

FOR NRA ENVIRONMENTAL QUALITY COMMITTEE USE ONLY

**WATER QUALITY 2000 - A STRATEGY FOR THE WATER QUALITY
FUNCTION**

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Comments from EQ Managers have been incorporated into the text. A version with full appendices is being produced.

WATER QUALITY 2000

A STRATEGY FOR THE WATER QUALITY FUNCTION

National Rivers Authority

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ENVIRONMENT AGENCY



136185

MISSION STATEMENT

The National Rivers Authority will protect and improve the water environment. This will be achieved through effective management of water resources and by substantial reductions in pollution. The Authority aims to provide effective defence for people and property against flooding from rivers and the sea. In discharging its duties it will operate openly and balance the interests of all who benefit from and use rivers, groundwaters, estuaries and coastal waters. The Authority will be businesslike, efficient and caring towards its employees.

AIMS

The Authority's aims are as follows:

- To achieve a continuing improvement in the quality of rivers, estuaries and coastal waters, through the control of water pollution.
- To assess, manage, plan and conserve water resources and to maintain and improve the quality of water for all those who use it.
- To provide effective defence for people and property against flooding from rivers and the sea.
- To provide adequate arrangements for flood forecasting and warning.
- To maintain, improve and develop fisheries.
- To develop the amenity and recreational potential of waters and lands under NRA control.
- To conserve and enhance wildlife, landscape and archaeological features associated with waters under NRA control.
- To improve and maintain inland waterways and their facilities for use by the public where NRA is the navigation authority.
- To ensure that dischargers pay the costs of the consequences of their discharges, and as far as possible to recover costs of water environment improvements from those who benefit.
- To improve public understanding of the water environment and the NRA's work.
- To improve efficiency in the exercise of the NRA's functions and to provide challenge and opportunity for employees and show concern for their welfare.

WATER QUALITY 2000

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Water Quality 2000

A Strategy for the Water Quality Function

1 PREFACE

Water Quality is high on the NRA's agenda. In order to achieve our aims we shall need to bring about a continuing improvement in the waters under our control.

In particular we must:

- ensure that the quality of surface waters is improved and maintained so that their uses are assured. The rivers and estuaries of the poorest quality must be cleaned up;
- protect groundwaters so that they are always suitable for the supply of drinking water, and for industrial and agricultural use; and
- ensure that those who are responsible for causing pollution take or pay for all the actions necessary to restore water quality.

In order to do this we must:

- introduce water quality objectives for all waters for which we have responsibility;
- set up and implement a system of catchment planning. This will assist in the achievement of water quality standards by identifying the needs of each catchment and allow us to plan appropriate action;
- determine the relative impact of all the causes of poor water quality in each catchment - known as catchment accountability;
- set up systems for controlling these causes; and
- develop economic incentives as a basis for pollution control.

The strategy that follows addresses these goals.

2 FUNCTION DESCRIPTION

- 2.1 The Water Quality Function of the NRA is concerned with achieving the statutory duties concerning water quality held by the NRA, through the use of its powers in relation to pollution control. These are described in Section 3.
- 2.2 Quality is a vital characteristic of the nation's water resource. Water quality management is directed at ensuring that the quality of water is suitable for its uses, such as public supply; wildlife conservation; fisheries; agriculture; industry; amenity; recreation and waste water disposal. There are, therefore, very close links between the Water Quality Function and the Water Resources, Fisheries, Conservation, and Recreation Functions, and also with the Flood Defence Function because of the possible impact of engineering works on quality.
- 2.3 The Function forms part of the overall responsibilities of the Chief Scientist. There is a small policy team at Head Office led by the Head of Water Quality. Each Region has an Environmental Quality Manager reporting to the Regional General Manager but with a functional link to the Chief Scientist.
- 2.4 Links between Head Office and the Environmental Quality Managers operate through the Environmental Quality Committee which is concerned with developing advice on water quality policy and practice, and on co-ordinating its implementation across the Regions. The Committee is chaired by the Head of Water Quality and is composed of the ten Environmental Quality Managers with the Chief Scientist in attendance.
- 2.5 The Environmental Quality Committee has a number of sub-groups reporting to it. At present these are:

- Farm Waste;
- Laboratory Managers;
- Mathematical Modelling and Data Analysis ;
- North Sea Group;
- Public Register;
- Sampling Programmes ;
- Aquifer Protection (also reporting to the Water Resources Committee);
- Water Quality Survey; and
- Biology.

An Environmental Quality Manager also represents the Committee on the R&D Committee.

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- 2.6 The organisation of work concerning water quality varies in detail in each Region but the main components are as follows. Each Region has a field staff of "Pollution Control" officers concerned with the monitoring of waters and effluents, discharge consent formulation and enforcement, pollution prevention and the handling of pollution incidents and emergencies. They are supported by biologists, analytical chemists, consent administration staff and scientists involved in water quality planning and data analysis. Staff working on building development control also have an important impact on water quality protection.
- 2.7 To ensure impartiality the NRA is virtually self-sufficient in analytical facilities and a network of eleven large chemistry laboratories has been developed. The Function is a major user of information systems, and its data handling requirements include the statutory public register of consent and monitoring information. The Function also receives support from NRA's legal services, particularly for pollution prosecutions.

3 PURPOSE

BACKGROUND

- 3.1 The NRA was formed as a result of the Water Act (1989); it inherited responsibility for the control of pollution in controlled waters from the former Water Authorities on 1 September 1989. 'Controlled waters' means surface freshwaters, underground waters and tidal waters to the three-mile limit in England and Wales.
- 3.2 The Water Quality Function exists to carry out these responsibilities.

LEGISLATION

3.3 Water Resources Act 1991

Those aspects of the 1989 Water Act which concerned the NRA were consolidated into the Water Resources Act in December 1991. Under this new Act the NRA has statutory duties and responsibilities relating to the quality of the aquatic environment which are both general and specific. A *general* duty is imposed on the NRA to conserve and enhance the natural beauty and amenity of inland and coastal waters, and of land associated with them. The NRA is also *specifically* responsible for water quality in all controlled waters. These duties and responsibilities are explained more fully in paragraph 3.7.

3.4 European Community Directives

The NRA also acts on behalf of Her Majesty's Government as the competent authority for certain European Community (EC) Directives.

It has responsibilities under 18 Directives and is also the competent body for carrying out certain obligations placed on the UK as a result of inter-governmental agreements - primarily those relating to the control of pollution of the North Sea.

3.5 Control Of Pollution Act 1974

Part 1 of the Control of Pollution Act concerning solid waste disposal remains in force and the NRA has an important consultee role to play in this.

3.6 Environmental Protection Act 1990

The Environmental Protection Act 1990 introduced the concept of Integrated Pollution Control for processes which use the most dangerous substances and these will be authorised by Her Majesty's Inspectorate of Pollution. The NRA is a statutory consultee, and has considerable influence on such authorisations where water quality is affected.

3.7 Water Resources Act 1991: Specific Responsibilities

In order to meet its responsibilities, the NRA has powers to control and remedy pollution. Many of these were contained in earlier legislation and were brought together and in some cases extended by the Water Act 1989, and subsequently the Water Resources Act 1991.

- Section 2 of the Act requires the NRA to promote the conservation and enhancement of the natural beauty and amenity of inland and coastal waters and associated land, the conservation of flora and fauna, and their use for recreational purposes.
- The most far reaching provisions of the Act are contained in Sections 82 and 83 which give power to the Secretary of State for the Environment to set up a system of classifying water quality and establishing Water Quality Objectives for controlled waters. Section 84 then requires the NRA to use its powers to ensure that these are achieved, and also places an obligation on the NRA to monitor the extent of pollution in controlled waters.
- Sections 85 to 90 set out the offences relating to the pollution of controlled waters and discharging effluents without the consent of the NRA, and the NRA has to enforce those provisions.

A number of defences and exceptions are set out in Sections 88 and 89. These include compliance with a discharge consent, certain emergency situations and discharges from abandoned mines.

- Section 88 and Schedule 10 of the Act allow the NRA to issue consents for discharges of sewage effluent, trade effluent and other matter to controlled waters. The precise procedures to be followed are described in the Act and these include a requirement for the NRA to advertise applications for consent so that members of the public can make their views known.
- Applications for consents to discharge, records of consents given, samples of water or effluent, and any related information must be entered on a Register which the NRA has to maintain and make available to the public under Section 190.

- The NRA may recover the cost - by charging - for the issuing of consents, but any charging scheme has to be approved by the Secretary of State. Such a scheme was introduced in October 1990. The NRA may also recover the costs - again by charging - for its work carried out in relation to monitoring the nature of effluents and the impact they have on the receiving environment.

- Section 92 enables the Secretary of State to issue regulations for those who have custody or control of poisonous, noxious or polluting matter, to take precautionary measures to prevent pollution from them. The NRA itself can make bye-laws under Section 210 to prohibit washing and cleaning activities in controlled waters, and the use of sanitary appliances on vessels. It can also carry out works and operations under Section 161 to prevent pollution occurring and, except for waste water from abandoned mines, can recover the costs of this work from the polluters.

This Section also allows the NRA to remove or dispose of the polluting matter, remedy or mitigate its presence, and restore the water to its previous condition. Again, any reasonable costs incurred may be recovered by the NRA.

- The Secretary of State can, if asked by the NRA or a water undertaker, under Section 93, designate water protection zones and prohibit certain activities within them. A special case is that of designating nitrate sensitive areas (Section 94) for which the Secretary of State and Minister of Agriculture, Fisheries and Food have responsibility. Both the Secretary of State and the Minister may also after consultation with the NRA, approve codes of good agricultural practice under Section 97.

4 KEY ISSUES

4.1 Statutory Water Quality Objectives

The proposal to set Statutory Water Quality Objectives (SWQOs) is one of the cornerstones of the Water Act and represents a joint plan between the Secretary of State and the NRA to ensure that controlled waters will be of sufficient quality for their designated use.

4.1.1 Setting and Achievement of Statutory Water Quality Objectives

The setting and achievement of Statutory Water Quality Objectives for all controlled waters from 1992 onwards is fundamental to improving water quality. These will build upon the system of quality objectives for rivers, canals and some estuaries which the NRA inherited from the former Water Authorities and which guides water quality management until the new system is in place.

The NRA and the Secretary of State need to devise a simple, robust yet scientifically justifiable set of water quality objectives which can be applied throughout England and Wales.

Achievement of SWQOs will depend upon the full use of the NRA's powers; upon co-operation from other government departments and non-governmental bodies whose activities and responsibilities impinge upon the aquatic environment; and upon the public and industry who will have to make the necessary investment.

4.1.2 Determination of Environmental Quality Standards

In order to meet and assess compliance with SWQOs sensible and practical Environmental Quality Standards (EQSs) have to be determined for the various uses contained within the SWQOs. Appropriate EQSs do not yet exist for many uses due to lack of appropriate knowledge. At present, their development is being addressed primarily through the NRA's Research and Development programme. Funding of this research is therefore critical to the assessment of compliance with SWQOs. Until agreement on the scheme is reached, development of EQSs cannot be progressed further. The NRA will, in any case, look to the DoE for guidance on standards relating to matters of public health (eg, bacteriological standards for bathing waters).

4.1.3 Review of Water Quality Objectives

Water Quality Objectives must be reviewed on a regular five-yearly basis. Standard methods for monitoring and reporting procedures will have to be developed by the NRA to ensure inter-Regional comparability before the review process begins.

4.1.4 Catchment Management Plans

The achievement of compliance with SWQOs is expected to be improved by the use of multifunctional catchment management plans which will have to be developed by the NRA. These will enable the local priorities and strategies required to meet the SWQOs to be developed.

4.2 EC Directives and Intergovernmental Agreements

The NRA acts as the "competent body" for some 18 EC Directives and for carrying out certain obligations placed on the UK Government as a result of inter-governmental agreements. Although agreement to undertake these obligations is effectively outside the NRA's control, they can significantly affect the use of resources and influence other strategic aims. The NRA needs to improve its input to and influence of future Directives and agreements in order to protect its aims and interests.

4.3 Pollution Prevention and Control

Four aspects of pollution prevention and control: regulation of point sources; prevention of diffuse sources; alleviation of pollution incidents; and the control of building developments, need to be linked together into a basic strategy to ensure effective catchment control and achievement of SWQOs. The major issues are as follows.

4.3.1 Pollution Control Measures

New and stronger regulations are required to control and prevent pollution from high risk, diffuse sources. Some statutory Regulations have already been issued (eg, farm silage, slurry and fuel oil). Other regulations have been proposed (eg, covering timber preservatives, pesticides and other chemicals stored in bulk) and are with the DoE. When issued, they will need to be implemented by the NRA.

4.3.2 Review of Consents

The NRA inherited a wide range of discharge consents, with varied and sometimes ambiguous content, which it needs to overhaul. Recommendations on procedures and techniques for the determination of new consents and the revision of existing consents are required. The resource implications for this exercise are substantial.

4.3.3 Enforcement Policies for Breaches of Consent

The NRA has developed and implemented a general approach to the categorisation of environmental pollution events and the appropriate action required. Interim guidelines for enforcing breaches of consent have been developed, although the great variations in the nature of consents, as highlighted in 4.3.2, and the presence of many with absolute conditions makes consistent enforcement difficult. The approach to the enforcement of breaches of consent for industrial discharges will be complicated by the introduction of Integrated Pollution Control.

4.3.4 Control of Building Developments

The NRA needs to respond to major developments (eg, barrages) in order to protect its statutory responsibilities and prevent pollution problems. The evaluation of application for planning permission under the Town and Country Planning Act is a very important component of the work to prevent pollution occurring in the first place. Standard procedures and guidelines need to be developed to ensure consistency with respect to the NRA's response to local developments and Environmental Impact Assessments.

4.3.5 Recovery of Costs

In order to maintain its revenue base and to pursue the principle of the polluter pays, the NRA has to recover its costs. Policies for charging dischargers need to be developed beyond the initial scheme now in place. Recovering costs which have been expended in cleaning up pollution from the polluters is an important but legally complex issue which needs to be addressed and resolved.

4.3.6 Contaminated Land

Pollution of surface and groundwater by leachate and run-off from contaminated land is a major area of concern identified by the Royal Commission on Environmental Pollution. Databases on contaminated land need to be acquired and/or developed, and procedures must be drawn up for the assessment of potential and actual impact on water use. The complex legal procedures for the recovery of costs of remedial work from the polluter also need to be addressed.

4.3.7 Abandoned Mineworkings

Discharges from abandoned coal ore and other mineral workings give rise to serious pollution which is outside of the NRA's legal control. Other problems result from the changes to flow regimes on the cessation of pumping minewater. Resources are required to deal with pollution from old mineworkings plus statutory provisions to ensure that "aftercare" measures are taken when existing workings are eventually closed.

4.3.8 External Liaison and Public Awareness

The support and assistance of industry, the media and the general public, particularly with respect to pollution control and prevention, are essential to the NRA. Continued efforts need to be expended on information campaigns and external liaison and on education at the primary, secondary, tertiary and extra mural levels.

4.3.9 Integrated Pollution Control - Environmental Protection Agency

The NRA's consenting role is complicated by the introduction of a system of Integrated Pollution Control (IPC) which has resulted in a Memorandum of Understanding between the NRA and Her Majesty's Inspectorate of Pollution (HMIP). Further complications may arise from governmental proposals to establish an Environmental Protection Agency, the implications of which are not yet clear for the NRA.

4.4 **Quality Assessment and Reporting**

New methods for monitoring, assessment of compliance with standards and surveillance of water quality need to be developed to take account of the introduction of statutory quality objectives, and new methods for consenting discharges. The use of data obtained from these methods needs to be rationalised and information and interpretation made available in an understandable form to government and the public.

4.5 Development of Support Services

The NRA inherited a variety of laboratory facilities, survey equipment and other support service facilities from its predecessor organisations, many of which were inadequate to meet the needs of the organisation. Investment in the development of a self-sufficient national network of NRA laboratories is ongoing and further services (eg, modelling facilities, survey vessels and equipment, biological and toxicological units, planning liaison) with development of Regional centres of expertise where appropriate, is required.

4.6 Emergency Procedures

In order to minimise damage to the environment from pollution incidents etc, and to respond efficiently and effectively to emergencies, inherited procedures need to be developed further and implemented in a consistent way throughout the NRA.

4.7 National Database Development

The NRA inherited data handling systems and databases of varying quality, quantity and accessibility. In order to meet the national and Regional reporting requirements in an effective and efficient manner a National Database needs to be developed. This will require substantial investment in inter-regionally compatible information systems and technology.

4.8 Output and Performance Measures

Information on the performance of the NRA against its strategic aims and with respect to defined standards of service, are essential for justification of funding and to ensure other forms of cost recovery are adequate and justifiable. The development of suitable performance measures and monitoring procedures needs to be addressed, and is in hand.

5 FUNCTIONAL STRATEGY

PRESENT POSITION ON STRATEGIC ISSUES:

5.1 Water Quality Objectives

The Secretaries of State have agreed with the NRA as a first step that the NRA should consult, publicly, on options for the nature and introduction of a new system, and then put proposals forward. The NRA published its consultation document in December 1991 and awaits the response.

The suggested scheme incorporates for each water a "use" related objective, adherence to any EC Directives applicable to that water, and a proposal for a general classification scheme is made incorporating standards for key chemical parameters together with a biological measurement.

In order to set a baseline against which to assess improvements in river and estuarine water quality, the NRA has extended the 5-yearly river water quality survey to include a biological element. The reports on the quality of rivers are thus being published in two parts, the first is a report (published in January 1992) using the agreed criteria which have been used in the past, in order to achieve comparisons with the last survey in 1985; the second will be a report published in mid-1992 which includes the biological input as an "override" to the chemical data - to gain a better picture of the overall health of each river stretch.

5.2 Environmental Quality Standards

The development of Environmental Quality Standards is being addressed primarily through the NRA's Research and Development programme, but cannot be fully realised until the DoE has clarified its position on Statutory Water Quality Objectives. The DoE is in the process of setting Environmental Quality Standards for those dangerous substances which appear in EC directives and as a result of other international agreements. The UK extended "Red List" of substances which will fall within IPC and are also covered by the recent North Sea Declaration are included in this process. For guidance on standards relating to matters of public health, the NRA would look to the Department of the Environment and the Department of Health. It has however, challenged the epidemiological basis of the values used in the EC Bathing Water Directive, a view supported by the House of Commons Select Committee on the Environment, and, with the Department of Health and the Department of the Environment, the NRA is co-funding studies on this subject.

5.3 Catchment Management Plans

Following a report produced in 1990 by a working group examining this issue, pilot plans for limited catchments are being used in each Region to gain experience of the use of such techniques.

5.4 Pollution Prevention Measures

The Water Act allows for general pollution prevention measures to be introduced by Regulations under the Water Resources Act. The first set - on the storage of farm silage, slurry and fuel oil - has been issued. The NRA has also asked the DoE to set in hand the preparation of regulations to cover similarly the storage of oil on industrial premises. As further regulations are produced, they will also have to be implemented: the NRA will need to judge the balance necessary, in terms of resources, between this and other means of improving water quality. A broad-brush review of water quality problems has been produced for the Royal Commission on Environmental Pollution; this identified a number of issues. Of particular concern were farm waste, contaminated land (including waste disposal sites) and polluting discharges from abandoned mines. A report has been published by the NRA on farm wastes in January 1992. A particular problem with contaminated land has been the lack of information: the NRA has therefore sought, and obtained, power in the Environmental Protection Act (EPA) so that Registers of current waste disposal sites, and of previously contaminated land, will be locally available.

Work has begun to implement the recommendations of *Discharge Consent and Compliance: A Blueprint for the Future* - a report published in 1990 which sets out new principles for setting and revising consents.

A complication to the NRA's consenting role is the introduction from April 1991 onwards of a system of integrated pollution control under the EPA. A Memorandum of Understanding has been drawn up with Her Majesty's Inspectorate of Pollution, which has the responsibilities for bringing in IPC; this delineates the boundaries between the two organisations and areas of responsibility, and covers cost recovery arrangements for the NRA. The first tranche of authorisations in 1991 has proved that considerable effort is required to achieve the right input from NRA.

5.5 Environmental Monitoring Programmes

Enforcement policies for different categories of polluting events, and for breaches of consent, have varied in the past from region to region. Categories of environmentally polluting events have now been defined together with a general approach to enforcement action, but a general approach to breaches of consent - particularly for industrial discharges - has yet to be finalised, and this will be complicated by the introduction of Integrated Pollution Control.

5.6 Quality Assessment and Reporting

Effluent and environmental monitoring programmes are being reviewed to bring in consistency and to ensure that the NRA is carrying out the correct level of monitoring to meet its needs. At present virtually all of its monitoring programmes utilise spot samples taken at either the effluent outfall, or a sampling point in the watercourse, although we have indicated enthusiasm for the use of automatic monitors wherever possible. The NRA has been keen to promote the evolution of hand-held monitors and the first order for an instrument designed to an NRA specification was placed in January 1992; the in-house development of a mobile sampling and analysis station which can operate in remote situations for period of time up to three months has resulted in the commercial production of such a machine. These developments will enhance the efficiency and effectiveness of spot sampling techniques by allowing the spot samples to be better targetted. Investigations into the possible role of aerial surveillance are also under way.

Results of sampling programmes are made available on the Water Resources Act public register, as raw data. The NRA is engaged in interpreting these data and are bringing forward a series of water quality reports for publication to enable the public to have a greater understanding of the data.

5.7 National Database

Setting up a National Database so as to assist in preparation of national reports requires substantial investment in Information Systems and Technology, which is currently being addressed. In the past, information on compliance with EC Directives had been sent direct from the Water Authorities to the DoE. These, and other relevant data, are now collated by Head Office prior to submission to the DoE - otherwise only the DoE would have a national picture of the NRA's work in this area. Related information, on the quality of controlled waters, on polluting events, consents, prosecutions and so on, is also being collated centrally in order to appraise the NRA's overall performance, its regional diversity, and to respond nationally to Parliament and the media but Regions also need a suitable database for operational and local reporting.

FUTURE POSITION ON STRATEGIC ISSUES

5.8 Water Quality Objectives

Water Quality Objectives will be set for all controlled waters which include groundwaters, surface waters, lakes and reservoirs, estuaries and coastal waters. The objectives will initially be set as short term (3-5 years) achievable targets but with the longer term objectives kept firmly in mind.

To assist in achieving Statutory Water Quality Objectives, a system using multifunctional Catchment Management Plans will be developed and brought into use on a rolling programme basis. Such plans will take account of all the uses of the waters within a catchment and activities which affect them and will be an essential tool for the development and determination of SWQOs. The most cost effective means of achieving Statutory Water Quality Objectives whilst considering potentially conflicting uses and priorities will have to be taken into account.

Environmental Quality Standards will be developed for all uses incorporated in the SWQOs. Suitable Environmental Quality Standards and Water Quality Standards do not currently exist for all the defined uses covered by the SWQOs. This has begun to be addressed by the NRA through a substantial R&D Programme.

Water Quality Objectives will be reviewed on a regular five yearly basis and the NRA will need to develop standard monitoring strategies and routine methods of reviewing achievement of SWQOs which are comparable throughout the country. Initially, emphasis will be placed on developing strategies for groundwaters and coastal waters, as the monitoring and reporting on the quality of rivers and estuaries are already in existence. Changes will be brought in by the Secretary of State.

5.9 Pollution Prevention and Control

The four aspects of pollution prevention and control which will be exercised to ensure that catchment control can be used to meet the Water Quality Objectives are as follows.

5.9.1 Regulation of Point Sources

Discharges from point sources account for a large proportion of the polluting load entering controlled waters. Water Quality Objectives can only be achieved with adequate control of these discharges. A strong enforcement policy will be implemented using the regulation and consenting procedures of the Water Resources Act. The strategy for regulation will be as follows. The NRA will:

- use the Local Authority planning process to control developments which may lead to adverse point source discharges;
- review and determine all inherited consents, taking into account statutory requirements of Environmental Quality Objectives and Regulations under the Water Act enacting quality requirements from European Directives;
- develop procedures for controlling intermittent discharges, particularly storm sewage overflows;
- produce a "Consenting Manual" for the implementation of the proposals set out in the *Blueprint* Report;
- prosecute dischargers consistently or significantly contravening their discharge consent conditions;
- maintain and update the consent register;
- control nutrient levels using the guidelines in the EC Urban Waste Water Treatment Directive, where appropriate, in order to control and reduce eutrophication and protect designated ecosystems;

- ensure that Water Quality Objectives are taken fully into account before authorisations for prescribed processes are set by well-integrated liaison with HMIP on a local basis using as a basis the Memorandum of Understanding agreed between the two organisations; and

- maintain links with other regulatory organisations such as MAFF, HSE, Waste Disposal Authorities and Local Authorities to ensure that point source pollution is controlled wherever possible.

5.9.2 Identification and Prevention of Diffuse Sources

Pollution from diffuse sources is less easily controlled. Discharges do not enter the environment at a single point and are often intermittent in nature. They cannot be sampled by conventional means, although biological techniques may be more applicable. The NRA will:

- press for Regulations to require control by those persons having custody of poisonous, polluting and noxious matter. Other materials requiring this approach are, in the first instance, for industrial fuel oil, stored pesticides, wood preservatives and polyelectrolytes;
- take action where an actual or perceived pollution risk exists, and seek to recover costs in those cases where remedial work has to be carried out to prevent pollution;
- develop a policy for the identification of protection zones to be designated under the Water Resources Act including zones for protecting groundwater, and take account of these in catchment planning;
- identify the activities to be prohibited or controlled, and develop enforcement procedures for protection zones;
- review the effectiveness of the ten designated nitrate sensitive areas and recommend other sites as necessary;
- identify aquifers susceptible to contamination to develop additional pollution prevention programmes in sensitive catchments;
- create and maintain registers of contaminated land in conjunction with Local Authorities, including details of old waste disposal sites and abandoned mines which have the potential to pollute water;
- develop procedures for the assessment of pollution of surface and groundwater by contaminated land run-off and/or leachate;

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- seek to prevent potential pollution from the redevelopment of contaminated land through the local authority planning liaison process.
 - maintain links with local groups and national bodies such as the Tidy Britain Group to ensure watercourses are cleared of litter and then kept clean;
 - develop the use of biological surveillance techniques as a more effective means of identifying intermittent or diffuse sources of pollution; and
 - seek further powers to influence land use changes (eg afforestation) which may prove detrimental to water quality.

5.9.3 Alleviation of Pollution Incidents

The NRA has powers to carry out work to alleviate the effects of pollution and subsequently to recharge the costs if the polluter is identified. However, many incidents cause significant damage before they are identified and the NRA strategy in this area will be directed towards possible prevention actions advising on good practice and early identification of incidents. The NRA will:

- maintain strong links with other Government departments (MAFF, HSE, HMIP) to promote legislative control of activities and materials which could cause pollution;
- maintain links and inputs into major trade and regulatory organisations such as BASIS (British Agrochemical Standards Inspection Scheme) to recommend action to prevent the escape of pollutants in the event of accidents from major agricultural and industrial stores;
- instigate regional and national campaigns to educate other potential polluters on the dangers of pollution, and the means to reduce the risks of accidental pollution;
- investigate the possibilities of using automatic detection and alarm systems in sensitive areas;
- liaise with the emergency services to obtain information on pollution incidents; and
- seek to develop public awareness of pollution incidents procedures and provide effective and efficient communication facilities for them to use.

5.9.4 Control of Developments

Development Schemes (eg, estuarine barrages and other civil engineering works) often have significant implications for water quality and require substantial resources to respond effectively. The requirement to produce Environmental Impact Assessments (EIAs) and Statements for such developments gives the NRA an opportunity to prevent potential problems in a proactive way. The NRA will:

- seek to prevent potential problems caused by developments by active involvement in determining the requirements of EIAs;
- aim to develop the appropriate procedures and techniques (eg, modelling skills) required for the assessment of the implications of major developments and for the auditing of Environmental Statements.

5.10 Quality Assessment and Reporting

The collation and analysis of samples may be undertaken for a variety of reasons all of which are loosely referred to as monitoring. In this document monitoring is regarded as those activities carried out to demonstrate compliance with standards or conditions, whilst surveillance is carried out to determine the general status of water quality. Sampling activities are also carried out to assist in investigations. Currently the NRA carries out monitoring to assess the compliance of waters with EC standards; to assess compliance of effluents with consent conditions. Surveillance work such as the quinquennial river water survey is undertaken and investigations are carried out in connection with pollution incidents.

The advent of statutory water quality objectives will cause a shift in policy to ensure that sufficient monitoring data are available to assess compliance with such objectives, whilst the general interest in environmental matters may indicate the need for more surveillance work: the general tightening of consent conditions, and new EC Directives particularly, those on Urban Waste Water Treatment, Nitrates and Ecological quality will also cause changes to monitoring programmes. The NRA's monitoring policy will become an essential strategic objective. The NRA will:

- develop the present policy on monitoring and analysis for surface waters, groundwaters, estuaries and coastal waters to ensure that requirements for Statutory Water Quality Objectives are being met;
- introduce biological techniques for assessing the overall quality of waters and to assist in pollution investigations;

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- develop and implement a compliance monitoring policy for discharges;
 - investigate and, where suitable, introduce alternatives to conventional spot sampling techniques - such as continuous on-line monitoring, or self-monitoring by the dischargers;
 - review the monitoring programmes in each Region to ensure a cost effective and consistent level of service for all controlled waters;
 - ensure that newly developing approaches to the control and reporting for EC Directives and other international governmental agreement commitments are met;
 - extend analytical capability by the introduction of automatic monitoring devices including the use of hand held devices to allow readily available and accurate data for pollution incidents and inspection work;
 - develop suitable instruments for data logging and data transmission to allow faster access to stored data, and pursue their commercial manufacture;
 - investigate the use of novel techniques, such as aerial and satellite observation to see how these can be used to identify, for example, eutrophic areas, track pollution incidents and to provide land use information for water quality management;
 - develop the use of sea-going boats to give rapid assessment of offshore pollution incidents, to provide long term monitoring capability to meet the commitments to PARCOM (Paris Commission) and NSTF (North Sea Task Force); and for monitoring compliance with Statutory Water Quality Objectives;
 - improve the use of data by developing the national water monitoring and archive system (WAMS) and the use of geographical information systems;
 - ensure that the systems available through WAMS are user-friendly, including the availability of information to the public through the Water Resources Act register; and
 - publish reports on all aspects of water quality on a regular basis.

5.12 Development of Support Services

The possibility of carrying out quality controlled analytical measurements in the field offers the potential to improve the effectiveness of the laboratory network by allowing the laboratories to concentrate on the more complex and difficult analyses such as trace pesticides and metals. Further development of the network will relate to improvements in efficiency. Besides laboratories, other specialised services will be required for the future. The NRA will:

- examine the potential to transfer measurements of routine determinands to field instruments so freeing laboratory capacity for more complex work;
- develop the laboratory network to provide a basic routine capability for chemical, biological and microbiological analysis in all Regions, but with some developing areas of special expertise;
- seek NAMAS accreditation of the laboratories to ensure that data provided meets internal, European and international obligations;
- examine the possibility of extending accreditation to sampling;
- ensure that procedures are accepted by other regulating bodies (eg, HMIP); and
- develop a network of specialised support services and skills in techniques such as toxicity assessment, complex consenting and modelling, virology, fish pathology, marine biology etc, to meet the needs of the organisation.

5.13 External Liaison

Many other organisations can influence the NRA's activities by their actions. It is important that the NRA maintains liaison with these to enable policy decisions to be taken in the context of other's activities, and where appropriate, to influence their policies. The NRA will maintain and improve links to plan future policy strategy with the following:

- Department of the Environment - As the parent ministry, the Secretary of State (and the Secretary of State for Wales) have ultimate responsibility for national policy on water quality and for setting policies.
- Ministry of Agriculture, Fisheries and Food - A statutory consultee over consents for coastal discharges and for Water Quality Objectives. It also has an important role in relation to other NRA interests (eg, fisheries, agricultural pollution, marine sludge disposal and marine dredging, etc).

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- Her Majesty's Inspectorate of Pollution - A statutory body for the implementation of Integrated Pollution Control (IPC). Formal liaison is set out in the Memorandum of Understanding.
 - English Nature and Countryside Council for Wales - Statutory consultees and involved in the long term planning for Water Quality Objectives and in the protection of designated conservation sites. The voluntary sector RSPB, RSNC and local conservation groups are also very influential.
 - Office of Water Services. Water Services Association - Bodies regulating and representing agencies which supply drinking water and treat and dispose of sewage. Water Quality Objectives will greatly affect their methods of operation.
 - European Commission - EC Directives influence the day to day operation of the NRA.
 - Regional Advisory Committees of the NRA - These committees act as sounding boards for the NRA's policies with the general public, including the setting of SWQO's.
 - Pressure Groups - Many groups (eg, Friends of the Earth, Greenpeace, Surfers against Sewage, Tidy Britain Group, Marine Conservation Society) influence public opinion on environmental matters and help produce the climate in which the NRA operates. However, their objectives are not necessarily those of the NRA.
 - Industrial and Trade Associations - Articulate and influential groups such as the CBI and NFU represent industry and water users and can act as a valuable communication route for the dissemination of NRA policies to their members and influence and improve working practices to alleviate pollution risks.
 - Angling organisations and water recreation groups - Both act as vital watchdogs and their collaboration and support is essential.
 - Local Authorities - Liaison with local authorities on planning developments, waste disposal etc is critical to the NRA's proactive role in pollution prevention.
 - The Press - The Press can readily influence public opinion and they can ensure that the NRA's point of view and policies are placed before the general public in an acceptable manner.
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- The Public - There is now very great interest in the environment, and use of water space. People are often the NRA's eyes, reporting pollution to local offices of the NRA.

5.14 Emergencies

Initial arrangements for handling emergencies have been produced, but further work is required to produce a more advanced system across all Functions and all Regions.

5.15 Finance

To undertake this work costs money, and water quality activities in the NRA are currently financed through Grant-In-Aid from the Government. Cost recovery from discharges and polluting events will allow the NRA to be less reliant on the Government. But Grant-in-Aid will always be an important source of finance under the present system governing NRA's water quality Function. It will be necessary to identify the costs attributable to all parts of the activities in water quality. Income from sources associated with these activities can then be set against the costs.

The NRA will operate the following strategy.

- The charging for discharge scheme will be introduced in full;
- The existing scheme will be reviewed and if necessary a new scheme will be developed;
- A recovery system will be introduced for the transfer of monies between NRA and HMIP for work associated with IPC;
- A costing scheme which will allow the identification of all separate activities associated with pollution control and water quality matters, together with their actual costs will be developed;
- The potential for recharging Her Majesty's Government for activities associated with international obligations will be investigated;
- Cost recovery procedures for work undertaken to alleviate, mitigate or otherwise deal with pollution will be maximised, to ensure that polluters bear the costs of their pollution; and

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- A policy for undertaking analytical or other appropriate advisory work on behalf of the other regulators will be developed.

5.16 Work Programme

The appendix shows the sequence, timing and length of individual tasks necessary to achieve the five key elements of the future strategy, as set out in 5.9 to 5.14 inclusive, above.

5.17 Output and Performance Measures

In order to assess progress towards the achievement of the aims it will be necessary to adopt measures of performance and milestones on the way. This information is essential towards justifying further funding from the Government through Grant-in-Aid and is also needed to ensure that other forms of cost recovery are adequate and justifiable. The need to address the question of the provision of resources in terms of manpower and equipment requires information on the levels of service achieved and desired, and the relative efficiency in the use of these services needs to be assessed in order to justify increases (or alterations) in resources. Output and Performance Measures are being developed.

6 RESOURCES REQUIRED

6.1 Income

After a five-fold increase in income in 1991/92, as a result of introducing a cost recovery charging scheme for discharges, income will level off with further but smaller increases in income predicted for future years. The charging scheme will be reviewed in 1994.

Activities £M	Actual 89/90	Actual 90/91	Forecast 91/92	Planned 93/94	Planned 99/2000
Income Total	1.1	21.14	38.3	46.9	60.0

6.2 Expenditure

Expenditure will continue to increase especially in relation to pollution prevention work, and dealing with pollution incidents, as the statutory duty to achieve water quality objectives assumes greater prominence as part of the NRA'S work. Increases in EC Directive work will also be reflected in higher expenditure. Savings may affect part of this increase through a greater use of automated equipment and as other methods of water quality measurement are introduced.

Expenditure on activities £M	Actual 89/90	Actual 90/91	Forecast 91/92	Planned 93/94	Planned 99/2000
Incidents/ Emergencies	6.4	8.5	9.3	10.9	16.0
Consenting Compliance Monitoring	23.2	26.6	31.4	41.7	80.0
Pollution Prevention	4.9	7.9	9.1	11.5	13.5
EC Directives	6.6	9.3	11.0	10.4	12.0
Other work	7.7	5.3	6.3	5.6	6.0
Total	48.8	57.6	66.1	80.1	127.5

6.3 Staffing

Following the increase from 1989/90 to 92/93 staff numbers will stabilise, and by 2000, approximately 1650 staff will be needed - the net increase primarily accounted for by the needs of the introduction of statutory water quality objectives. A reduction in laboratory staff reflecting increased efficiency will be balanced by an increase in field staff due to increased emphasis on pollution prevention activities.

Manpower (FTE)	Actual 89/90	Actual 90/91	Forecast 91/92	Planned 93/94	Planned 99/2000
Total	1034	1330	1569	1619	1650
Laboratories	266	342	494	482	450
Pollution Inspectors	384	473	535	546	600

6.4 Assets

The assets of the Water Quality Function consist of laboratories, survey vessels and automated instrumentation networks.

Eleven major laboratories are now in operation. These are primarily Chemistry laboratories which are located in strategic sites, which carry out high-throughput chemical analyses. There are also eighteen small, mainly biological, laboratories which process locally samples which cannot easily be transported to central laboratories. Computer-based laboratory information and management systems are in widespread use.

There are a large number of automatic continuous water quality monitoring stations currently in use throughout the NRA and an evaluation of newly developed hand held automatic monitors is under way. The Severn Trent region provides laboratory based facilities for this programme.

In order to accommodate the need to sample offshore waters, two new marine vessels have been commissioned to cover the eastern and north-eastern coasts augmenting the highly successful NRA vessel *Vigilance* now operating from the Wessex Region.

6.5 R&D Requirements

The NRA's needs for new knowledge to support its strategy concerning Water Quality are met by its R&D programme.

WATER QUALITY 2000

APPENDIX

WORK PROGRAMME - WATER QUALITY

Strategic Activity

90 91 92 93 94 95 96 97 98 99 2000

WATER QUALITY OBJECTIVES

Finalise proposed SWQO Scheme

Consult with Public

Implement scheme for rivers

Implement scheme for lakes, ponds etc

Implement scheme for estuaries

Implement scheme for coastal waters

Develop environmental quality standards

Develop and implement catchment planning

Develop catchment accountability

Investigate economic band for quality

Review quality objectives

Implement new EC Directives - Nitrate

Urban Waste Water Treatment

Ecology

Dangerous Substances



Develop Policy

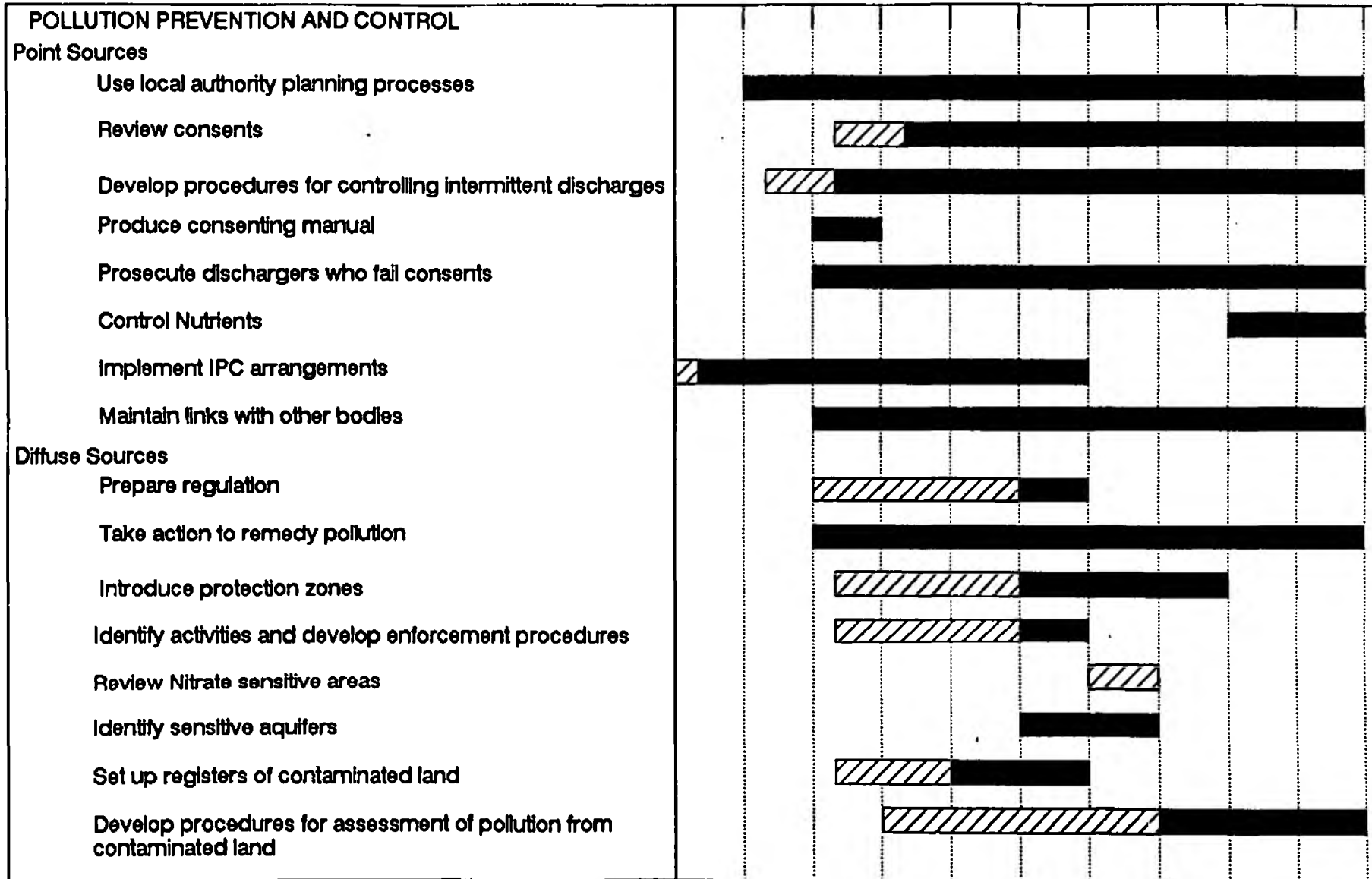


Implement Policy

WORK PROGRAMME - WATER QUALITY

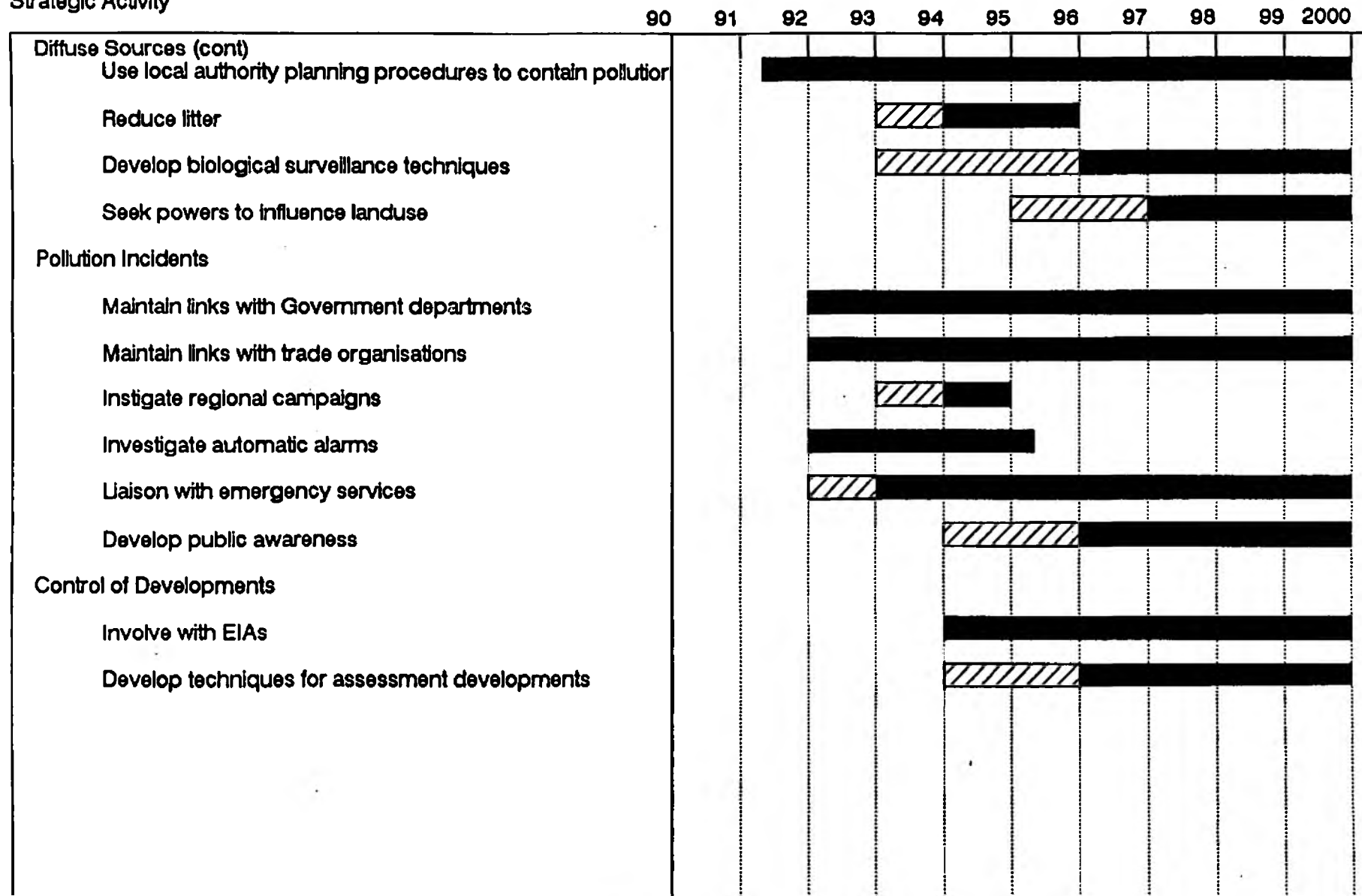
Strategic Activity

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WORK PROGRAMME - WATER QUALITY

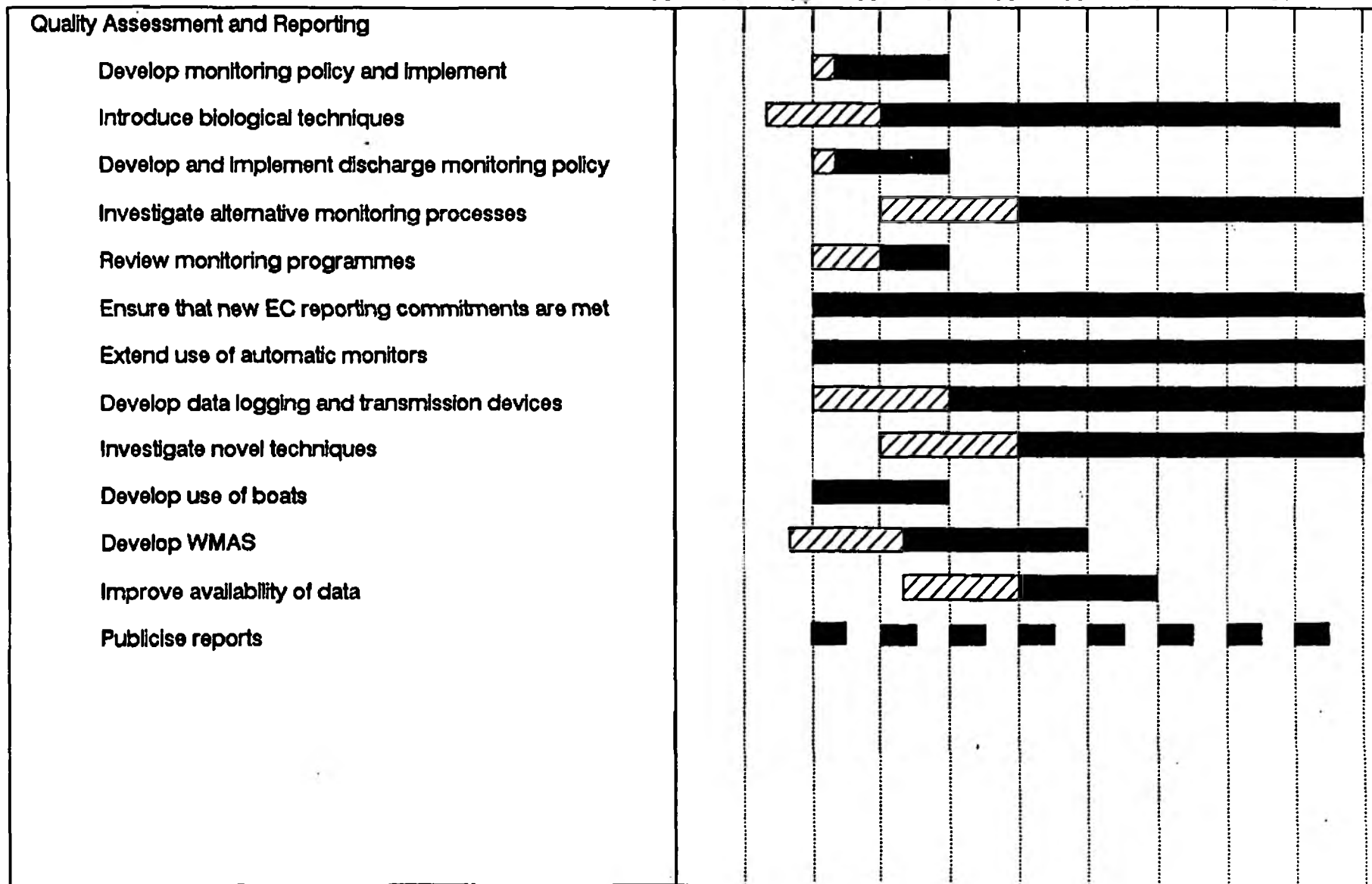
Strategic Activity



WORK PROGRAMME - WATER QUALITY

Strategic Activity

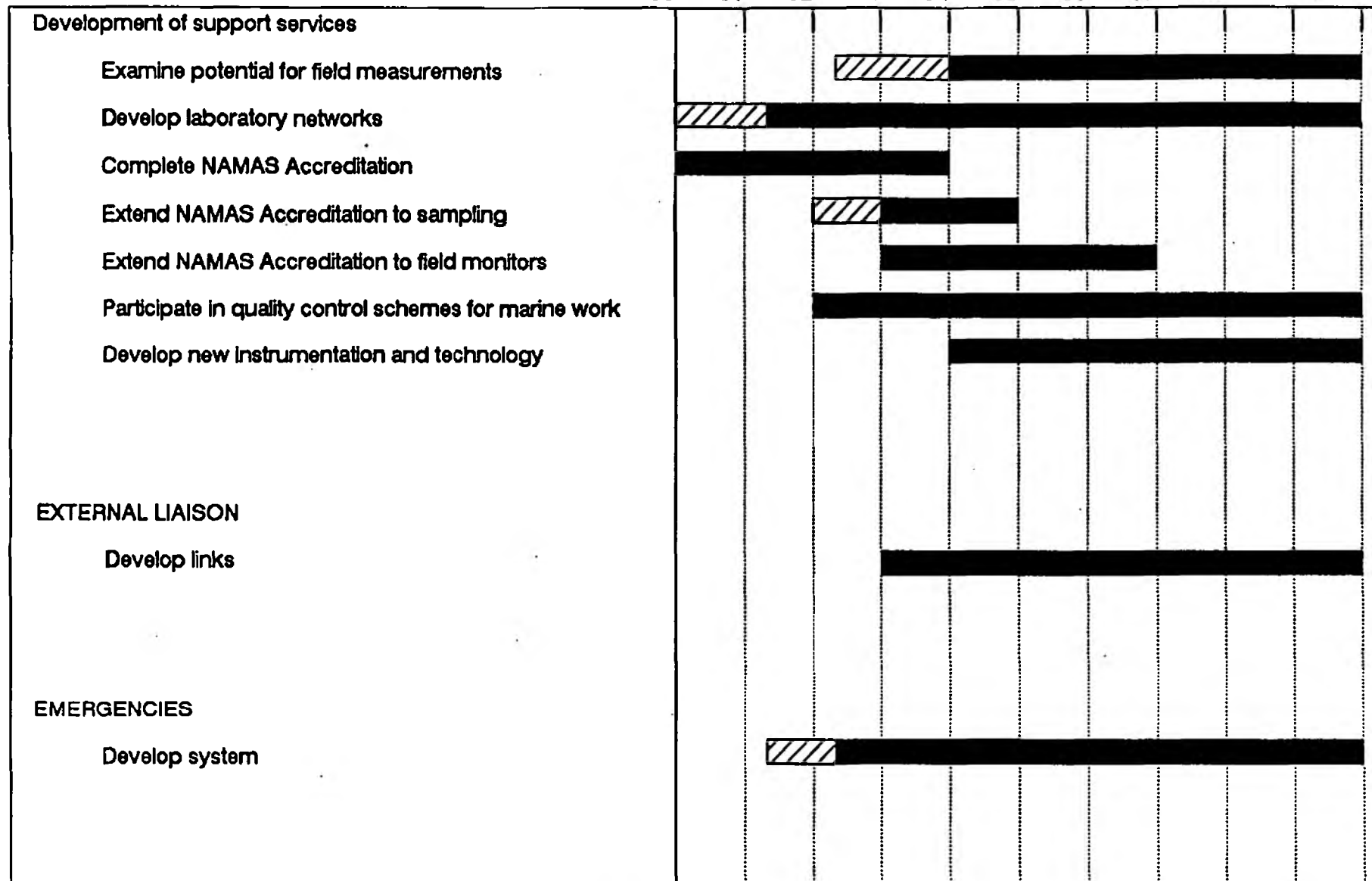
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WORK PROGRAMME - WATER QUALITY

Strategic Activity

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WORK PROGRAMME - WATER QUALITY

Strategic Activity

90 91 92 93 94 95 96 97 98 99 2000

FINANCE

Introduce full charging scheme

Review scheme

Introduce cost recovery for IPC

Develop costing system

Identify costs of Government work

Recover costs from polluters

Develop policy for external work

