

NRA Wales 88

National Rivers Authority

Awdurdod Afonydd Cenedlaethol

WELSH REGION

Rhanbarth Cymru

WATER RESOURCES

Functional Strategy 1990-1995



NRA

Guardians of the Water Environment

Diogelwyr Amgylchedd Dwr

NRA Wales 88

National Rivers Authority
Information Centre
Head Office

Class No

Accession No *ANXA*

ENVIRONMENT AGENCY



092025

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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, ground waters, estuaries and coastal waters. The Authority will be businesslike, efficient and caring towards its employees.

FOREWORD

The management of water resources is one of the most important functions of the National Rivers Authority, safeguarding as it does, essential water supplies for industry, agriculture, and the domestic consumer.

With the highest average rainfall of any of the Regions and a topography which has been exploited for the storage of vast volumes of water, the Welsh Region supplies not only the needs of its resident population, but also those of large conurbations in the North West and Midlands.

As management of these major and more local supplies is becoming ever more complex with the increasing demand for a high quality environment, the NRA as Guardians of the Water Environment, will take a fresh look at the way in which resources have been allocated, to ensure that the environmental needs of the rivers are properly protected.

This Strategy is the first step in setting out our water resources plans for the next 5 - 10 years and provided we are adequately resourced in terms of manpower and finance I am confident we can meet the demanding objectives which have been set.

Dr. John Stoner

Regional General Manager

1. EXECUTIVE SUMMARY

1.1 Introduction

The implementation of the Water Act 1989 has provided the NRA with an opportunity to review the management of water resources and to balance the demands of legitimate abstractors with the environmental needs of surface and underground waters. This strategy is the first step in planning resources from this new perspective of environmental protection and sets out the broad plan for the next 5 - 10 years.

1.2 The Welsh Region is one of the largest of the ten NRA Regions and its water resources are used not only to meet the needs of its resident population of over three million people, but also those of large conurbations in the English Midlands and the North West. There are five major private water undertakers within the Region and over 4,000 licenced abstractors who use water for industry, agriculture and domestic supplies.

1.3 The management of this resource is largely concerned with assessing the quantities of water available by field measurement and managing those resources to meet demand. A total of 164 river gauges, recording over 6 million bits of data each year, form the foundation of the hydrometric network. The total network of hydrometric assets has a value of over f8M and requires careful maintenance by dedicated staff to record river flows with the required precision.

1.4 Planning

The Water Resources Function has a clear aim and this is

"To assess, manage, plan and conserve water resources and to maintain and improve the quality of water for all those who use it."

A number of demanding objectives have been set to achieve this aim over the period of this Strategy and these will be addressed progressively through setting targets for action each year in the Regional Plan.

1.5 Key Issues

Of all the issues which are of concern, perhaps the most important is the implementation of a consistent licencing policy across the Region and the development of a national Scheme of Abstraction Charges. The enforcement and policing of licences will also be of prime concern.

In the longer term, the Region must assess the availability of supplies and ensure that plans are in place for the strategic development of water resources to meet the future demands of domestic, agricultural and industrial abstractors.

The protection and improvement of the quality of surface and groundwater resources for existing and potential abstractors is another major issue. In the Welsh Region, groundwater supplies an equivalent population of around 1 million people, and must be properly protected by an Aquifer Protection Policy which will be developed nationally and implemented across the Region.

1.6 Resources

A total of 34.2 Full Time Equivalents (FTE's) staff are presently employed within the Water Resources Function and this will need to be increased to 41.2 FTE's to implement the Strategy. The additional staff which will be required are:

- (i) 3 No. Water Resources Planners for water resources input to catchment management plans.
- (ii) 1 No. Hydrogeologist
- (iii) 3 No. Licence Enforcement Officers

The total funding for the function is estimated at £6.8m at April 1989 prices, with an additional £1m required in 1993/94 for major capital works. This expenditure will be funded by the Water Resources Account through charges raised from licenced abstractors.

2. INTRODUCTION

2.1 This is the first Water Resources Functional Strategy for the Welsh Region of the NRA and it sets out the main aims and objectives which need to be addressed over the next 5 - 10 years. The Strategy will be used to signpost the way forward, so that each year, targets for action can be set out in the Regional Plan, which will steadily move the Function in the required direction.

The Strategy also forms part of a wider plan for England and Wales which will integrate all Regional Strategies into a national approach for the Function.

2.2 The priorities for action will depend on a mix of various pressures and the overall position inherited at 1st September 1989 when the NRA came into existence. It is already clear however, that the demand for environmental protection has never been more insistent. As a consequence the management of water resources is now very high in the public perception.

If the NRA is to be effective, it is essential that the organisation works with a common purpose. The Strategy therefore sets out the key programmes and plans which will need to be developed over the next few years and identifies the financial and manpower resources which will be required.

2.3 It is important to recognise that the management of water resources is largely based on assessing the quantities of water available by field measurement and by issuing and enforcing abstraction licences. Attention to these fundamental activities should not be diminished in the search for excellence in policy and administration.

Not all
Regions
can do this
2.2
National
document

3. THE WATER RESOURCES FUNCTION IN THE WELSH REGION

3.1 National Aim

The aim of the Water Resources Function is:

To assess, manage, plan and conserve water resources and to maintain and improve the quality of water for all those who use it.

3.2 Statutory Obligations

The Water Act 1989 places duties and obligations on the Authority for conserving, re-distributing or otherwise augmenting water resources and for securing the proper use of water resources. These duties include entering into and maintaining water resources management schemes agreed with water undertakers, the establishment of minimum acceptable river flows, the provision of hydrometric data and for taking appropriate action during droughts. The NRA also has responsibilities for organising the abstraction licencing provisions of the Water Resources Act 1963 as amended by the Water Act 1989 and other legislation.

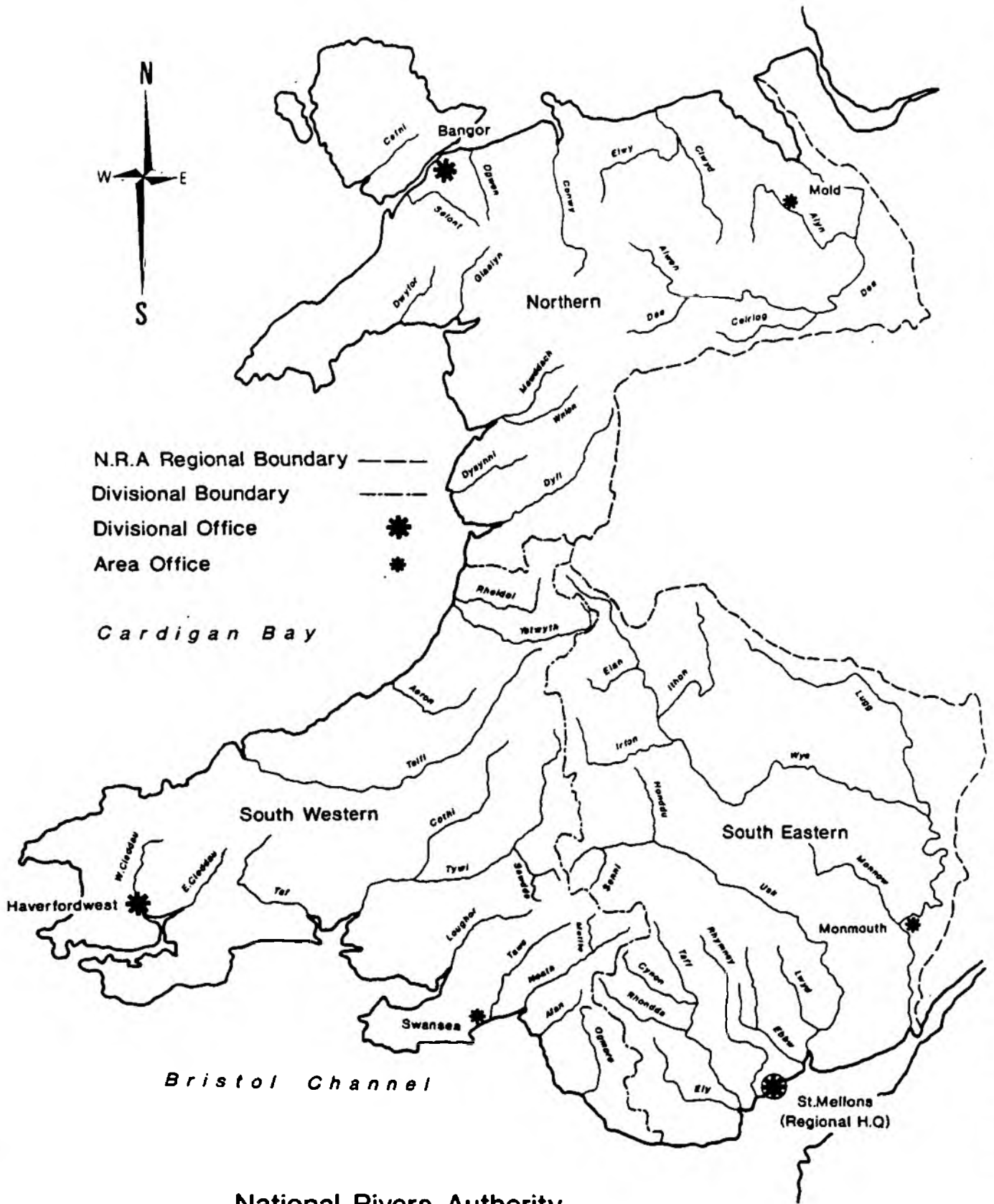
of WWT → The management of water resources is largely concerned with assessing the quantities of water available by field measurement and managing those resources to meet all demands for water. The suitability of water resources for public water supply and other uses is dependant upon its quality. Provision is therefore included in the Water Resources Account for monitoring water quality for the protection of supplies. In addition there are statutory obligations in the Water Act 1989 in respect of avoiding pollution of groundwaters, by the establishment of water protection zones and nitrate sensitive areas.

3.3 General Introduction

Population → The Welsh Region is one of the largest of the ten NRA regions, covering an area of some 21,000 Km². The area served, as shown in the following figure, includes the whole of Wales (except the Upper Severn catchment) and the full catchment areas of the Dee in Cheshire and the Wye in the Forest of Dean and Hereford areas. With annual rainfall as high as 2000mm over much of mid and South Wales, and up to 4000mm in Snowdonia, water resources figure largely in the Region's activities. In addition to supplying the needs of the resident population of over three million people, rivers and reservoirs within the Region are used to supply large conurbations in the Midlands and the North West. The major water undertakers within the region are

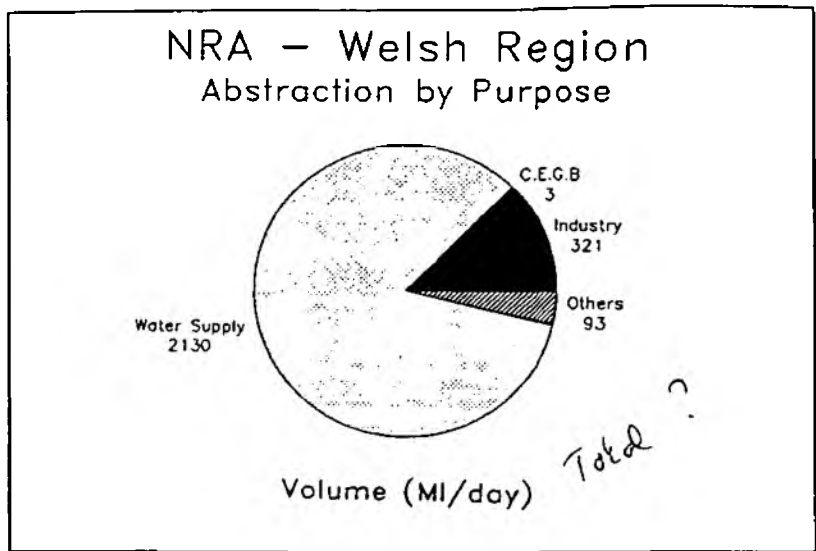
Welsh Water Plc
Severn Trent Water Plc
and North West Water Plc

Major Abstractors → Other private undertakers include the Wrexham and East Denbighshire Water Co. and Chester Water Works Co. The CEGB are also major abstractors within the region along with significant abstractors for industry such as British Steel. The proportion of water abstracted for each main purpose is shown in the following diagram.



National Rivers Authority
 - WELSH REGION -

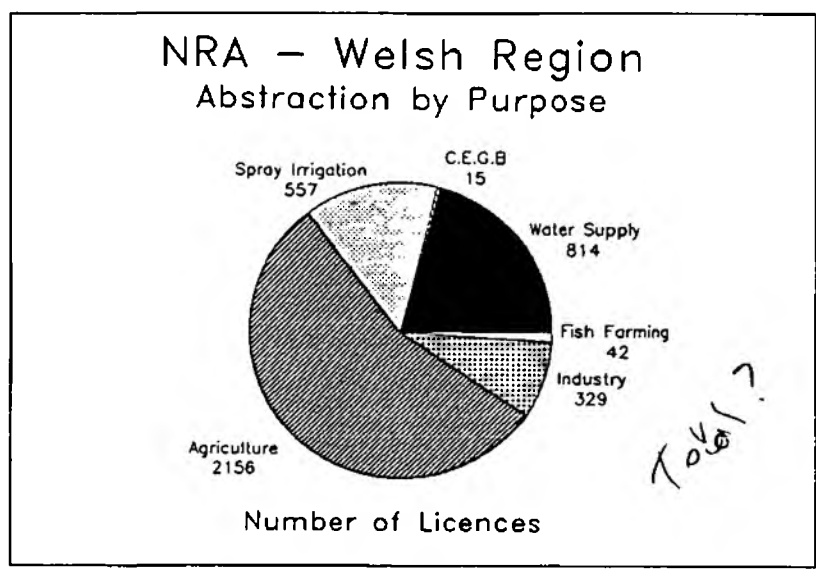
Demand



The development and operation of this resource is complex and requires careful management by the NRA Welsh Region using a network of gauges measuring rainfall and the run off from catchments. (see Appendix 1)

Most of the larger rivers are regulated by releases of water from the reservoirs in the upland gathering grounds such as Llyn Celyn and Llyn Brenig on the River Dee, the Elan Valley reservoirs on the Wye and Llyn Brianne on the Tywi. Releases are made under close NRA supervision to meet the downstream requirements of water companies and industry. Releases are also made to maintain a healthy flow for fisheries and for the general benefit of the river.

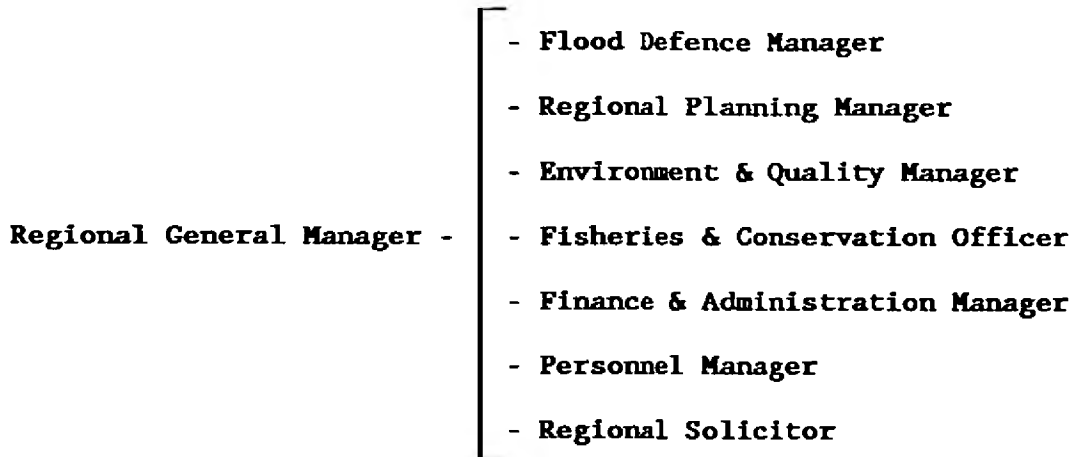
The NRA manages the abstraction of water through the system of abstraction licencing which protects streams and rivers from over abstraction. In some parts of the Region such as Herefordshire and Pembrokeshire, the average rainfall decreases to only 650 to 1000 mm per annum. As these are also areas of intensive cultivation, they experience a great pressure on water resources for irrigation. The number of licences for each main purpose is shown in the diagram below.



Abstraction of groundwater is of local importance for rural water supplies, agriculture and industry, and amounts to 140 Ml/day, or an equivalent population of one million people. It is a measure of the total level of resource development that groundwater abstraction is less than 10% of total abstraction within the Region. The main aquifers within the region are sandstones in the Vale of Clwyd, and carboniferous limestone which outcrops in South Wales. Superficial deposits of glacial material also support important abstractions particularly in the catchment area of the River Wye.

3.4 Organisation

The Water Resource Function is represented at Regional Management Group by the Flood Defence and Regional Planning Managers in the management structure shown below:-



The Flood Defence Manager has responsibility for the function's staff in the three Divisions, and the Regional Planning Manager is responsible for the function at Regional Head Office through the Strategic Planning Manager.

There are a total of 33 FTE Divisional staff and 1.2 FTE at Regional Head Office, comprising the Strategic Planning Manager (0.2 Water Resources FTE) and the Water Resources Co-ordinator. The Strategic Planning Manager has a functional link direct to the three Divisional Hydrologists who head up each Division.

4. **PLANNING AND PRIORITIES**

4.1 The National Aims and Objectives of the Water Resources Function have been determined as follows:-

4.2 **National Aims**

To assess, manage, plan and conserve water resources and to maintain and improve the quality of water for all those who use it.

4.3 **National Objectives**

To determine applications for abstraction licences according to statutory requirements and develop new charging policies for water abstraction.

To formulate an aquifer protection policy.

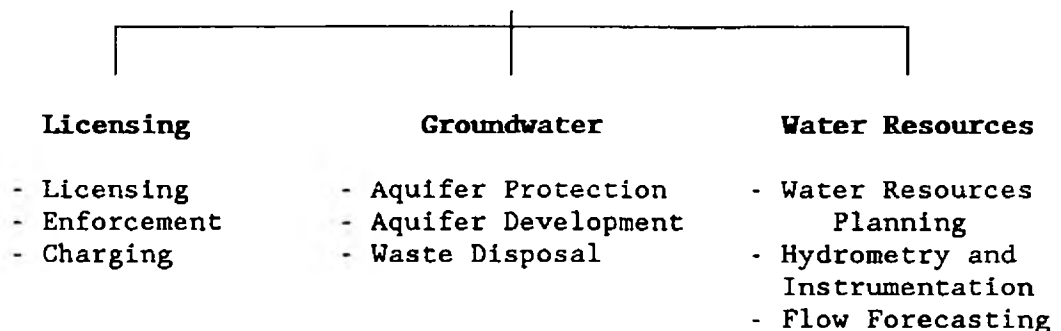
To maintain adequate hydrometric data collection arrangements.

4.4 **Regional Objectives**

- 1) To secure an effective workforce through career planning, training and recruitment.
- 2) To implement a consistent licencing policy across the Region and to establish formal Minimum Acceptable Flows wherever appropriate.
- 3) To implement an enforcement and prosecution policy for water abstraction licencing.
- 4) To protect and improve the quality of surface and groundwater resources for existing and potential abstractors.
- 5) To ensure the provision of strategic water resources within the Region.
- 6) To manage groundwater and surface resources effectively.
- 7) To maintain and develop an efficient and effective hydrometric scheme.

4.5 The Aims and Objectives will be achieved through a series of initiatives which have been identified under three distinct areas of work:-

Water Resources



4.6 Further details of the broad activities for each of these support areas is shown in the following table.

WATER RESOURCES

LICENCING - Licencing - Enforcement - Charging	GROUNDWATER - Aquifer Protection - Aquifer Development - Waste Disposal	WATER RESOURCES - Water Resources Planning - Hydrometry & Instrumentation - Flow Forecasting
1. Licence Administration 2. Licencing Policy 3. Implementation of policy 4. Charging scheme 5. Setting charges for licences 6. Production of annual charges 7. Production of S63 Agreements 8. Licence Enforcement - Policing - Offence reports - Prosecution 9. Promotion of Orders 10. Statutory Returns 11. High Level Liaison with major abstractors 12. Town & Country Planning Consultations 13. Setting Control Points, MAF's, compensation flows 14. Revocation of Licences	1. Aquifer Protection Policy (APP) 2. Implementation of APP 3. Waste disposal 4. Pump tests 5. Aquifer development 6. Interaction of groundwater and surface sources 7. Drilling consents 8. Assessment of impact of development 9. Groundwater Chemistry 10. Liaison with consultants	1. Assess availability of surface and groundwater resources 2. Maintain demand forecasts for PWS, industry and agriculture 3. Ensure the provision of strategic resources according to demand, having regard to W S plc's proposals 4. Maintain and develop river flow and forecasting systems 5. Maintain and develop Operating Agreements under the Water Act 1989 6. Maintain and develop schemes for the management of water resources 7. Develop models for key regional supply schemes and assess the impact of new droughts 8. Maintain and develop hydrometric schemes including weather radar 9. Advise on discharge consents and develop models for ungauged sites 10. Provide Water Situation Reports
Enquiries: MD, Government, MD, Private, Industry; Maintain information systems and archives; Research and Development; Training		

4.7 The planning approach will be to develop each of these activities on a modular basis as targets within the Regional Plan. It will be necessary to maintain a close liaison with other Regions and on major initiatives such as the Information Systems Strategy, to ensure that resources are not wasted by duplication of effort.

4.8 It is important to recognise the various pressures which will be exerted on the Function which will influence the priorities for action:

- Legislative
- Pressure Groups
- Public Expectation
- Political
- NRA National Priorities
- NRA Regional Priorities

Initially however, it will be important to set national policy and plans for the key areas of the function, particularly:-

- Licence Policy
- Aquifer Protection
- Enforcement and Prosecution
- Research & Development

4.9 In order to progress certain projects in line with public expectation, it may be possible to establish policy by 'action learning' on pilot or pathfinder projects within the Region. An example would be the setting of a Minimum Acceptable Flow for the River Wye, which is an important salmonid river with high amenity, supporting major abstractions for public supplies and spray irrigation.

5. PROGRAMMES AND PLANS

5.1 Programmes and Plans

The programmes and plans for the next 5-10 years have been divided into three main sub functions for management purposes.

These are, Licences - Groundwater - and Water Resources

The sub functions are further divided into 'support areas', each of which has a numbered objective and priority rating, 1 or 2. The programming of the various activities over the next five years or so, together with the estimated manpower requirements, is shown in a following chart.

Handwritten notes:

- Info
- Background
- Resource supply
- Demand
- Issues
- Policy
- Strategy
- Programmes / Plan
- Manpower
- Finance

Handwritten notes:

Wrong way
around?

Support Area	Objective Priority	Priority
Licence Administration	i. To develop common administrative procedures and licence conditions across the Region.	1
	ii. To optimise the use of the the CEO (Comprehensive Electronic Office) system for licence administration	1
Licence Policy	i. To develop and implement a technical framework for determining abstraction licence applications for surface waters.	1
	ii. As above for groundwater.	1
Minimum Acceptable Flows	i. To prioritise the catchments which require the setting of MAF's.	1
	ii. To establish formal MAF's in accordance with agreed programme.	2
Over abstracted rivers	i. To identify over abstracted rivers and propose remedial works and solutions.	1
	ii. To implement remedial works and solutions in accordance with agreed programme.	2
Enforcement	i. To implement the licence enforcement policy for : - policing abstractors - preparation of offence reports - prosecution	1
Scheme of Abstraction	i. To contribute to the development of a national Scheme of Abstraction Charges and implement the Scheme within the Region.	2
Information Systems	i. To implement a computer based system for the management of licence and charging data.	1
Training	i. To ensure the provision of relevant staff training for licencing and enforcement.	1

WATER RESOURCES PROGRAMME

Sub Function : LICENCING

Support Area	Objectives	Financial Year				Number of Man Years				
		1990	+	1991	+		1992	+	1993	+
Licence Administration	(i)									0.2
	(ii)									0.2
Licence Policy <i>Renewal ?</i>	(i)									0.2
	(ii)									0.2
Minimum Acceptable Flows (M.A.F)	(i)									0.1
	(ii)									4 +
Over Abstracted Rivers	(i)									0.1
	(ii)									4 +
Enforcement	(i)									20.0
Scheme of Abstraction Charges	(i)									0.5
Information Systems	(i)									0.5
Training	(i)									0.5

Support Area	Objective Priority	Priority
Aquifer Protection Policy (APP)	i. To assist in the development of an aquifer protection policy.	1
	ii. To implement the APP within the Region.	2
Groundwater Quality	i. To design and implement a network of observation boreholes for monitoring the quality of groundwater.	1
Aquifer Development	i. To prepare and implement a programme to identify the existing development of aquifers within the Region and to determine the potential for further development.	2
Impact Assessments	i. To assess the impact of the Second Severn Crossing on the Severn Tunnel Great Spring.	1
	ii. To assess the impact of the Cardiff Bay Barrage on groundwater levels and advice on remedial action.	2
Information Systems	i. To develop an archive of information relating to groundwater resources and quality.	2
Training	i. To ensure training of water resources staff in basic groundwater investigation methodologies.	1

WATER RESOURCES PROGRAMME

Sub Function : GROUNDWATER

Support Area	Objectives	Financial Year					Number of Man Years				
		1990	+	1991	+	1992		+	1993	+	1994
Aquifer Protection Policy (A.P.P)	(i)										0.2
	(ii)										0.2
Groundwater Quality Objectives	(i)										0.2
Aquifer Development	(i)										0.8
Impact Assessments	(i)										0.2
	(ii)										0.4
Information Systems	(i)										0.1
Training	(i)										0.5

Support Area	Objective Priority	Priority
Assess availability of Water Resources	Assess availability of water resources for :	
	i. Surface waters	1
	ii. Groundwaters	1
Demand Forecasts	Prepare Demand Forecasts for :	
	i. Public water supply	1
	ii. Industry	1
	iii. Agriculture	1
Strategic Resources	i. Identify the requirements for strategic resources having regard to the W.S plc proposals.	2
Water Resources Modelling	i. To develop models for key regional supply schemes and to assess the performance of the scheme following new developments or new drought events.	2
Forecasting Systems	i. To develop models for forecasting.	2
	ii. River regulation requirements	
	iii. Flood Warning	
Ungauged Sites	i. To develop models for estimating river flow statistics at ungauged sites.	1
Water Situation Reports	i. To develop an improved system of reporting on the water situation within the Region.	1
Operating Agreements and Water Resources Management	i. To prepare, maintain and develop schemes for the management of water resources within the Region.	1

5.4 Water Resources (continued)

Support Area	Objective Priority	Priority
Hydrometric Scheme	i. To maintain and improve the hydrometric scheme within the Region and to implement the Regional telemetry scheme.	1
Training	i. To identify training requirements for water resources and hydrometric staff and to implement an appropriate programme.	1

WATER RESOURCES PROGRAMME

Sub Function : **WATER RESOURCES**

Support Area	Objectives	Financial Year					Number of Man Years				
		1990	+	1991	+	1992		+	1993	+	1994
Assess availability of Water Resources	(i)										2.0
	(ii)										2.0
Demand Forecasts	(i)										0.2
	(ii)										0.2
	(iii)										0.2
Strategic Resources	(i)										1.0
Water Resources Modelling	(i)										0.5
Forecasting Systems	(i)										1.0
Ungauged Sites	(i)										0.5
Water Situation Reports	(i)										0.2
Operating Agreements and Water Resources Management	(i)										1.0
Hydrometric Scheme	(i)										1.0
Training	(i)										0.5

6. MANPOWER OUTLOOK

6.1 Recruitment and Organisation

The Water Resources Function in the Welsh Region has not recruited professionally qualified staff for a period well in excess of 10 years. This has caused two major problems :

- (i) A shortage of staff to implement the Strategy
- (ii) There is no succession for middle and senior management positions.

It is therefore essential that a total of 7 additional staff are recruited as outlined in the table below.

In addition, alternative methods of organisation should be considered as opportunities occur, as a means of improving the career structure, accountability and productivity.

6.2 Manpower Planning

The numbers and grades of staff to be employed by the Water Resources Function is shown in the following table below.

Water Resources Function
Number of Personnel at 1 April (FTE)

Grade	Actual 1989/90	Planned				
		90/91	91/92	92/93	93/94	94/95
12						
11	0.2	0.2	0.2	0.2	0.2	0.2
10		1	1	1	1	1
9	3	3	3	3	3	3
8	1	1	1	1	1	1
7						
6	6	9	9	9	9	9
5						
4	6	6	9	9	9	9
3	14	14	14	14	14	14
2	4	4	4	4	4	4
1						
Total	34.2	38.2	41.2	41.2	41.2	41.2

The additional staff required in 1990/91 are required for undertaking water resources analysis for catchment management plans and a hydrogeologist to coordinate Regional groundwater investigations. At the present time there are no suitably qualified staff within the Region to undertake this work.

It is expected that the licence enforcement policy will require a significant increase in this area of activity (none is carried out at present) and will require a minimum of 3 enforcement staff for catchment surveillance with effect from 1991/92.

7. FINANCIAL OUTLOOK

7.1 Main Issues

The Water Resources Function is funded by the Scheme of Abstraction Charges which raises income from licenced abstractors. The costs which may be charged to the Water Resources Account are:

- Water Resources operating costs
- Water Quality costs for resource protection
- Capital Expenditure for remedial water resources work (provisional)
- Costs associated with the determination of water abstraction licences.

7.2 Expenditure

The medium term expenditure against the Water Resources Account which will be required to implement the strategy is indicated in the table below:

Water Resources Function
Planned Expenditure (£000)

Revenue Costs	90/91	91/92	92/93	93/94	94/95
Direct Operating Costs	1,072	1,122	1,122	1,122	1,122
PLC Recharge	3,938	3,938	3,938	3,938	3,938
Asset Management Planned Maintenance	200	200	200	200	200
Sub-Total	5,210	5,210	5,210	5,210	5,210
Support Costs	90/91	91/92	92/93	93/94	94/95
Water Quality Recharge	350	350	250	350	350
Research & Development	170	170	170	170	170
Other Support	673	578	560	542	542
Sub-Total	6,403	6,308	6,290	6,272	6,272
CCA Depreciation	308	316	338	346	346
Interest Receivable	(146)	(146)	(146)	(146)	(146)
Total Revenue	6,565	6,478	6,482	6,472	6,472
Capital Costs	90/91	91/92	92/93	93/94	94/95
Capital	100	200	1,100	100	100
Capital Support	143	105	105	105	105
Total	6,808	6,833	7,737	6,727	6,727

The main point to note is the capital cost for the construction of an additional draw-off at Llyn Brianne reservoir. This reservoir is used to regulate the R.Tywi under an Operating Agreement with Welsh Water plc. At present the reservoir has a single draw-off which results in extremely cold discharges and adverse environmental effects on an important salmonid fishery.

A longer term financial forecast to cover the period 95/96 - 2000, is not possible at this stage as it will depend on the outcome of various investigations programmed within this Strategy.

Appendix 1

HYDROMETRIC ASSETS

Asset Type	South East Division	South West Division	North Division	Total No.	Value £'000
Rain Gauges	104	79	99	282	166.15
River Flow Measurement Stations *1	33(17)	24(16)	36(8)	93	5936.20
Flood Warning Stations *2	31	9	4	44	828.10
River Level Only Stations	4	12	8	24	234.50
Other Stations	1	-	2	3	257.50
Reservoir/ Lake Stations	-	-	4	4	43.00
Groundwater Monitoring Sites	10	-	18	28	461.00
Tide Level Stations	-	2	4	6	37.60
Climate/ Weather Stations	-	2	3	5	38.42
Total					£ 8002.47

*1 Includes some stations (X) that are also Flood Warning Stations.

*2 Excludes stations that although serve as Flood Warning Stations, are primarily Flow Measurement Stations.

