remove all risks, will lead to the risk being reduced.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
11.1.1 Continue monitoring the effluent quality to ensure the problem of acidity will not allow an unexpected return to the safety hazard that existed in the early 1990s and before.	Agency	0.5	●				

11.2

The impact of St Cuthberts Paper Mill

Paper processing generates waste effluents with considerable polluting potential. Proper waste minimization and treatment facilities are needed if mills are to achieve good effluent standards. The Agency regulates the discharge of effluents using discharge consents.

The effluent from St Cuthberts Paper Mill occurred or contributed to non-compliance with the RQOs on:

River Axe Stretches 32, 33

It also caused or contributed to non-compliance with the EC Fisheries Directive on:

River Axe Stretches 32, 33

(For key to stretch numbers see Section 12.1).

Actions	Action By	Cost to Agency (£K)	Financial Year					
			98	99	00	01	02	
11.2.1 Continue the programme to remove product in paper production which causes high ammonia.	Mill operator							
11.2.2 Monitor the recently improved biological treatment of effluent to ensure consent compliance.	Agency	1	●	●				
11.2.3 The effluent recirculation trials at the mill have now been completed. An application for a variation to the existing consent has been submitted, and is currently under consideration.	Mill operator, Agency to monitor	0.3	●					
11.2.4 Assess the impact of the effect on the River Axe.	Agency	5	●	●				

12. Appendices

12.1 Our river quality objective targets (RQO)

Stretch Ref. No	River	Stretch	Proposed RQO	Proposed Long Term RQO
1	Huntspill	Gold Corner - Sea	RE 4	
2	South Drain	Source - Avalon Farm	RE 4	
3	South Drain	Avalon Farm - Confluence with Gold Corner	RE 4	
4	Brue	Cogley Wood - Gants Mill	RE 2	
5	Brue	Gants Mill - Cole	RE 2	
6	Brue	Cole - Wadham Farm Stream	RE 2	
7	Brue	Wadham Farm Stream - Confluence with Alham	RE 3	RE 2
8	Brue	Confluence with Alham - D/S Baltonsborough Bifurcation (North)	RE 2	
9	Brue	U/S Baltonsborough Bifurcation - D/S Baltonsborough Bifurcation (South)	RE 2	
10	Brue	D/S Baltonsborough Bifurcation - D/S Glastonbury Mill Stream Bifurcation	RE 3	
11	Brue	D/S Glastonbury Mill Stream - Confluence with Sheppey	RE 3	
12	Brue	Confluence with Sheppey - Confluence with North Drain	RE 3	
13	Brue	Confluence with North Drain - Confluence with Cripps	RE 3	
14	Brue	Confluence with Cripps - Highbridge (Estuary)	RE 4	
15	North Drain	Crossing with Sheppey - Confluence with Brue	RE 4	
16	Sheppey	Shepton Mallet STW - Croscombe STW	RE 3 (2000)	
17	Sheppey	Croscombe STW - Dulcote	RE 3	
18	Sheppey	Dulcote - Garslade Farm	RE 3	
19	Sheppey	Garslade Farm - Confluence with Brue	RE 2	
20	Keward Brook	Keyword - Confluence with Tributary	RE 2	
21	Keward Brook	Confluence with Tributary - Confluence with Sheppey	RE 4	
22	Decoy Rhine	U/S Decoy Rhine - D/S Decoy Rhine	RE 2	
23	Hartlake	Redlake/Whitelake Confluence - Confluence with Sheppey	RE 4	RE 3
24	Whitelake	Confluence with Whitelake Tributary - Confluence with Redlake	RE 3	
25	Brue (GMS)	U/S Glastonbury Mill Stream Bifurcation - D/S Glastonbury STW	RE 3	
26	Brue (GMS)	D/S Glastonbury STW - D/S Glastonbury Mill Stream Bifurcation	RE 4	RE 3
27	Cripps	Confluence with Huntspill (Gold Corner) - Brue Confluence	RE 4	
28	Alham	Alham - Snagg Farm	RE 2	
29	Alham	Snagg Farm - Confluence with Alham Tributary	RE 3	RE 2
30	Alham	Confluence with Alham Tributary - Confluence with Brue	RE 2	
31	Axe	Source - Paper Mill	RE 1	
32	Axe	Paper Mill - U/S Wookey Bifurcation	RE 2	
33	Axe	U/S Wookey Bifurcation - D/S Wookey Bifurcation	RE 2	
34	Axe	U/S Wookey Bifurcation - D/S Wookey Bifurcation (via Wookey STW)	RE 2	

35	Axe	D/S Wookey Bifurcation - Clewer	RE 2	
36	Axe	Clewer - Confluence with Cheddar Yeo	RE 4	RE 3
37	Axe	Confluence with Cheddar Yeo - Confluence with Lox Yeo	RE 4	
38	Axe	Confluence with Lox Yeo - Confluence with Mark Yeo	RE 4	
39	Axe	Confluence with Mark Yeo - Brean (Estuary)	RE 4	
40	Lox Yeo	Source - Winscombe STW	RE 3	
41	Lox Yeo	Winscombe STW - Loxton	RE 4	
42	Lox Yeo	Loxton - Confluence with Axe	RE 5	RE 4
43	Cheddar Yeo	Source - Hythe	RE 1	
44	Cheddar Yeo	Hythe - Hythe Footbridge	RE 2	
45	Cheddar Yeo	Hythe Footbridge - Confluence with Axe	RE 3	

12.2 Area Environment Group

Name	Representing
Mr L R Fortune	Chairman, Appointed by Environment Agency
Ms B Carroll	Regional Environment Protection Advisory Committee
Mr M J Stoodley	Wessex Regional Fisheries Advisory Committee
Mr J R Bush	Wessex Regional Flood Defence Committee
Mr R W Wyatt	Water Resources
Mr S Hemmings	Waste Management
Mr M Hellings	Waste Management
Mr D Fish	Industry
Mr H S Lucas	Industry
Councillor N Jones OBE	Tourism
Mr R G Adlam	Agriculture
Ms J C Brookhouse	Conservation
Mrs A M Lennox	Recreation
Mr J L R Williams	Fisheries
Mr J B H Watkis	Flood Defence
Mrs L Bennett	Local Authority
Mrs N E Kirsan	Local Authority
Mr H P N Temperley	Local Authority
Mr C S W C Newbury	Local Authority
Dr R England	Education

12.3 Steering Group

Name	Representing
Mr I Ham	National Farmers Union
Mr P Hodge	Bristol Water Company
Mr N House	Royal Ordnance Plc
Mr J Mathrick	Fisheries
Dr C Hancock	Somerset Wildlife Trust
Mr R Bradford	English Nature
Mr P Daniel	Wyvern Waste
Capt P Lee	Sedgemoor District Council
Mr R Moon	Somerset County Council
Mr R Shearwood-Porter	Inveresk Plc, St Cuthberts Paper Mill
Mr D Hooper	Mendip District Council
Mr J Comer	Country Landowners Association
Mr N Gibson	British Canoe Union
Mr J B H Watkis	Internal Drainage Boards
Mr I Blair	Wessex Water Plc
Mr R Bond	Somerset Peat Producers Association
Mr C Birks	Chairman

12.4 Organizations responding to the public consultation

National Organizations

British Waterways
 Defence Estate Organisations (Lands)
 The Forestry Authority
 Joint Nature Conservation Committee
 The Ramblers Association (Somerset Area)
 Ministry of Agriculture, Fisheries & Food
 Inland Waterways Association
 The Royal Town Planning Institute
 Office of Water Services (OFWAT)
 National Farmers Union
 British Canoe Union
 The Hawk and Owl Trust
 The Royal Society for the Protection of Birds
 English Nature

Local Authorities

Mendip District Council
 North Somerset Council
 Bruton Town Council
 Somerset County Council
 South Somerset District Council
 City of Wells
 Sedgemoor District Council
 Street Parish Council
 Wookey Parish Council
 Wedmore Parish Council
 Berrow Parish Council
 Sedgemoor District Council (Harbour Master)

Regional and Local Organizations

Somerset Wildlife Trust (2)
 Foster Yeoman Limited
 Country Landowners Association (CLA)
 Upper Brue Internal Drainage Board
 Lower Brue Drainage Board
 Lower Axe Internal Drainage Board
 R L Purchase (Clevedon & District Angling Club)
 Somerset Levels and Moors Partnership

A further four written responses were also received from members of the public.

A copy of the summary report can be obtained by writing to Alan Turner, Team Leader LEAPs (see address inside front fold-out map).

12.5 Guide to Consultation Report and Action Plan issues

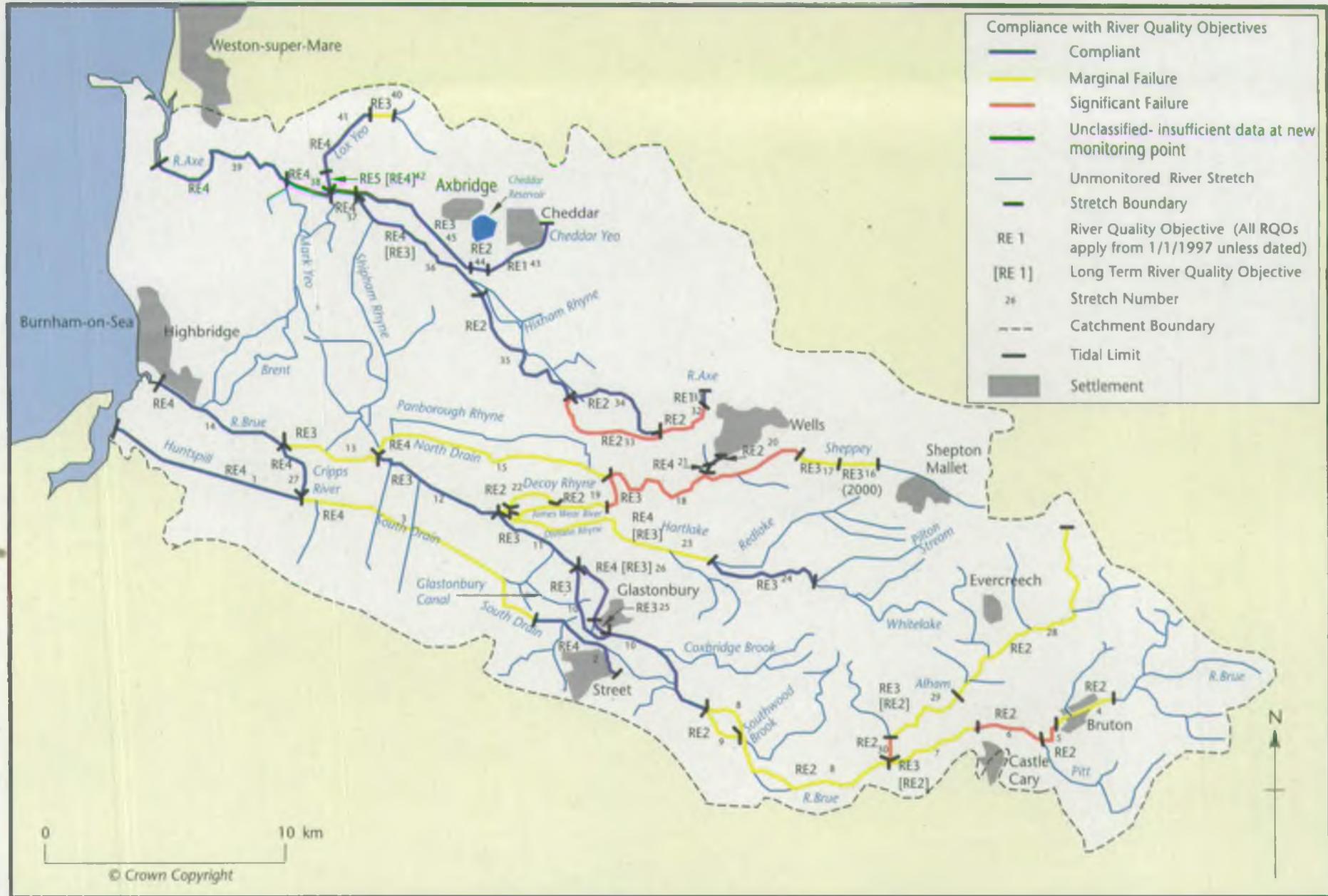
Former Consultation Report Issue	Heading number in this Action Plan
3.1 The impact of abstraction, penning and field irrigation	8.1
3.2 The impact of river canalization and maintenance	8.2
3.3 Eutrophication	8.3
3.4 Use of Environment Agency owned land	8.4
3.5 Maintaining and enhancing biodiversity	6.1
3.6 The impact of the Royal Ordnance factory	11.1
3.7 Securing future public water supplies	5.1
3.8 The impact of peat extraction	8.5
3.9 The impact of agriculture	8.6
3.10 The impact of sewage treatment works	8.7
3.11 The impact of septic tanks and soakaways	8.8
3.12 The impact of St Cuthberts Paper Mill	11.2
3.13 The impact of abandoned lead mines	8.9
3.14 Development pressure	9.1

13. Useful Publications

- A Guide to Information Available to the Public, Environment Agency
- Action for Biodiversity in the South-West - a series of habitat and species plans to guide delivery. June 1997. ISBN 0903138972
- "Air Quality A to Z" June 1995 Meteorological Office and Air Quality Division, Department of the Environment (DoE) ISBN 0861803175
- An Environmental Strategy for the Millennium and Beyond, HO-9-97-100K-D-BABF
- Avalon Marshes - Countryside Stewardship Special Project Proposal, Somerset County Council et al, 1996
- Control of Pollution Act 1974
- Control of Pollution (Amendment) Act 1989
- DoE Circular 30/92 Development and Flood Risk
- EC Directive Concerning the Quality of Bathing Water (76/160/EEC)
- EC Directive on Pollution Caused by the Discharge of Certain Dangerous Substances into the Aquatic Environment (76/464/EEC)
- EC Directive on Freshwater Fish (78/659/EEC)
- EC Directive on the Conservation of Wild Birds (79/409/EEC)
- EC Directive on the Protection of Groundwater against Pollution Caused by Certain Dangerous Substances (80/68/EEC)
- EC Directive Concerning Urban Waste Water Treatment (91/271/EEC)
- EC Directive on Species and Habitats (92/43/EEC)
- EC Directive Concerning the Protection of Waters Against Pollution Caused by Nitrates From Agricultural Sources (91/676/EEC)
- EC Surface Water Abstraction Directive (75/440/EEC)
- EC Directive Air Quality Standards for Nitrogen Dioxide (85/203/EEC)
- Environmental Protection Act 1990
- Guidance for the Control of Invasive Plants near Watercourses, Japanese Knotweed, Giant Hogweed and Himalayan Balsam. HO-9/94-20k-C-AKVI
- Health and Safety at Work Act
- HMSO (1980) The Control of Pollution (Special Waste) Regulations. SI 1709
- HMSO (1986) Control of Pesticide Regulations. SI 1510
- HMSO (1989) Sludge (Use in Agriculture) Regulations. SI 1263
- HMSO (1990) Code of Practice for the Safe Use of Pesticides on Farms and Holdings. MAFF
- HMSO (1992) Code of Good Agricultural Practice for the Protection of Air. MAFF/WOAD
- HMSO (1993) The Forests & Water Guidelines
- HMSO (1993) Code of Good Agricultural Practice for the Protection of Water. MAFF/WOAD
- HMSO (1993) Code of Good Agricultural Practice for the Protection of Soil. MAFF/WOAD
- HMSO (1994) Waste Management Licensing Regulations. SI 1056
- HMSO (1995) Making Waste Work. Department of the Environment and The Welsh Office
- HMSO (1995) Biodiversity: the UK Steering Group Report. London, 2 Vols.
- HMSO (1996) The Special Waste Regulations. SI 972
- HMSO (1996) A Review of the Potential Effects of Climate Change in the United Kingdom. UK Climate Change Impact Review Group
- Land Drainage Act 1991
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Map 2 - Compliance with River Quality Objectives



Information correct as of January 1998 based on 1996 River Ecosystem Classification Data

MANAGEMENT AND CONTACTS:

The Environment Agency delivers a service to its customers, with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

Head Office is responsible for overall policy and relationships with national bodies including Government.

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS12 4UD
Tel: 01454 624 400 Fax: 01454 624 409

ENVIRONMENT AGENCY REGIONAL OFFICES

ANGLIAN

Kingfisher House
Goldhay Way
Orton Goldhay
Peterborough PE2 5ZR
Tel: 01733 371 811
Fax: 01733 231 840

SOUTHERN

Guildbourne House
Chatsworth Road
Worthing
West Sussex BN11 1LD
Tel: 01903 832 000
Fax: 01903 821 832

NORTH EAST

Rivers House
21 Park Square South
Leeds LS1 2QC
Tel: 0113 244 0191
Fax: 0113 246 1889

SOUTH WEST

Manley House
Kestrel Way
Exeter EX2 7LQ
Tel: 01392 444 000
Fax: 01392 444 238

NORTH WEST

Richard Fairclough House
Knutsford Road
Warrington WA4 1HG
Tel: 01925 653 999
Fax: 01925 415 961

THAMES

Kings Meadow House
Kings Meadow Road
Reading RG1 8DQ
Tel: 0118 953 5000
Fax: 0118 950 0388

MIDLANDS

Sapphire East
550 Streetsbrook Road
Solihull B91 1QT
Tel: 0121 711 2324
Fax: 0121 711 5824

WELSH

Rivers House/Plas-yr-Afon
St Mellons Business Park
St Mellons
Cardiff CF3 0LT
Tel: 01222 770 088
Fax: 01222 798 555



For general enquiries please call your local Environment Agency office. If you are unsure who to contact, or which is your local office, please call our general enquiry line.

**ENVIRONMENT AGENCY
GENERAL ENQUIRY LINE**

0645 333 111

The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water.

**ENVIRONMENT AGENCY
EMERGENCY HOTLINE**

0800 80 70 60



**ENVIRONMENT
AGENCY**



**North Wessex Area
Rivers House
East Quay
Bridgwater
Somerset
TA6 4YS**