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local

FEBRUARY 1998



Information Services Unit

Please return or renew this item by the due date

Due Date



ENVIRONMENT
AGENCY

Key Details

Area: 1,200 km²

Population: 375,500 (approximately)

Major settlements

Alfreton	8,210
Bakewell	3,920
Belper	18,510
Buxton	16,060
Derby	176,535
Matlock	5,130
Ripley	9,250
Wirksworth	5,750

Topography

Maximum Level -	636 (mAOD) Kinder Scout
Minimum Level -	29 (mAOD) Church Wilne

Water Resources

Average annual rainfall	1022mm
Total licensed abstraction	- 5,536 Ml/d
	- 1,615,739 Ml/a
Number of surface abstractions	95
Number of groundwater abstractions	229
Number of licensed impoundments	12

Conservation

Sites of Special Scientific Interest	51
Special Areas of Conservation	3
Scheduled Ancient Monument	186
Sites of Interest for Conservation	415
Special Protection Area	1

Fisheries

Length of designated rivers	
Salmonid (salmon and trout)	157.4km
Cyprinid (coarse fish)	37.9km

Flood Defence

Length of "Main" river	171.2 km
Length of floodbanks and floodwalls maintained by the Agency	20 km
Number of urban flood alleviation schemes	9

Monitored Water Quality

Length of river in Grade (Km)

Quality	Grade	Chemistry	Biology
Good	A	100.9	104.9
	B	97.8	81.0
Fair	C	50.3	67.4
	D	26.1	26.0
Poor	E	5.1	5.9
Bad	F	0.0	0.0

(Lengths measured for chemistry & biology differ slightly).

Consented major discharges:-

Sewage effluent	19
Industrial effluent	8

Waste Management

Landfill Sites	25
Transfer Stations	16
Civic Amenity Sites	1
Waste Processing Plants	7

Integrated Pollution Control (IPC)

IPC Authorised Sites	26
Radioactive substances (RAS)	
Authorisations for accumulation and disposal	5

Local Authorities in the plan area

County Councils	Unitary Authorities	District/Borough Councils	Others
Derbyshire Nottinghamshire South Yorkshire	Derby Sheffield	Amber Valley Ashfield Bolsover Erewash Derbyshire Dales High Peak North East Derbyshire South Derbyshire	Peak District National Park Authority

Your Views

The Derbyshire Derwent Local Environment Agency Plan (LEAP) Consultation Report is the Environment Agency's analysis of the local environment in this area and the issues that the Agency believes need to be addressed.

The Agency wants to hear your views as this report is part of an important consultation process.

- ☐ Have we identified the major issues?
- ☐ Have all the options and solutions to issues been identified?
- ☐ Do you agree with the vision for the area?
- ☐ Do you have any other information or ideas that need to be considered?

Please send your comments on the Derbyshire Derwent Local Environment Agency Plan Consultation Report to:-

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The Environment Agency
Scarrington Road
West Bridgford
Nottingham NG2 5FA

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Fax: 0115 9817743

E-mail: alison.hepworth@environment-agency.gov.uk

To help your response a questionnaire is provided together with a prepaid envelope. Letters, faxes, and other forms of written response are welcome. Further copies of this document can be obtained free from the above address.

All comments received will be treated as public information unless you state otherwise in your response.

Your views on this report will be considered in preparing the next phase, the Action Plan.

The consultation report will not be rewritten as part of the action plan process.

However any errors or omissions will be acknowledged in a statement on the public consultation response, to be published soon after the consultation period which ends on 30 April 1998.

The Agency intends that the Derbyshire Derwent Action Plan should also influence the policies and actions of Local Authorities, developers and others as well as assisting the Agency in the day to day management of the LEAP area.

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**Derbyshire Derwent
Local Environment
Agency Plan**

Map 1

**ENVIRONMENT
AGENCY**

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Derbyshire Derwent**KEY**

-  LEAP area
-  Watercourse
-  Canal
-  Built up area
-  Motorway
-  A road
-  Railway

N

0 10km



- Issue 19

Minimisation of Industrial Waste Generation.
- Issue 20

Minimisation of water use due to recent drought conditions.
- Issue 21

Damage to the water environment and derogation caused by the operation of hydropower sites.
- Issue 22

Contaminated land.
- Issue 23

The risk of flooding to undefended properties and properties where flood defences require enhancement.
- Issue 24

Lack of definition of floodplains.
- Issue 25

The inability to provide scientific interpretation due to the lack of air quality data.

8 In which town or area do you live?

- 9 What best describes your interest in this LEAP?
- ☐ An officer working for a local authority or government agency/ department

☐ An officer/representative of a national organisation

☐ A member of an environmental pressure group

☐ A representative of a private company

☐ A member of a local sports club

☐ A member of a local amenity society (e.g. Civic Trust)

☐ A local resident

☐ An individual interested in environmental matters.
- Other (please specify)
-

10 Are there other issues you would like to see included in the Action Plan? Y/N.

If "yes", please give brief details (use separate sheets if necessary).

11 Are there any major errors or omissions in the report? Y/N

If "yes" please give brief details (use separate sheets if necessary).

12 If you would like a reply, please write your name and address below. Your address will not be given to anyone else, although this questionnaire will be available for public inspection.

Name:_____

Address:_____

Post Code:_____

Comments

If you have any further comments, please write them here or continue on another piece of paper.

Thank you

For completing this questionnaire.


Alison Hepworth
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Scarrington Road
West Bridgford
Nottingham
NG2 5FA

Tel: (0115) 9455722
Fax: (0115) 9817743

Questionnaire - Your views count

The aims of the Derbyshire Derwent LEAP Consultation Report and summary leaflet are:

 To inform you of our vision and the issues we think need tackling, whilst providing background environmental information.

 To receive your views and comments. This is your opportunity to tell us what you think and you can help by filling in this questionnaire or by sending a separate written statement. All comments received will be treated as public information unless you state otherwise.

i) Please answer the following question (it should only take 5 minutes).

ii) Please add any further comments on the back of the sheet.

iii) Detach the questionnaire and send it to us in the FREEPOST envelope provided.

Questions

1 Have you heard of the Environment Agency before? Y/N

2 How did you find out about this Local Environment Agency Plan? (Please tick below)

- ☐ Letter from the Environment Agency
- ☐ Environment Agency displays
- ☐ Radio
- ☐ Television
- ☐ Newspaper
- Other (specify) _____

3 Where did you get this report/summary leaflet

4 Our vision for the area is:-

"A sustainable local environment that is attractive, clean and diverse, balancing the needs and aspirations of people whilst maintaining and enhancing the diversity of flora and fauna. An environment that contributes to the economic and social well being of the area".

Do you agree with this? Y/N

If you disagree, please state why.

6 The principal aim of the Environment Agency is to "contribute to sustainable development".

Do you understand what is meant by the term "sustainable Development"? Y/N

7 We have identified issues and options in Section 3 of the Consultation Report and in the summary leaflet. Please circle and mark the five issues of most importance to you, ranking them in order. (1=Most important, 5=Least important)

- | | |
|----------|---------------------------------------------------------------------------------------------------|
| Issue 1 | The deterioration of Calver Weir. |
| Issue 2 | Low flows in the River Lathkill. |
| Issue 3 | Wrong sewerage connections in Derby. |
| Issue 4 | Water quality in the Lower Derwent |
| Issue 5 | Obstructions and water quality in the River Amber limit fisheries potential. |
| Issue 6 | Natural brown trout populations are limited in the Rivers Ashop and Noe. |
| Issue 7 | Discharges to underground strata in the carboniferous limestone of Derbyshire. |
| Issue 8 | Pollution by sheep dip chemicals. |
| Issue 9 | The lack of availability of future landfill space. |
| Issue 10 | The threat to water quality posed by closed landfill sites. |
| Issue 11 | Possible pollution effects from the spreading of waste on land. |
| Issue 12 | Fly-tipping of domestic waste. |
| Issue 13 | Loss of habitat to invasive plant species. |
| Issue 14 | The use of helicopters to spray herbicides may affect water quality in potable supply catchments. |
| Issue 15 | Recreational facilities and access along river valleys. |
| Issue 16 | The rich archaeological and historical resource of the Derwent Valley requires protection. |
| Issue 17 | Disparity between abstraction licensing policies for surface water and groundwater. |
| Issue 18 | Biodiversity protection. |

More issues and questions overleaf

Derbyshire Derwent Local Environment Agency Plan - February 1998

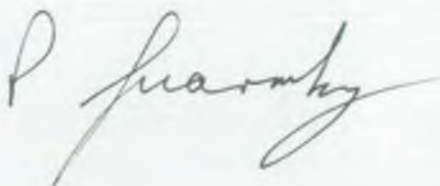
Foreword

LOCAL ENVIRONMENT AGENCY PLANS (LEAPs) are action plans to protect and improve the environment for present and future generations.

This report starts the consultation process with customers, the local community and interested organisations in arriving at an **agreed** action plan for the area.

We have identified key environmental issues affecting the Derbyshire Derwent area in consultation with various groups. We need to confirm that we have identified all the issues and options to resolve them. Some of the issues are not clear cut - there will always be some groups who may be adversely impacted by some of the proposals. We need to ensure that we achieve a balance between the conflicting demands placed upon our natural environment.

We therefore seek your views and/or support to achieve consensus on the issues and proposed action. Many of the issues raised in this report can only be resolved through the actions of others. We therefore need to work in partnership with pressure groups, those we regulate and other organisations to agree and implement proposed actions and improve the environment of the Derbyshire Derwent area.



Peter Quarmby

Area Manager - Lower Trent

Midlands Region



This report has been produced on Sylvancoat Recycled Paper and Board



Acknowledgements

This report has been compiled by the Environment Agency with contributions from key organisations operating in the area.

The following Agency staff are members of the Project Group responsible for the development of this report. Other members of staff have also contributed through the Project Group.

Simon Bullett	Water Resources Officer
Karen Devonport	Planning Liaison Officer
Andrew Disney	LEAP Officer
Keith Easton	Fisheries Scientist
Colin Guest	IPC/RAS Pollution Inspector
Tony Hallam	Team Leader-Development Control
Phil Harding	Area Biologist
Alison Hepworth	LEAP Planner
Valerie Holt	Conservation and Recreation Officer
Peter Hufton	Team Leader-Environment Protection
Peter Orban	Waste Management
Chris Thomas	Senior Hydrogeologist

This is the second plan to involve the Lower Trent Area Environment Group, our local consultative panel for all aspects of Agency activity. The Agency wishes to express its thanks to the Area Environment Group, in particular the Derwent Sub-Group for their comments and advice regarding the production of this report. The Agency would also like to thank Malcolm Hawes of the Farming and Rural Conservation Agency who kindly provided the Environment Agency with valuable information.



Photograph 1 - Pride Park (see Issue 22)

The Derbyshire Derwent

Welcome to the Environment Agency's second LEAP for the Lower Trent Area. This is a local plan for the physical environment which covers a large part of Derbyshire and includes small parts of Nottinghamshire and South Yorkshire. The area is based on the River Derwent catchment (see map 1 on the inside cover).

River catchments provide firm water environment boundaries which are important for a plan based on the physical environment.

The Derbyshire Derwent area covers 1,200 km² and extends from the South Pennines west of Sheffield to the confluence with the River Trent south-west of Nottingham. The plan area covers about 46% of Derbyshire and includes a small area of Nottinghamshire west of Mansfield and two small areas of South Yorkshire to the west of Sheffield. Derby is the largest settlement in the plan area. Other towns in the area include Bakewell, Belper, Buxton, Matlock and parts of Alfreton and Ripley. It is home for about 375,500 people. In terms of land use the area is essentially rural, away from the centres of Derby, Alfreton and Belper. Behind the rural charm of the area, however, mining and quarrying are still important, as they have been historically. Evidence of such activity can readily be seen. Mills located throughout the Derwent Valley also indicate some of the history of the area.

Brian Cooper wrote of the Derwent Valley as a place where *"....beauty has returned. The gaunt industrial structures still remain, but time and weather have fretted their harshness and softened their outlines to merge with the landscape; while the shadows of the men who laboured to construct them, and the women and children who toiled by the light of candles within them, still move across their walls and among their tumbled stones: the ghosts of our past, who, out of faith or sheer necessity, set the Derwent Valley, for a moment of time, in the forefront of history and made of it a cradle within which the Industrial Revolution grew to strength."*

Brian Cooper - Transformation of a Valley (1991) Scarthin Books.

A Vision for the Derbyshire Derwent

Man's activities generate waste and this needs to be disposed of whether to land, air or water. Public demand and industry have put pressures on our water resources. In addition, land use changes and development have resulted in a loss of wildlife and habitat. These growing demands and pressures mean that different areas have different needs, that opinions contrast and uses conflict. The Agency's challenge is to:-

- Balance these demands and conflicts.
- Protect our natural resources whilst realising the needs of the local community.
- Work in partnership with the local community to realise the environmental potential of the area.

The Agency's aim is:-

"A sustainable local environment that is attractive, clean and diverse; balancing the needs and aspirations of people whilst maintaining and enhancing the diversity of flora and fauna. An environment that contributes to the economic and social well being of the area."

The key objectives of the Agency in the plan area are to:-

- Protect the groundwater quality of the Carboniferous Limestone area from sewage discharges and the spreading of waste to land.
- Ensure there is a sustainable supply of water for abstractors which does not compromise the needs of flora, fauna and amenity.
- Ensure that recreational interests are managed in a way that is not harmful to the local environment and takes into account the requirements of other interests.
- Work with industry to reduce water usage and minimise waste generation.
- Protect the archaeological and historical resource of the area.
- Ensure the water quality of the Lower Derwent is sustainable.
- Assist in the preparation of a strategy to control invasive plants.
- Ensure the use of herbicides does not affect potable water supplies.
- Investigate the feasibility of protecting undefended properties from flooding and enhancing flood defences that are inadequate.
- Enhance and protect biodiversity.
- Develop local waste minimisation programmes to meet national waste targets.
- Educate and raise awareness of the environment and environmental issues.

This is the Agency's draft vision for the Derbyshire Derwent. We are keen to hear from you if you agree with this vision or whether you have an alternative vision for the area.

The Derbyshire Derwent

Local Environment Agency Plan

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PART I

The Management Plan

This management plan is Part I of the Consultation Report and introduces the work and responsibilities of the Environment Agency and the LEAP process. It explores the resources of the area and highlights the environmental issues that we consider need to be tackled. It also looks at partnerships, areas of joint working and the work of others which, in the long term, will raise the quality of the local environment.

The management plan is divided into four sections:-

Section 1 - Introduction This section is an introduction to the Environment Agency and to the LEAP process. It highlights the role of the Agency in terms of sustainable development and biodiversity.

Section 2 - Overview This section provides a general description of the plan area and the resources of air, land, water, wildlife and heritage.

Section 3 - Issues and Options Here we identify the issues and problems that we consider should be addressed locally in the short to medium term and put forward a number of options for their resolution.

Section 4 - Protection through partnership This section looks at partnerships, land use planning and education which can be used to address longer term issues and problems and raise the quality of the local environment.

The management plan is supported in Part II by information on the activities, uses and pressures on the environment and the state of the local environment as measured by the Agency and others in relation to local, national and international targets.

1 Introduction

1.1 The Environment Agency

The Agency covers England and Wales (with separate organisations for Scotland and Northern Ireland). It is divided into eight regions and a further twenty six areas. The Derbyshire Derwent area is one of four LEAP areas in the Lower Trent Area of Midlands Region (see table 1).

The principal aim of the Agency under Section 4 of the 1995 Environment Act is:-

"To protect or enhance the environment, taken as a whole, in order to play its part in attaining the objective of sustainable development, as guided from time to time by ministers."

LEAPs are an important tool in meeting that aim.

The vision for the Agency is:-

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

The Agency's main roles are in pollution prevention and control, water resource management, flood defence, conservation, recreation and navigation. The protection and management of the environment by the Agency is based on powers and duties provided by a number of different Acts which were brought together under the Environment Act 1995.

To achieve our principal aim, we use statutory powers and seek to collaborate and build partnerships with numerous organisations and individuals. These include local government, industry, conservation groups, farming interests and the general public.

Our work and responsibilities do not cover all aspects of environmental legislation or services to the general public. There are other statutory and non statutory bodies which have responsibility within the plan area, for example, Local Authorities deal with statutory nuisance problems including noise and litter, as well as air pollution arising from traffic, households, small businesses and industry.

We depend on the public to report environmental incidents. The Agency has the following freephone hotline number available 24 hours a day.

0800 80 70 60

Your prompt action helps us to protect the environment. Please use this number to report on pollution incidents or river flooding. Reports about litter, noise nuisance and flooding from road drains should be reported to your Local Authority.

1.1.1 Regional Committees and Area Environment Groups (AEGs)

In order to support openness, objectivity and accountability, the Agency is required by law to consult committees on all aspects of its work. Membership of the regional committees consists of local people drawn from public life including industry, agriculture, Local Authorities and environment groups.

The Midlands Region is served by three committees:-

- Regional Environment Protection Advisory Committee (REPAC)
- Regional Flood Defence Committee (RFDC)
- Regional Fisheries Advisory Committee (RFAC)
(this includes, conservation, recreation & navigation relating to the water environment)

REPAC and RFAC are advisory committees, while RFDC has executive powers relating to capital expenditure for flood defences.

1 Introduction

The Lower Trent Area is served by its own Area Environment Group (AEG). Membership consists of local people who live or work in the area and who represent a wide range of interests. These include Local Authorities, industry, agriculture, conservation, amenity and recreational interests and riparian owners. The group will advise the Agency on LEAPs, the delivery of local services and act as a link between the local community, the Agency and its statutory committees. The AEG has set up sub-groups to consider all draft LEAP documents. Five members are involved with the development of this LEAP.

1.2 Local Environment Agency Plans (LEAPs)

LEAPs are a first step towards environmental planning. The plans are non-statutory integrated action plans based on river catchments. They provide a focus for those concerned with the future of the local area.

LEAPs help to fulfil our principal aim of contributing to sustainable development through integrated environmental management and improvement. They also play a role in;

- promoting openness and accountability
- developing closer links with local community and other agencies
- educating and informing the public on local environmental issues
- prioritising the Agency's work through an action plan for managing and improving the local area over the next 5 years
- realising the environmental potential of the area
- forming joint actions and partnerships for environmental improvement.

1.2.1 The Consultation Report

This document, the Consultation Report, is the first output from the LEAP process, and is not the final plan. To assist in the preparation of this report, an informal consultation exercise was undertaken with a range of organisations and groups in July 1997. Those consultees who responded are listed in Appendix 2.

Through consultation a shared vision will be developed, along with a strategy for action. This will guide all Agency activities for the next five years and influence the activities of other groups. Public participation is important as it increases environmental awareness and encourages greater involvement and ownership of the local environment.

The action plan will set out the vision, a costed action programme for environmental improvement and supporting policies and partnerships.

Regular monitoring and updating of the plan will be an integral part of the process. Annual review reports will be published leading to a full review and fresh consultation at the end of five years.

The Derbyshire Derwent LEAP is part of a national programme whereby every catchment in England and Wales will be expected to produce a LEAP and reach consultation stage by 31 December 1999. In order to achieve this deadline a timetable for LEAP production for the Lower Trent area has been developed. This should ensure that all consultation reports have been produced by October 1999. The Lower Trent Area LEAP programme is shown in table 1.

1.2.2 LEAPS and other plans

The Agency shares the regulation and management of the environment with others. Whilst LEAPs are the Agency's plans, their content and development will reflect these shared responsibilities. LEAPs will compliment and integrate with other organisations' plans such as Waste Local Plans, Local Air Quality Management Plans, Local Development Plans and Local Agenda 21 plans.

1 Introduction

Table 1 - Lower Trent Area LEAP programme

Catchment	Start	Consultation Starts	Issue Action Plan	1st Annual Review
Soar	October 1996	April 1997	March 1998	May 1999
Derwent	April 1997	January 1998	November 1998	January 2000
Lower Trent	February 1998	October 1998	July 1999	September 2000
Idle & Torne	February 1999	October 1999	July 2000	September 2001

1.3 Sustainable Development

The most commonly used working definition of sustainable development was provided in 1987 in the Brundtland Report "Our Common Future";

"development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Rather than predicting ever increasing environmental decay and hardship in a world of ever decreasing resources, the report saw the *"possibility of a new era of economic growth, based on policies that sustain and expand the natural environmental resource base"*.

Sustainable development does not necessarily mean less economic development. One of the challenges is to promote ways of encouraging environmentally friendly economic activity, and of discouraging or controlling environmentally damaging activity.

To achieve sustainable development, all stakeholders should contribute to decision making and implementation. It is important that dilemmas and problems are resolved in ways that take account of the views of those concerned, for without widespread support, little will be achieved.

Allied to sustainable development are a raft of other complimentary programmes on climate change, biodiversity, forestry and Local Agenda 21 developed from the United Nations Conference on Environment and Development at Rio, Brazil, in 1992.

1.3.1 The Role of the Environment Agency and LEAPs

Government Ministers have considered the Agency's contribution to sustainable development and issued guidance in November 1996. It concluded:-

- The Agency needs to take a holistic approach to the protection and enhancement of the environment....to strive through its actions to optimise benefits to the environment as a whole taking account of likely costs and benefits. The Agency should make use of integrated environment management planning or other geographic planning tools.
- The Agency should take a long term perspective.
- The Agency should conserve and, where practicable, enhance biodiversity and protect natural heritage.
- The Agency should work to protect the global atmosphere.
- The Agency should reconcile the needs of the environment and development by regulated organisations, adopting improved technologies and management techniques and working, where possible, in partnership with regulated organisations.

1 Introduction

- The Agency should develop close and responsive relationships with the public, Local Authorities, regulated organisations, and public bodies with environmental responsibilities. It should also strive to work in partnership with all such groups, for example in developing integrated environment plans.
- The Agency should provide high quality and readily accessible information and advice.

LEAPs therefore play an important part in the Agency's contribution to sustainable development and will help us to meet many of the objectives set by Ministers.

1.4 Biodiversity

1.4.1 Definition of Biodiversity

"Biodiversity" is a new term meaning the variety of life. The importance of biodiversity conservation has been recognised internationally through the development of a Biodiversity Convention intended to ensure the conservation of the full range of existing plant and animal species.

The Agency has significant responsibilities regarding implementation of the UK Biodiversity Action Plan and will be developing targets for species and habitats of conservation concern. These relate to the targets for key wetland species and habitats as identified in the UK Biodiversity Action Plan, and in this report we emphasise the contribution that the Lower Trent Area can make to national targets.

Nationally, the Agency is a "contact point" or co-ordinating body under the Action Plan for 12 species and for chalk river habitats. Chalk rivers are not found in this Region. The Agency has produced a Biodiversity Strategy for the Midlands Region. This concentrates on aquatic and wetland species and habitats identified in the Steering Group Report which are found in this Region. Details are given in Issue 18.

1.5 Climate Change

Addressing the causes and effects of climate change is one of the Environment Agency's principal and immediate environmental concerns. It is generally accepted that increased levels of carbon dioxide, a "greenhouse gas", have contributed towards a warming of the Earth's atmosphere. In December 1997 the United Nations Climate Change Summit was held in Kyoto, Japan*, to discuss proposed reductions in levels of carbon dioxide production.

There are many fears that change climate will result in increased sea levels, resulting in loss of land, as well as a warmer and drier environment in many countries. A drier environment will increase water stress, affect agricultural practices and have a detrimental effect upon wildlife and habitat.

The Agency have brought in several measures to address climate change and will:-

- Help to ensure that the Government's greenhouse gas emission reduction targets are met.
- Develop methods to improve our estimates of the emission of methane into the atmosphere from landfill sites.
- Promote tax incentives to reduce energy production from burning fossil fuels.
- Set an example by reducing our own energy and fossil fuel consumption.
- Invest in research to predict the likely effects of climate change on the environment of England and Wales, and how to manage them.

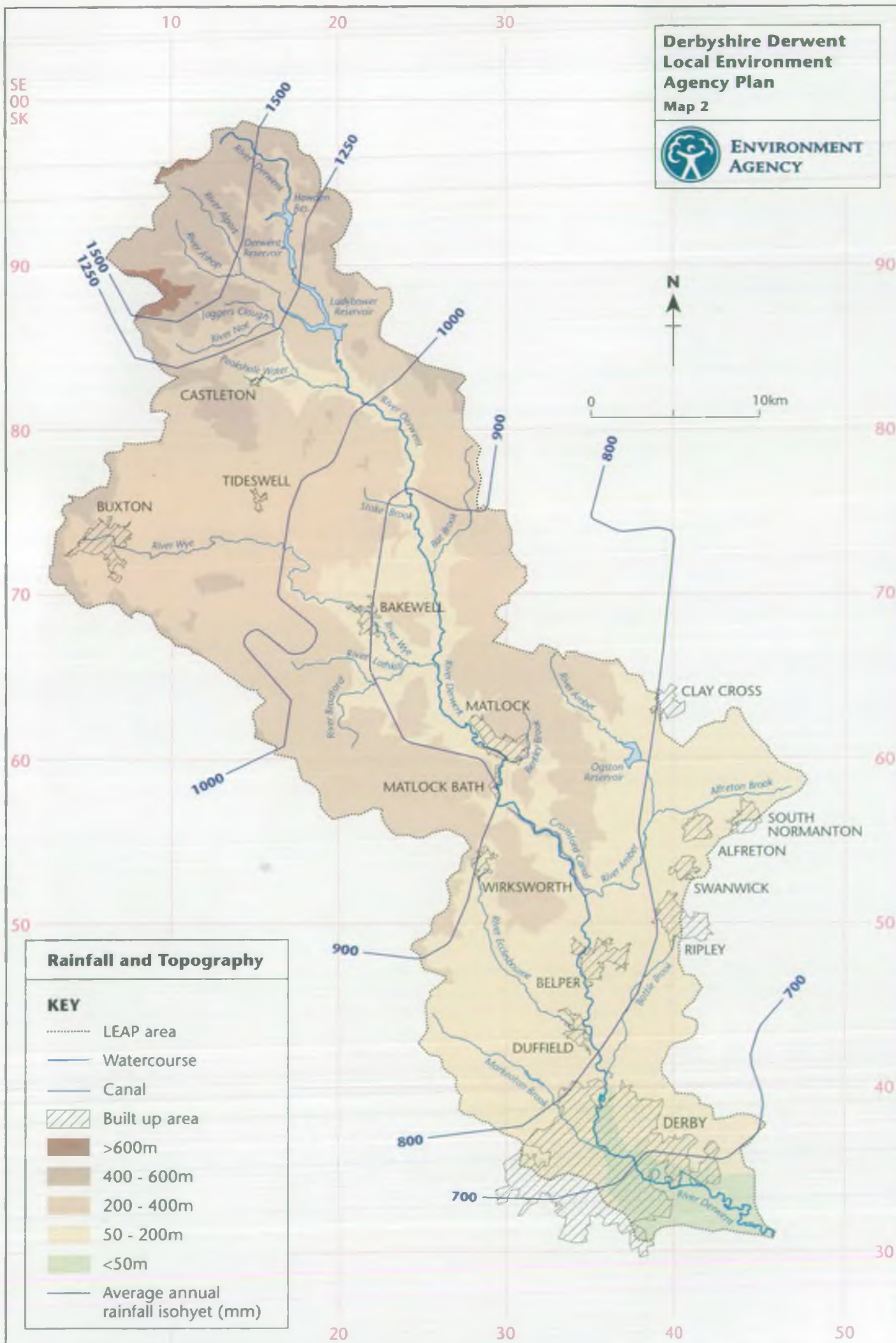
1 Introduction

- Provide improved mapping of low-lying areas at risk from sea-level changes.
- Develop techniques to identify changes in plant life, using remote sensing techniques, to measure the effects of different weather patterns in sensitive areas.
- Contribute our knowledge and expertise to national and international forums dealing with climate change.

* The Kyoto conference was held at the time this document went to print.



Photograph 2 - The M1 in Derbyshire. Predicted increases in traffic on our roads will increase pressure on our environment.

ENVIRONMENT
AGENCY

2 Overview

The Local Environment

Introduction

The Derbyshire Derwent area is defined by the area of land that drains to the River Derwent before its confluence with the River Trent. The extent of the area is shown on Map 1, at the front of this report.

The Derbyshire Derwent area is important in terms of water resources with the Derwent, Howden and Ladybower Reservoirs being located in the Upper Derwent area. The rainfall levels reflect a wide variation between the upland and lowland Derwent area. In the north of the plan area the average annual rainfall is in excess of 1451mm, whereas in the lowland area around Derby annual rainfall levels are between 616mm and 705mm. Rainfall and topography are shown on Map 2.

The Upper Derwent area (see Map 2) is a hilly area renowned for its beautiful and spectacular scenery as well as its charming villages, much of which falls within the Peak District National Park boundary. The National Park was designated in 1951 and was the first of 10 National Parks to be established in England and Wales with a total area of 1438 sq.kms. The National Park is situated in the centre of England, it is surrounded by large towns and cities in the North-West, Yorkshire, East Midlands and the West Midlands. Approximately 17 million people live within 86 km of the National Park boundary and some 20 million visitors come to the Park each year.

In terms of transport links, the M1 runs in a south to north direction to the east of the area, crossing the plan area briefly to the east of Alfreton. The A6 Trunk road is the main highway that passes through the area. It follows the River Derwent predominantly from its confluence with the River Trent until it meets the River Wye at Rowsley where it follows this watercourse through to Buxton. Derby is a central rail link with main line connections to London, the south-west and the north-east (see Map 3).

The local economy is focused towards tourism and recreation in the north of the area. In the south of the plan area, companies such as Rolls Royce and Courtaulds are significant in the local economy as well as the skyline of Derby. The Toyota factory is significant to the local economy despite being located just outside of the plan area. Quarrying is also a significant activity, in particular in the north of the area, in terms of its influence upon the local economy and its visual impact. Within the City of Derby, such schemes as the Pride Park City Challenge have promoted development within the area. Farming is also an important activity both in terms to the local economy and to the environment (see section 5.6 for more details).

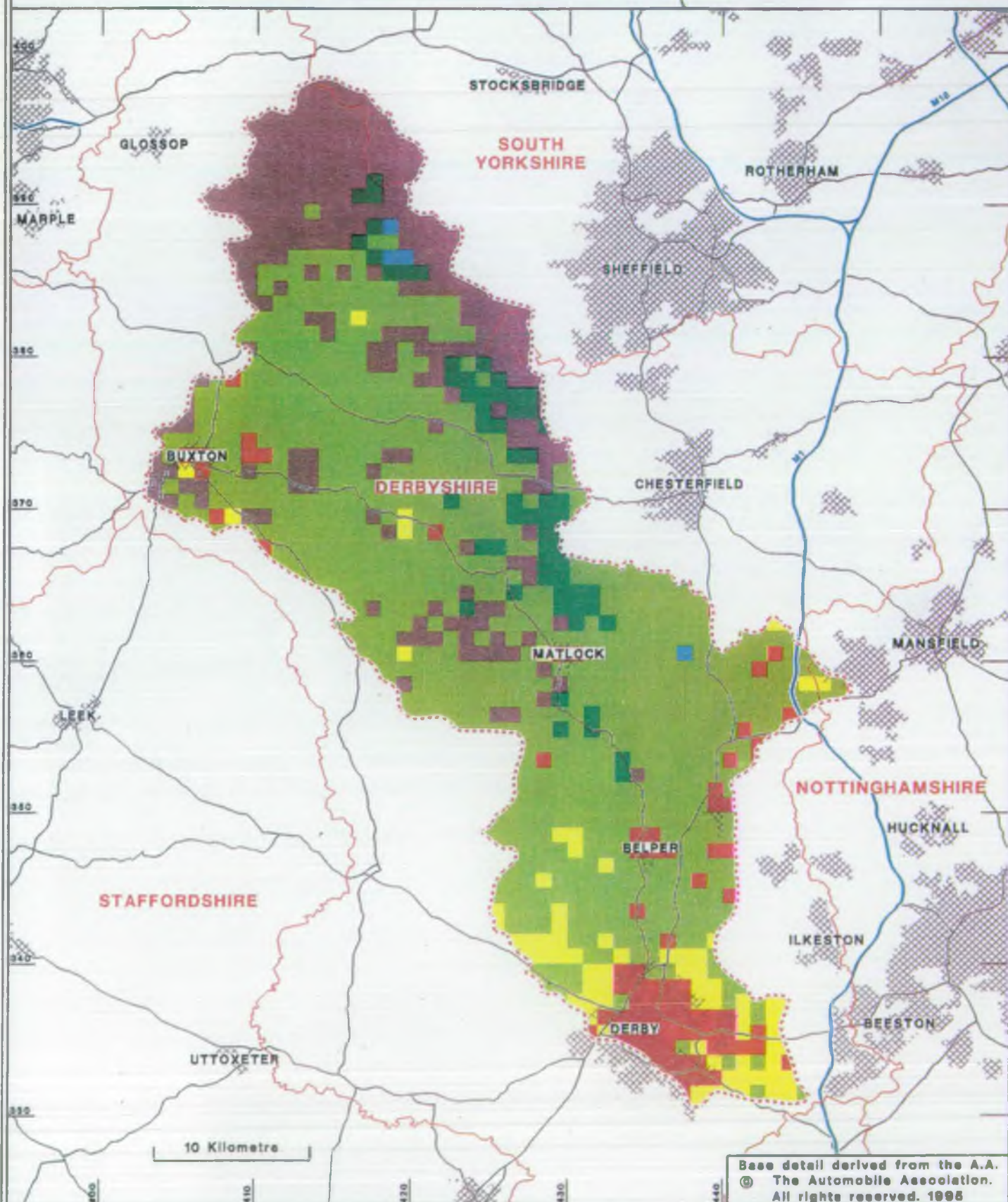
2.1 Land

2.1.1 Landscape







The Countryside Commission has recently designated Countryside Character Areas (CCA) for England and Wales, dovetailing with Natural Areas drawn up by English Nature. These are shown on Map 6. The Yorkshire Southern Pennine Fringe, Nottinghamshire, Derbyshire and Yorkshire Coalfields, and Leicestershire and South Derbyshire Coalfield CCAs all form part of the Coal Measures Natural Area around Alfreton. This area is industrialised, showing much evidence of past coal mining activity, and agricultural use tends to be pasture. The Southern Magnesian Limestone area is a narrow band of rising ground separating the Pennines Fringe from the Coalfields. Only a small portion of this CCA is within the plan area.

The Derbyshire Peak Fringe and Lower Derwent, the Dark Peak and the White Peak form the bulk of the plan area and follow the River Derwent and tributaries from the man made reservoirs in the Dark Peak down through the Dales and on to Derby and the confluence with the River Trent. The upper areas tend to be rural and undisturbed but this is broken by the quarrying activities. The Dales and middle reaches have been strongly influenced by man, harnessing the water for mill operation. The wooded gorges of the Dales on the River Wye, and at Matlock provide a distinctive landscape. The estates of Chatsworth and Haddon cover vast areas and provide a landscape of open grazing, dotted with mature trees. At the lower reaches the river valley runs through urban fringe and industrial dereliction in Derby (see Issue 22). The river then flows through grassland and arable areas, with wide floodplains, to its junction with the River Trent. In this stretch the area is part of the Trent

DOMINANT LAND COVER BY 1 KILOMETRE SQUARE DERWENT LOCAL ENVIRONMENT AGENCY PLAN



LAND COVER

	Grassland		Urban\Bare Ground
	Moorland\Heath		Woodland
	Arable		Open Water

(Data Source: ITE Land Cover)

Base detail derived from the A.A.
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Map produced by
Resource Planning Team,
Farming and Rural
Conservation Agency - Leeds.
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2 Overview

Valley and Rises Natural Area (See Section 2.4 for more details). In terms of dominant land cover details are shown on Map 4.

The National Rivers Authority, prior to becoming part of the Environment Agency, undertook a River Derwent Strategic Landscape Assessment in November 1995. This survey tied the CCAs with the river corridor and its floodplain.

2.1.2 Groundwater

i) Geology

The plan area includes a great variety of rock formations and landforms. Natural features such as cliffs and outcrops, together with human activity like mining and quarrying, mean that rock formations are visible to the public in many locations.

The headwaters of the River Derwent rise on an area of Millstone Grit with a band of Carboniferous Limestone to the west of the area. East of Matlock the area is dominated by Coal Measures. The north of the LEAP area is characterised by a series of discontinuous water bearing sandstone horizons subdivided by impermeable shales and mudstones. These are overlain to the south of the area by a narrow outcrop of Permo-Triassic Sherwood Sandstone Formation and, in turn, the Mercia Mudstone Formation under the City of Derby. The geology of the area is shown on Map 5a.

Alluvial and glacial drift deposits, including sands, gravels, silts and clays, commonly overlie these strata throughout the area.

ii) Hydrogeology

Both the Carboniferous Limestone and the Sherwood Sandstone sequences are classified as Major Aquifers, and both tend to yield good quality groundwater. These are shown on Map 5b. The Sherwood Sandstone is capable of supporting large abstractions for private and public water supplies. The Carboniferous Limestone, however, holds groundwater within fissures and voids which reduces accessibility by abstraction. Transmission of contaminants via fissure systems in the limestone strata can be extremely rapid and the aquifer is, consequently, also highly vulnerable to pollution incidents (see Issues 7 to 11). Although abstractions directly from the limestone are limited, the aquifer supplies substantial baseflow for the River Wye and the River Derwent (which are used for abstraction, further downstream).

The Millstone Grit and Coal Measures are Minor Aquifers, providing locally important groundwater sources for agriculture and industry. The Mercia Mudstone is classified as a Non-aquifer, although small groundwater yields are obtainable where sandier layers called skerry bands are encountered.

Sand and gravel drift deposits form localised Minor Aquifers, and support many small abstractions for agricultural and industrial purposes.

2.1.3 Waste

i) Waste Arisings

To date there are no figures available that detail the amount of wastes being produced in the Derbyshire Derwent plan area. The exception is the availability of domestic waste collection figures, held by the District Councils. In Derbyshire no Draft Waste Management Plan was produced and any further details mentioned have come from Agency sources at regional and local levels. The details will reflect the county of Derbyshire as a whole and not the Derbyshire Derwent plan area.

A Waste Strategy Unit has recently been set up to provide relevant statistics on waste arisings in Derbyshire. The Agency has a statutory responsibility to survey waste disposal needs and priorities in order to advise the Government in its preparation of the Waste Strategy. To satisfy this requirement the Agency will be undertaking a national survey of waste arisings starting in 1998.



2 Overview

ii) Waste Disposal/Treatment in Derbyshire

In Derbyshire in 1995/96 an Agency regional study determined that over 1 million tonnes of waste was landfilled in the county. The majority of wastes landfilled were either household waste, construction/demolition waste or other industrial/commercial wastes.

Under 85% of the waste landfilled in Derbyshire arises in the county, and as Derbyshire exported only 23,000 tonnes of waste compared to in excess of 1 million that was landfilled in the county, it can be seen that Derbyshire is a net importer of wastes.

2.2 Air

2.2.1 Air Quality

The Agency contributes to the control of air quality mainly through regulation of emissions to air from Part A processes¹ authorised under the Environmental Protection Act 1990.

Air pollution may be in the form of gas or particulate matter and its impact may be local or widespread. Pollutant dispersion from Part A processes is complex and depends on the height at which it is discharged, its physical properties, the prevailing climatic conditions and the local topography. Local effects tend to arise from polluting gases or dusts grounding prematurely rather than remaining airborne, for example odours and dust deposition. Widespread effects can include ozone depletion and the "greenhouse effect" both of which contribute to global warming.

The air quality with regard to sulphur dioxide and nitrogen dioxide within the Derbyshire Derwent catchment is generally very good or good, being mid-range or better for the bands identified. Major conurbations usually have higher levels of sulphur dioxide and nitrogen dioxide in the air than do other areas. Derby is the only large city within the catchment and here, although the air quality is slightly poorer, it is still classified as very good or good. The north of the plan area is however situated between the major conurbations of Manchester and Sheffield which may influence the air quality in this area depending upon wind direction.

Episodes of elevated ozone concentration at ground level can occur almost anywhere, even in rural areas. These are caused by complex interactions between Volatile Organic Compounds (VOCs) and nitrogen dioxide in the presence of ultraviolet light. Since these particular pollutants arise from many sources, some within but many more outside the catchment area, these elevated ozone episodes require action at the national level to reduce their frequency and impact.

¹Processes which are prescribed in the Environmental Protection (Prescribed Processes and Substances) Regulations 1991 are either prescribed for central control (Part A processes, subject to Integrated Pollution Control - IPC) or for Local Authority control (Part B processes).

2.3 Water

2.3.1 Water Quality

For the purposes of the Derbyshire Derwent LEAP the overview of the water quality for the River Derwent has been divided into three sections as shown on Map 12. The overview starts from the headwaters of the River Derwent working its way downstream to the confluence with the River Trent.

i) Upper Derwent

The Upper Derwent and its principal tributaries are generally of good water quality. These upper reaches drain mainly moorland areas over gritstone, and are sources for the Derwent Valley reservoirs.

The River Noe is the first major tributary downstream of the reservoirs. The Noe system drains gritstone areas in

2 Overview

the north and limestone areas to the west. Both the River Noe and its major tributary Peakshole Water are of good quality.

The area is predominantly limestone downstream of the River Noe confluence. Limestone quarrying activities have resulted in a number of problems in the area. One example is Stoke Brook where the biological quality and visual appearance of the brook have been affected by discharges from two major quarry sites and a mineral processing plant. However since the provision of adequate treatment facilities and other pollution prevention measures, the quality of the brook has improved noticeably. Further problems in the limestone area are discussed in Issues 7 to 11 (See Section 3).

Buxton lies at the headwaters of the River Wye. Downstream from the town the quality of the water is fair, presumed to be due to the intermittent pollution from the numerous drainage connections made into the culvert. Downstream of Topley Pike however the quality improves to good and is sustained at this quality until it meets the River Derwent at Rowsley.

The River Derwent in Matlock receives drainage from the Bentley Brook. The quality of this watercourse is good in its upper reaches, however it receives a discharge of treated effluent from a dyers in Tansley and there is a corresponding decline to a fair quality.

The River Derwent at Homesford receives drainage from the Meerbrook Sough system (see glossary). This large sough picks up drainage from Wirksworth, Cromford, Brassington and Hopton. The sough is a source of high quality groundwater, much of which is abstracted by Severn Trent Water Ltd for drinking water.

ii) Middle Derwent

The overall water quality of the River Derwent reduces from upstream of Ambergate to Allestree due largely to the impact of the River Amber.

The first significant tributary of the River Amber is Press Brook which is a mainly rural stream but receives effluent from Clay Cross Sewage Treatment Plant (STP) and a number of Storm Water Overflows (SWOs). The Alferton Brook then joins the Amber. The combination of sewage and industrial effluents total approximately 86% of the total dry weather flow of the brook (see issue 5). At Bullbridge and Ambergate there are a number of abstractions and discharges occurring, including a dyeworks. The quality of the River Amber changes correspondingly to the discharge from the dyeworks.

The River Derwent, downstream of Ambergate, flows through mainly rural land until it reaches Belper, a centre of diverse industry. The town is predominantly served by a foul sewerage system (with its corresponding SWOs) which does not impact on the overall water quality of the river. Belper is however a popular fishing location and the presence of gross solids and sewage debris is obviously viewed unfavourably amongst the fishing community.

Downstream of Belper is the village of Milford which is industrialised and includes an iron foundry which abstracts and discharges cooling water to the river.

The river flows through a rural setting once past Milford and does not receive any further significant effluents other than from Duffield STP. At Duffield the River Ecclesbourne joins the River Derwent. This watercourse drains mainly rural land. The town of Wirksworth is situated at the headwaters of the river and the town's STP is a major contributor to the river.

At Little Eaton, Severn Trent Water Ltd abstracts from the river for treatment at the Little Eaton Water Treatment Works. The Bottle Brook meets the River Derwent downstream of the abstraction point. This watercourse is affected by significant quantities of sewage effluent along with the influence of clay quarrying and opencast mining in the upper reaches which affect the water quality correspondingly. The quality however does improve as the watercourse flows to the River Derwent.

2 Overview

iii) Lower Derwent

The lower reaches of the River Derwent are fed by a variety of tributaries draining both rural and urban catchments. The water quality ranges from good to fair.

The major tributary for the River Derwent in this section is the Markeaton Brook/Mackworth Brook system which joins the Derwent in Derby. This system is predominantly rural upstream of Derby itself. Once the watercourse passes through the city centre in culvert the quality deteriorates from the influence of poorly operating SWOs.

There are also two watercourses, Littleover Brook and Bramble Brook which drain residential areas and join this system.

The Litchurch and Cotton Brook systems join the River Derwent at Alvaston Park. These are culverted watercourses that drain heavily industrialised areas. There are a number of large surface water sewer systems that drain urban areas directly to the River Derwent and intermittent pollutions have occurred on these as well as culverted sections of minor tributaries.

Downstream of Derby the River Derwent flows through three loops. Situated on two of these loops are Derby STP and Courtaulds Chemicals. In combination these two sites influence the water quality in the Derwent with the resulting organic load from Derby STP causing a eutrophication problem. The quality of the River Derwent is further impacted upon by the Southern Surface Water Sewer (SSWS). The water quality of the Lower Derwent is discussed further in Issue 4.

The River Derwent recovers on the lower section downstream of Borrowash to the confluence with the River Trent and water quality remains at the required limits for abstraction at Draycott for public drinking water supply.

2.3.2 Fisheries

Angling is an important activity within the plan area with very high value trout fisheries on the Rivers Derwent, Wye and Lathkill. In addition there are excellent reservoir trout fisheries in the upper reaches of the area. The lower Derwent is a particularly good quality coarse fishery and there are a number of gravel pit still water fisheries in the floodplain.

2.3.3 Recreation

The Peak National Park is very popular with visitors having many activities to offer. Tourists visit the impressive gorges found along the Wye Valley and the Derwent Valley at Matlock and Matlock Bath. At Matlock Bath one of the associated tourist attractions is a chair lift to the top of the gorge. Riber Castle dominates the gorge from its very fine position on top.

Grouse shooting takes place on the moors of the Dark Peak, but walking and climbing bring most visitors. The southern end of the Pennine Way starts at Edale near Kinder Scout. Many cycle routes have made use of old railway tracks. Camping and caravanning are catered for at several locations throughout the area and one campsite at Birchen Edge has been provided specifically for climbers. The 'edges' offer many good climbs along with the cliffs at Matlock and Black Rocks near Wirksworth. Horseriding takes place along the bridle ways but there are problems with All Terrain Vehicles causing erosion to paths and tracks.

The reservoirs at Ladybower, Derwent, Howden and Ogston provide 'put and take' trout fisheries, with facilities for disabled anglers at Ladybower. Ogston also has a sailing club operating on the water. A canoe slalom course has been installed in the River Derwent at Matlock.

In Derby, Project Riverlife, supported by the Countryside Commission, English Nature, Courtaulds and the Agency, have constructed a walkway and cycle route from Borrowash to Darley Abbey.

A new interpretive centre at Belper shows how the rivers have been used for industrial purposes over several

2 Overview

hundred years. There are many other museums, craft centres and other visitor attractions throughout the plan area.

The River Derwent has a right of navigation from Derby downstream to the River Trent and at one time canals linked Derby with the Trent and Mersey Canal near Swarkestone, and the Erewash Canal near Sandiacre. The Cromford Canal ran north from the end of the Erewash Canal at Langley Mill. On other parts of the River Derwent the riparian owners use the river for boating, for example in Belper.

Church Wilne lagoon, adjacent to the water supply reservoir, offers facilities for power boating and water skiing. Map 17 highlights recreation sites where the Agency has some direct influence.

2.3.4 Flood Defence & Land Drainage

i) Flooding History

The Derwent Valley has historically suffered from frequent and extensive flooding with notable events occurring in 1875, 1881, 1901, 1907, 1921, 1922, 1928, 1929, 1931, 1932, 1941, 1947, 1957, 1960, 1965, 1967, 1970, 1977 and 1978. A number of flood alleviation schemes have been undertaken to protect the urban areas of Draycott, Shardlow, Great Wilne, Ambaston, Derby, Little Eaton, Matlock, Darley Bridge and Duffield from Main River flooding (see glossary for the definition of Main River).

ii) Flood Warning

The Agency operates a flood warning service across England and Wales. Since September 1996 the Agency has taken the lead role in passing flood warnings to people at risk in order that they can take the necessary action to protect themselves and their properties. The latest technology is used to monitor rainfall and river levels for 24 hours a day, 365 days a year. The flood warning service is provided for certain reaches of main river where there is a risk to people and property and where there is insufficient time for the warnings to be effective. Flood warnings are issued to the police, Local Authorities and the public through a variety of media including AA Roadwatch, Teletext, radio and television. The Agency also provides a Floodcall 'dial and listen' service which provides 24 hour recorded information on the latest flooding situation. The Rivers Derwent and Wye are the watercourses which the Agency will issue flood warnings for in this plan area.

It should be noted that the Agency uses the best information available to predict the possibility of flooding but no warning system can cover every eventuality. It is the responsibility of those who live in flood prone areas to be aware of any risk and to know what action should be taken to protect themselves if flooding occurs.

2.3.5 Water Resources

Water resources within the LEAP area have been extensively developed, making the River Derwent one of the most heavily managed rivers in England and Wales.

The primary consumptive use of water in the area is for public water supply. There are a number of large reservoirs at the headwaters of the River Derwent (Howden, Derwent and Ladybower) and the River Amber (Ogston). In addition there are large river abstractions at Ambergate, Little Eaton and Draycott. Boreholes in the Carboniferous Limestone aquifer near Buxton also provide public water supplies. There is a net loss of water from the catchment for public water supply, with supplies going to Sheffield, Nottingham and Leicester.

Industrial water use makes up the next highest use, from large chemical works such as Courtaulds Chemicals at Derby to numerous small rural industries. Dewatering and licensed abstractions from mineral processing sites can have a big impact on water resources and are especially prevalent in the Buxton area, associated with limestone extraction.

In terms of impact upon the river, the main use is for hydropower. There are many mills on the River Derwent and its main tributaries which produce power for the National Grid. If these sites are operated improperly they can have severe impacts on levels and flows in the river which affects other abstractors and the environment.

The control and management of these demands upon the surface water system and the aquifers requires the

2 Overview

Agency to monitor the state of the resources through a network of groundwater level monitoring sites, river flow gauges and rainfall gauges. Information is used for long term planning and for taking operational decisions to limit the impact of large abstractions.

2.4 Wildlife and Heritage

2.4.1 Wildlife

English Nature has divided the country into Natural Areas, comprising unique combinations of wildlife, land use, geology and culture. They link historical and cultural development of an area to its wildlife and natural features. The Natural Areas Project is an important part of the Biodiversity Action Plan and will assist in stimulating local action. The project also ties in with Countryside Character Areas (see Section 2.1 and Map 6).

In this plan the Natural Areas have been identified as the Dark Peak, White Peak, Derbyshire Peak Fringe and Lower Derwent, Coal Measures, Needwood and South Derbyshire Claylands, Trent Valley and Rises and a very small part of the Southern Magnesian Limestone.

i) Dark Peak

The Dark Peak forms part of the Peak District Moors Special Area of Protection and most of the moorland is a Site of Special Scientific (SSSI).

The Dark Peak forms the head of the Derbyshire Derwent catchment and is mainly wild open moorland. It is named after the dark millstone grit and is one of the most extensive areas of semi-natural habitats in the country, ranging from blanket bog and heather moorland, to the deep river valleys of the Noe and Ashop. There is little semi-natural woodland but many hillsides have commercial conifer plantations. These, however, could provide cover for red squirrels, goshawks and possibly pine martens. The high plateau moorlands support breeding populations of golden plover and dunlin and on the lower heath are found merlin, short eared owl and twite. The gritstone tors and edges support occasional peregrine falcon. The scrubby edges of the moorland support black grouse.

The wet pastures found away from the moors are home to curlew and lapwing and in the remainder of farming land careful management will stop the decline in species of brown hare and grey partridge. The Derwent reservoirs support common sandpiper, grey wagtail and little ringed plover.

ii) White Peak

This is a very important area being part of the Peak National Park and having numerous SSSIs. There are candidate Special Areas of Conservation (SACs) for Peak District Dales, Peak District Dales Woodland, and Gang Mine. The River Lathkill is an National Nature Reserve (NNR) and a River SSSI, one of only 27 in the country (see map 15).

It is known as the White Peak because it is a limestone plateau, intersected with steep sided dales, such as the Rivers Wye and Lathkill. Much of the original heathland is now limestone walled meadows with dew ponds, some of which hold great crested newts.

The Dales offer the most diverse habitat for fauna and flora, supporting species rich grassland with cowslip, early purple orchid, brown argus butterfly and cistus forester moths. The significant scrubland, often containing the rare dark red helleborine, grades into semi-natural ancient ash woods. The river and streams running through the dales have excellent water quality and have populations of brown trout, native crayfish, kingfishers and water vole.

There has been extensive quarrying in the White Peak and this provides nesting sites for peregrine and ravens. The spoil from lead mining in the past has given rise to metallophyte communities.

**Derbyshire Derwent
Local Environment
Agency Plan**

Map 6



**ENVIRONMENT
AGENCY**

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**Landscape - Countryside
Character Areas**

KEY

- LEAP area
- Watercourse
- Canal
- Built up area
- Southern Magnesian Limestone
- Notts, Derbys and Yorks Coalfields
- Derbyshire Peak Fringe, and Lower Derwent
- Dark Peak
- White Peak
- South West Peak
- Needwood and South Derbyshire Claylands
- Trent Valley Washlands



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40

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50

CASTLETON

TIDESWELL

BUXTON

BAKEWELL

MATLOCK

MATLOCK BATH

CLAY CROSS

SOUTH
NORMANTON
ALFRETON

WIRKSWORTH

SWANWICK

RIPLEY

BELPER

DUFFIELD

DERBY

2 Overview

iii) Derbyshire Peak Fringe and Lower Derwent

This is predominantly a pastoral area with areas of unimproved neutral and marshy grassland alongside the River Derwent and its tributaries. Many of these were dammed for industrial milling uses and the open water bodies of the rivers and reservoirs provide important habitats for great crested newts, breeding and wintering wildfowl and migrating waders. Reed bunting, kingfisher and the emerald damselfly can also be found. Ogston Reservoir provides a large gull roost and the lower reaches of streams have populations of water voles. The otter may be recolonising from the west but the status of the white clawed native crayfish is uncertain.

Grassland is abundant but traditional hay meadows, with associated rich diversity of grasses, flowers, insects and birds, have been affected by agricultural treatments.

The semi-natural woodland, mainly sessile oak, provides habitat for deadwood invertebrates, the lesser spotted woodpecker and redstart and, in some, bluebells, a globally threatened species, are found. Old trees are important for bats who use the holes and cracks for roosting. There are small areas of wet woodland, usually dominated by alder mixed with birch, ash and hazel.

There are only scattered remains of heathland, much of which has gone under the plough or become scrub or woodland through lack of grazing. Both adders and nightjar are now found only in the adjacent peak areas.

The remaining Natural Areas comprise a small part of Coal Measures around Alfreton, a similar small part of Needwood and South Derbyshire Claylands and the River Derwent at Derby and downstream which is in Trent Valley and Rises. The City of Derby covers a substantial part of these two latter areas. The Project Riverlife and Greenstep projects have ensured that there are wildlife havens along the river and within the city parks and small watercourse corridors.

2.4.2 Heritage

The Dark Peak is very rich in archaeological resource dating back to prehistoric times, with Mesolithic remains in the blanket bogs and extensive Neolithic and Bronze Age remains on the lower plateau. Old packhorse routes and small abandoned stone quarries are found, along with burial barrows on the high ground. The traditional dry stone walling and the agricultural landscape are the product of 18th century farming practices.

In the White Peak one of the greatest British prehistoric monuments is found at Arbor Low, a 4000 year old henge, and there are Roman Roads to be found. From 1650-1850 there was much lead mining in the area and not only has this left a legacy of old lead spoil heaps and charcoal burning, but also the multitude of underground soughs constructed in the limestone to drain the water (see Issue 2). The water of the Rivers Derwent and Wye was used for milling purposes and has resulted in large old mill buildings and river weirs. Sir Richard Arkwright who built several of the mills would be surprised to learn they are now being used to generate electricity through hydropower.

There are some spectacular caves in the Peak District, notably Pooles Cavern near Buxton and the Blue John and Speedwell Caverns around Castleton.

The magnificent neo classical mansions of Chatsworth and Haddon, a medieval stronghold added to in the 1600s, are the homes of the Duke of Devonshire and the Duke of Rutland respectively. Both are open to the public and are very popular with tourists. Elvaston Castle and Kedleston Hall, near Derby, are other popular attractions.

The largely disused railway network and canal infrastructure was used for transporting goods, especially quarried stone in the Matlock area. Only parts of the Cromford Canal still have water, and only remnants of the Derby Canal are visible. The Derby and Sandiacre Canal Trust are, however, looking to restore this particular waterway (see Map 17).

The Derbyshire Derwent plan area is famous for its well dressing ceremonies, which relates back to pagan times. Well dressing is the art of decorating springs and wells with pictures made of plants.

3 Issues and Options

Section three provides a detailed description of the issues that need addressing in the Agency's opinion. The issues are shown on map 7. Tables are included which set out possible options for action together with who is responsible and the benefits and constraints. Abbreviations used in the text and tables are set out below. The issues are grouped into the following three sections;

Section 1 - Site specific issues

These are issues that are key to a specific location.

Section 2 - Plan wide issues

These issues occur in a number of locations within the plan area.

Section 3 - National issues in the plan area

These issues have a national profile but important examples can be found in the Derbyshire Derwent area.

Wherever possible the individuals or organisations responsible for carrying out each option have been identified. The options are intended to facilitate improvements to the environment for the benefit of all users and are put forward for discussion and consideration. The Action Plan that leads from this report will set out an agreed set of actions with detailed budget and timetable information.

The issues have been identified by:-

- Using the knowledge of Agency staff.
- Informal consultation with a range of organisations and individuals and by taking into account representations received from key groups.
- Comparing the current state of the catchment (Section 6) with national and regional targets.

Your views and comments on the issues and options are requested, together with any new ideas and suggestions.

Abbreviations (see glossary for further details)

AMP3 - Asset Management Plan
BATNEEC - Best Available Techniques Not Entailing Excessive Costs
BCU - British Canoe Union
DETR - Department of the Environment, Transport and the Regions
DDDC - Derbyshire Dales District Council
DWT - Derbyshire Wildlife Trust
EN - English Nature
FRCA - Farming and Rural Conservation Agency
FWAG - Farming and Wildlife Advisory Group
LA - Local Authority
MPA - Mineral Planning Authority
MAFF - Ministry of Agriculture, Fisheries and Food
MoU - Memorandum of Understanding
NFU - National Farmers Union
OFWAT - Office of Water Services
PDNPA - Peak District National Park Authority
RO - Riparian Owner
RSPB - Royal Society for the Protection of Birds
SAC - Special Area for Conservation
SPA - Special Protection Areas
STW - Severn Trent Water Ltd
STP - Sewage Treatment Plant

**Derbyshire Derwent
Local Environment
Agency Plan**

Map 7



**ENVIRONMENT
AGENCY**

0 10km



PLAN WIDE ISSUES

8, 9, 10, 11, 12, 13, 14, 15, 16, 17

**NATIONAL ISSUES IN THE
PLAN AREA**

18, 19, 20, 21, 22, 23, 24, 25



Issue Locations

KEY

- LEAP area
- Watercourse
- Canal
- Built up area
- Issue location
- Issue river stretch
- Issue area
(Carboniferous Limestone)

3 Issues and Options

3.1 The Derbyshire Derwent Issues

The issues are separated into three sections. There is no priority order to the sections or the issues within each section.

3.2 Site specific issues

- Issue 1 The deterioration of Calver Weir
- Issue 2 Historic mine workings have affected flows in the River Lathkill
- Issue 3 The detrimental impact on water quality from wrong sewerage connections in Derby
- Issue 4 Problems of maintaining current water quality levels in the Lower Derwent
- Issue 5 Obstructions and water quality in the River Amber limit fish distribution
- Issue 6 Negative impact on natural brown trout populations in the Rivers Ashop and Noe caused by the operation of abstractions associated with Derwent Valley reservoirs

3.3 Plan wide issues

- Issue 7 Discharges to Underground Strata in the Carboniferous Limestone of Derbyshire
- Issue 8 Pollution of the water environment by new types of sheep dip chemical
- Issue 9 The lack of availability of future landfill space
- Issue 10 The threat to water quality posed by closed landfill sites
- Issue 11 Possible pollution effects from the spreading of waste on land



Photograph 3 - Calver Weir (Issue 1)

3 Issues and Options



Photograph 4 - Giant Hogweed (Issue 13)

- | | |
|----------|--------------------------------------------------------------------------------------------------|
| Issue 12 | Fly-tipping of domestic waste |
| Issue 13 | Loss of natural habitat to invasive plant species |
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3.4 National issues in the plan area

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|----------|-------------------------------------------------------------------------------------------------------------------|
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| Issue 21 | Damage to the water environment and derogation caused by the operation of hydropower sites |
| Issue 22 | Problems of utilising land identified as contaminated land |
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| Issue 25 | The inability to provide scientific interpretation due to the lack of air quality data |

3 Issues and Options

3.2 Site Specific Issues

Issue 1 The deterioration of Calver Weir

Objective - Prevent Calver Weir from collapsing

Calver Weir is a large imposing structure on the upper reaches of the River Derwent. Over the last few years the condition of the weir has considerably deteriorated and the Agency and local residents are concerned about the structural condition of the weir. The significance of the weir is increased by the fact that it is a listed structure.

The owners are unable to effect repairs and there is a concern that the structure may collapse causing the following problems:-

- i) a significant amount of silt to be carried onto the river bed downstream
- ii) a drop in water levels that could have an effect on the willow/alder carr on the upstream bank.

The angling club who fish upstream are investigating the possibility of a lottery bid to repair the weir. Peak District National Park Authority are also keen to encourage repairs to the weir.

ISSUE 1 : The deterioration of Calver Weir			
Options for action	Responsibilities	Benefits	Constraints
1.1 Assist in the preparation of a lottery bid	PDNPA/RO/Parish Council/Environment Agency	Provide funds to undertake remedial works to weir	Suitability of the bid and limit of the funds
1.2 Assess the present structural condition of the weir	Riparian Owner/ Environment Agency	Increase knowledge of weir stability	Cost
1.3 Assess potential damage to the environment in the case of a collapse	Environment Agency/ RO/PDNPA	Increase knowledge of situation	Cost
1.4 Examine the potential for additional funding	DDDC/ Environment Agency	Prevent collapse of structure	Limit of funds
1.5 Do nothing			Potential weir collapse and possible environmental problems

Issue 2 Historic mine workings have affected flows in the River Lathkill

Objective - understand hydrological and hydrogeological factors affecting flows

The River Lathkill has experienced extreme low flows, and on some reaches no flow at all.

The area around Lathkill Dale was once a centre for lead mining. To improve the mining conditions, between the years 1600 and 1900, drainage soughs were constructed to suppress the natural water table level. These soughs also affected the natural groundwater flows. Some of the drainage that would normally reach the River

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Lathkill is in effect being diverted into the soughs and discharged directly to the Rivers Wye and Derwent further downstream. It is felt these soughs are a probable cause for the loss of flow, which is currently compounded by the driest months on record.

The lower parts of the river are managed as a fishery by local landowners, Haddon Estates. There is concern that the fishery is suffering due to the lack of flow.

The River Lathkill is a river SSSI identified by English Nature. The river SSSI is part of the larger Lathkill Dale SSSI, which is part of the candidate Derbyshire Dales Special Area for Conservation (SAC). This will be designated under the Habitats Directive for its importance for native crayfish. The Agency and English Nature are required under a Memorandum of Understanding (MoU) to draw up conservation objectives and a consenting protocol for the SSSI, and to review Agency consents that may affect the SAC.

ISSUE 2 : Historic mine workings have affected flows in the River Lathkill			
Options for action	Responsibilities	Benefits	Constraints
2.1 Review existing hydrogeological, hydrological and ecological information	Environment Agency	Quantify problem Identify areas for further work	Cost Resources
2.2 Study hydrogeology of aquifer affecting River Lathkill catchment	Environment Agency	Identify solutions	Cost Resources
2.3 Prepare a consenting protocol for the River Lathkill SSSI	Environment Agency/ EN	Identify areas for further work	
2.4 Review by 1999 consents affecting SACs and Special Protection Areas (SPAs)	Environment Agency/ EN	Understanding of Agency effects in the catchment	Resources
2.5 Survey the area for the presence of native crayfish	EN/Environment Agency	Knowledge of crayfish presence	Cost Human Resources
2.6 Investigate passages to fish migration pending results of survey	Environment Agency/ Riparian Owners	Promotion of spawning migration	Cost

Issue 3 The detrimental impact on water quality from wrong sewerage connections in Derby

Objective - stop wrong sewerage connections through better education and public awareness

Within the area of Derby City there is a common problem of wrong sewerage connections. Most of the problems identified concern washing machines, dishwashers or hand basins being connected into the surface water system rather than the foul sewerage system. There are even situations where gross solids have been identified in the surface water system. The majority of these problems manifest themselves in minor urban watercourses close to residential areas.

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Investigation of wrong connections is an issue that requires considerable resources to tackle successfully, and often the more complex problems are time consuming. Historically the Agency and the Environmental Health Department of Derby City Council have followed up public complaints, using powers to serve notice under Section 34 of the Public Health Act 1936. Further legislation that is available to Local Authorities to tackle this problem is the Building Act 1984, Section 59, which requires the owner of a property to make satisfactory provision for the drainage of a building.

Water companies have the ability to prosecute under the Water Industries Act 1991, Section 106(2), and it is proposed to reach an agreement with Severn Trent Water Ltd. The company will undertake the initial survey to identify the source of the problem and hand this information onto the Environmental Health Department. It is hoped that this will be an improvement upon the existing situation.

ISSUE 3 : The detrimental impact on water quality from wrong sewerage connections in Derby			
Options for action	Responsibilities	Benefits	Constraints
3.1 Develop a prevention and education strategy and continue liaising with interested parties	Environment Agency/ Severn Trent Water Ltd/ Derby City Council	Reduction of cross connections through increased public awareness Improved water quality	Costs

Issue 4 Problems of maintaining current water quality levels in the Lower Derwent

Objective - reduce eutrophic conditions and create a better understanding of the complex nature of the Lower Derwent from all interested parties

The Lower Derwent receives large quantities of treated sewage and industrial effluents. The water quality immediately downstream from these is satisfactory. The unsatisfactory reach is downstream from the Southern Surface Water System (SSWS) which drains the southern part of Derby. This receives intermittent dry weather discharges from the foul sewerage system.

Levels of orthophosphate (an important plant nutrient) are high within parts of the River Derwent. This means that the river supports dense beds of aquatic plants downstream of Derby. Botanical surveys have shown a vegetation typical of eutrophic conditions. Eutrophication is the excess growth of aquatic vegetation due to increased plant nutrients being introduced to the watercourse. Concentrations of dissolved oxygen in the lower reaches of the river show wide diurnal fluctuations which are influenced strongly by plant photosynthesis and respiration.

The Agency carries out periodic assessments of candidate waters for designation as Sensitive Areas (Eutrophic) (SA(E)) under the Urban Wastewater Treatment Directive (UWWTD). The River Derwent downstream of Derby is currently being assessed as a candidate SA(E) using data collected during the last UWWTD review period (1994-96), and other parts of the catchment may be considered during the next review in 1998-2000.

The Lower Derwent is a high quality coarse fishery, due in part to the high organic contribution from the above upstream sources. This fishery is however in balance because of the complex factors at work in the Lower Derwent. Courtaulds abstract water from the River Derwent necessary for cooling purposes, and the amount of water abstracted may increase depending upon the ambient temperature. The resulting higher volume of warmer water that is returned to the river effects pH levels. Levels of unionised ammonia increase as a result, creating a situation harmful to fish. This balance can be further upset by a discharge from the storm water outfalls which operate after a period of heavy rainfall over Derby. The discharge in effect creates a flash pollution. Additionally the size of the fish is affected by aquatic vegetation growth associated with eutrophication.

A better understanding of the complexity of the quality of the Lower Derwent is required, as well as a better

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understanding between the various companies and angling clubs using the river for industrial and recreational purposes.

It is recognised that the water quality of certain reaches of the Lower Derwent is not sustainable without further investment and plans for sewerage works improvements are presently being formulated.

ISSUE 4 : Problems of maintaining current water quality levels in the Lower Derwent			
Options for action	Responsibilities	Benefits	Constraints
4.1 Create a management plan for the Lower Derwent	Environment Agency	A better public awareness and understanding of the problems	Cost
4.2 Complete assessment of candidate SA(E) downstream of Derby STP following 1994-96 Review	Environment Agency/ DETR	Planned programme of priorities	Cost
4.3 Carry out further monitoring during next review period (1998-2000) including impacts of qualifying discharges upstream of Derby	Environment Agency	Identify contribution of qualifying discharges other than Derby STP and other contributions to eutrophication	Cost
4.4 Removal of nutrients to prevent eutrophication	Severn Trent Water Ltd	Reduce eutrophication and impacts on fishery and flood defence uses of river	Cost/benefit Low nutrient levels require high capital and revenue costs of extra treatment plant

Issue 5 Obstructions and water quality in the River Amber limit fish distribution

Objective - improve the fisheries potential of this stretch of watercourse

Upstream of its confluence with Alfreton Brook at Toad Hole Furnace, the River Amber is a trout stream with a self sustaining population. Downstream of the Alfreton Brook confluence however a combination of old mill weirs and fluctuating water quality has a detrimental effect on fish distribution.

The old mill weir structures create an obstruction to the migration of brown trout and coarse fish. There is also a problem of siltation associated with these structures which results in a lack of spawning habitat.

The Alfreton Brook catchment is predominantly urbanised and as such the watercourse contains high proportions of treated sewage, urban runoff and industrial effluents. There are also major inputs from mine water to the watercourse, which provides a valuable source of low BoD (Biological Oxygen Demand) dilution water, but also gives rise to increases in both ochrous and saline concentrations. The problem is further exacerbated by occasional high levels of ammoniacal nitrogen in this stretch of the River Amber. This combination of factors can produce an environment which puts pressure on the maintenance of a fish population.

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ISSUE 5 : Obstructions and water quality in the River Amber limit fish distribution			
Options for actions	Responsibilities	Benefits	Constraints
5.1 Review the operation of mill weirs	Environment Agency/ Riparian Owner	Possible installation of fish passes and improved operation of sluices	Cost of fish passes and fish for restocking
5.2 Test stability of water quality and habitat using marked fish as pioneer stock	Environment Agency	Possible re-establishment of self sustaining fish stocks	Cost of restocking

Issue 6 **Negative impact on natural brown trout populations in the Rivers Ashop and Noe caused by operation of abstractions associated with Derwent Valley reservoirs**

Objective - alteration in the water release regime from Ladybower Reservoir

As part of the Derwent Valley reservoir system, water is abstracted from the River Noe at Edale and from the Rivers Alport and Ashop at their confluence. To compensate for the abstraction of the whole flow in the River Noe, 17ML/d is discharged into Jaggars Clough. There is no compensation release into the River Ashop despite a similar abstraction of the whole flow.

The result of these abstractions is a dry river bed in both cases. In the River Noe the dry stretch is approximately 2km in length, in the Ashop it is in the region of 3km.

The Agency is concerned about the reduced numbers of brown trout in the headwaters of the River Derwent and its tributaries in the north of the plan area. The natural brown trout population in the upper reaches of the Rivers Noe, Ashop and Derwent suffer from the low flows associated with the operation of the Ladybower Reservoir system.

A different regime of water release and/or impoundment could allow the fish population to spread and become more secure. For example, dividing the compensation release between Jagger's Clough and the River Noe itself will result in constant flow in the river. The construction of fish passes will also aid the fishery.

ISSUE 6 : Negative impact on natural brown trout populations in the Rivers Ashop and Noe caused by operation of abstractions associated with Derwent Valley reservoirs			
Options for action	Responsibilities	Benefits	Constraints
6.1 Review operating arrangements for both sites	Environment Agency/ Severn Trent Water Ltd	Establish options for improvements	Operating procedures of Severn Trent Water Ltd and any associated costs.
6.2 Request the changes on the River Noe are progressed through the Asset Management Plan 3 (AMP3) process	Environment Agency/ Severn Trent Water Ltd	Attain commitment to improvements by Severn Trent Water Ltd	Priorities in AMP3 process

3 Issues and Options

ISSUE 6 continued			
6.3 Vary abstraction licences to authorise changes	Severn Trent Water Ltd/ Environment Agency	Provide flow for a greater proportion of the year	Cost of altering compensation arrangements
6.4 Install fish passes on Edale and Ashop weirs	Severn Trent Water Ltd/ Environment Agency	Allow migration of trout populations	Cost of installing passes

3.3 Plan Wide Issues

Issue 7 Discharges to underground strata in the Carboniferous Limestone of Derbyshire

Objective - protection of the limestone major aquifer from sewage effluent discharge

Unrestricted discharge of sewage effluents directly to the Carboniferous Limestone presents potential water quality problems and public health hazards. The lack of surface watercourses in the limestone area means that a number of sewage effluent discharges have to be made to underground strata.

It is essential that discharges into limestone, particularly via shafts, fissures or shacks, are of an acceptable quality. There are several STPs that discharge effluent in this manner, and this must be adequately controlled. There is a need for a policy to ensure that consistent standards are applied to all discharges across the limestone area, both large and small and to assist with prioritising for AMP3 spending by the water company.

The Carboniferous Limestone is classified as a Major Aquifer. This means that within the rock formation significant quantities of high quality water are stored. The high quality of this groundwater means that it is a valuable source of drinking water when abstracted from the rock. There are several significant and a multitude of small abstractions dependent upon this source of groundwater which must be protected. However the Major Aquifer is highly vulnerable to pollution. Contamination of groundwater can also affect surface water due to rapid groundwater flows and the hydraulic connection with surface waters.

Additionally, many of the underground systems have SSSI status and subsequently discharge into rivers of a similar status.

Many areas of the limestone have extensive cave systems. These may be show caves, as found in the Castleton area or other cave/lead mine systems used by cavers. Such discharges may present a health hazard to cavers. In fact in the Knotlow Mine system, cavers have reported pollution downstream of Flagg STP.

ISSUE 7 : Discharges to underground strata in the Carboniferous Limestone of Derbyshire			
Options for action	Responsibilities	Benefits	Constraints
7.1 Monitor and enforce consent standards on existing discharges	Environment Agency	Maintain/improve water quality and safeguard public health	Cost Lack of information
7.2 Identify underground discharge route/assess risks	Environment Agency/ Severn Trent Water Ltd/ Other dischargers where appropriate	Obtain information for reasonable cost/benefit analysis on investment options	Sometimes technical difficulties in producing conclusive data

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ISSUE 7 continued			
7.3 Review appropriate standards for new and existing consents and infrastructure investment options in view of above	Environment Agency/ Severn Trent Water Ltd/ Other dischargers where appropriate	Improve water quality and eliminate potential future health hazards	Money may not be available for improving existing discharges via AMP3

Issue 8 Pollution of the water environment by new types of sheep dip chemical

Objective - increase awareness of the effects of sheep dip to the aquatic environment

Biological monitoring of parts of the Peakshole Water catchment has shown recent examples of serious toxic pollution with severe damage to invertebrate communities. This has been traced to contamination of an underground tributary of Peakshole Water by sheep dip chemicals, including synthetic pyrethroids.

This particular pollution problem is being addressed, but the wider issue of sheep-dip use and disposal within the catchment needs to be considered. Farmers are switching to the newer pyrethroid-based dips following concerns about the health hazards of traditional organophosphate-based products. This has resulted in an understandable perception that the new dips are "safer". However pyrethroid-based dips are highly toxic to aquatic life and can destroy it along large stretches of watercourses. The newer dips have been associated with a large increase in water pollution nationally.

ISSUE 8 : Pollution of the water environment by new types of sheep dip chemical			
Options for action	Responsibilities	Benefits	Constraints
8.1 Maintain routine biological surveillance of watercourses at risk from sheep dip disposal	Environment Agency	Rapid detection of pollution allowing effective targeting of resources to minimise impact	Cost
8.2 Publicise environmental risks associated with sheep dip use and disposal, with special targeting of information to sheep farmers and sheep farming areas	Environment Agency	Reduced environmental pollution	Cost
8.3 Continue to undertake farm visits to survey sheep dip facilities to carry out risk assessment	Environment Agency	Prevent environmental pollution	Cost

3 Issues and Options

Issue 9 **The lack of availability of future landfill space.**

Objective - consider the needs and alternatives to landfill

In the north and west of the plan area there is a problem in disposing of waste due to the presence of the Carboniferous Limestone Major Aquifer. As discussed in Issue 7 the Major Aquifer is an important supply of high quality water and is vulnerable to pollution. As a result the Agency has a policy of not allowing the development of landfills for domestic, commercial or industrial waste that would affect the Major Aquifer. This restricts any future landfill development.

There are some old waste disposal sites in the north of the plan area. One such site is the subject of a current Waste Management Licence Application to allow a small volume of additional waste disposal in a lined area to enable this site to be restored to an acceptable standard. Negotiations are ongoing with the operator to ensure the highest standards of engineering and operation for the small additional waste input.

The geology appears more favourable elsewhere in the plan area for the creation of landfills, but there are no current proposals being considered by the Agency. In these areas, however, high standards of environmental controls may still make a certain number of these sites unsuitable for development.

ISSUE 9 : The lack of availability of future landfill space			
Options for action	Responsibility	Benefits	Constraints
9.1 Examine the need for landfill void.	Environment Agency/ Local Authorities	Sharing of expertise Promote more sustainable waste management operations Promote best practice	Current lack of common strategic approach Lack of clear information
9.2 Examine and promote alternatives to landfill	Environment Agency/ Local Authorities	Sharing of expertise Promote more sustainable waste management options Promote best practice	Lack of accurate data Lack of common strategy Current lack of local alternatives

Issue 10 **The threat to water quality posed by closed landfill sites**

Objective - limit the environmental risk from rising leachate levels

Closed landfills, if not managed properly, can pose a threat to the quality of both groundwater and surface water. Within the plan area two such examples can be found, at Buxton and Crich. These former domestic waste landfills were closed before the need for a certificate of surrender. One of the main problems is that many of the older landfill sites were not prepared or engineered to today's standards.

The aftercare of these sites is only controlled by the occasional removal of leachate by the operator. Both sites have several metres depth of leachate which could pollute. In one case this could affect a lake used for diving, and in the other case a drainage sough discharging to a watercourse.

There is a need for a more formal and regular control of the leachate to ensure that pollution does not occur. The present spasmodic arrangements cannot be controlled in any way by the Agency but officers have serious concerns regarding the long term future of these sites. It is hoped that negotiations with the site operators will lead to more formal control with a commitment to action, monitoring and remedial action as necessary.

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ISSUE 10 : The threat to water quality posed by closed landfill sites			
Options for action	Responsibilities	Benefits	Constraints
10.1 Liaise with the site owners/former operators to ensure extent and nature of problem is fully quantified.	Environment Agency with site owner/ former operator	The volume and depth of leachate is determined and risk can be quantified	No legal requirement on the owner/former operator to undertake the work
10.2 Ensure the appropriate actions are undertaken by the owners/former operators to reduce the risk to the environment from these sites	Environment Agency with site owner/ former operator	Risk is minimised and actions taken to remove leachate or other appropriate action taken	Costs Human Resources Lack of legal requirement to insist work is carried out at present.

Issue 11 Possible pollution effects from the spreading of waste on land

Objective - examine the necessity for the scale of waste spreading and techniques to restrict potential polluting wastes

The spreading of waste on land for agricultural purposes is common within the plan area. The Agency is concerned about the scale of such operations.

Traditional agricultural manure spreading is exempt from licensing. However, some waste spreading activities can cause pollution.

Flagg, in the north of the area has been subject to large scale spreading operations involving waste from animal processing sources outside the County. This activity is felt by the Agency to fall outside the exemption and should be licensable, because of the potential pollution this may cause. This view, however, was successfully challenged, legally, by the waste spreading operators. The Agency at a local level feels this is an important issue that needs re-examining.

ISSUE 11 : Possible pollution effects from the spreading of waste on land			
Options for action	Responsibility	Benefits	Constraints
11.1 Re-examine the implications of the legal decision concerning Flagg	Environment Agency	Obtain definitive internal view on the acceptability of such a waste activity	Current lack of common strategic approach
11.2 Consider ways to raise profile of pollution prevention as a practicable option	Environment Agency	Reduction in the potential for harm to human health, pollution of the environment and detriment to the local environment	No current common strategy Limited resources

3 Issues and Options

ISSUE 11 continued			
11.3 Increased inspection of such activities	Environment Agency	Increase Agency profile Greater control and awareness of realtime activities and issues	Resources

Issue 12 Fly-tipping of domestic waste

Objective - investigate the need and potential for different waste disposal services

There is a recognised problem of fly-tipping of domestic waste within the plan area. **One** of the causes of fly-tipping is the lack of provision of Civic Amenity sites. Section 50 of the Environmental Protection Act 1990 places a responsibility on the County Council Waste Disposal Authority to arrange for **the** provision of places at which residents may deposit their household waste free of charge. These facilities are **commonly** known as Civic Amenity sites.

The coverage of such facilities within the Derbyshire Derwent plan area is limited, with **only** one facility located within the area, in the City of Derby. There are other Civic Amenity sites within **Derbyshire**, but all of these fall outside the plan area.

The relevant District Council may also provide small scale recycling facilities, **this situation** does not promote the principles of sustainability for the residents of areas such as Buxton, Bakewell and **Matlock**, in that they have to travel significant distances to dispose of bulky household wastes.

Some District Councils also offer a bulky household waste collection service, whereby waste is collected on the doorstep. In some areas there is a charge for this service.

ISSUE 12 : Fly-tipping of domestic waste			
Options for action	Responsibility	Benefits	Constraints
12.1 Investigate the need for and promote the potential of civic amenity sites.	Environment Agency/ Local Authorities	Sharing of expertise Promote more sustainable waste management operations Promote best practice Reduce illegal fly-tipping activities	Current lack of strategic approach Lack of common data Lack of resources (financial and logistical)
12.2 Promote household collection services	Local Authorities	Reduction in fly-tipping	Cost

Issue 13 Loss of natural habitat to invasive plant species

Objective - control and eradicate where possible invasive plant species

There is a large patch of Giant Hogweed growing in the old dry Lumford Mill pond **upstream** of Bakewell on the River Wye. There are also plants on the banks of the river. The plant is becoming a nuisance to adjacent landowners and could become a health hazard in Bakewell. The plant is able to grow in excess of 4.5m high and when touched will cause blisters on skin exposed to sunlight. It is an offence under the Wildlife and Countryside Act (WCA) 1981 to cause this plant to grow. Immediate action is required to prevent **further** spread of this invasive poisonous plant.

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Apart from Giant Hogweed, the Agency also recognises Himalayan Balsam and Japanese Knotweed as invasive plants. These plants grow very densely and shade out native plants as well as being poor habitats for fauna. They devalue the natural landscape and increase the risk of river bank erosion when they die back in autumn. To allow these plants to grow is also an offence under the same legislation.

The Agency will, in conjunction with other agencies, seek to prepare a strategy for the control of alien invasive plants along Main Rivers in the plan area and to implement this strategy on the River Wye near Bakewell.

A survey of Japanese Knotweed has been undertaken for the River Derwent. With the assistance of riparian landowners, this will form the basis for a strategy to control and eradicate this plant wherever possible.

ISSUE 13 : Loss of natural habitat to invasive plant species			
Options for action	Responsibilities	Benefits	Constraints
13.1 Determine a programme of control for Giant Hogweed and Japanese Knotweed	Environment Agency/ PDNPA/Riparian Owner/LA	Restoration of native flora	Cost
13.2 Advise riparian owners on control of all alien invasive plant species	Environment Agency	Improve education	None

Issue 14 The use of helicopters to spray herbicides may affect water quality in potable supply catchments

Objective - limit the use of helicopters to apply asulox herbicides

Recent trials have indicated that the EC Drinking Water Directive's mandatory limit of 0.1 µg/litre for pesticides in potable supplies (drinking water) may be exceeded when helicopters are used to spray asulox herbicide onto bracken in upland areas.

Asulox is a herbicide used to control the invasive nature of bracken in moorland areas. It is particularly effective on the control of ferns and is accepted to have a low toxicity for mammals. Whilst the Agency does have authorisation procedures to control the use of herbicides near to watercourses, the Derbyshire Derwent area is considered to be particularly sensitive as it is a potable supply catchment. During the course of a year helicopters may be used up to 5 times in the plan area to control bracken.

Bracken spreads continually and is highly competitive and successful being completely disease resistant. Bracken is a serious threat to heather moor and heathland which it stifles completely. It is unsuitable to ground-nesting birds and most other fauna, suppresses tree growth, and because of its array of poisonous chemical defences poses a health risk to humans and animals. Bracken beds lie in the catchments of both of the major Derwent reservoirs and the numerous small potable sources.

Asulox is not the only method that can be employed to control bracken, there are several others which include:-

Pigs - the use of pigs to remove bracken from an enclosed area is highly effective. The pigs seek out the carbohydrate rich rhizomes. However pigs will destroy most other vegetation on site and must be securely fenced and provided with shelter.

Tillage - the rhizomes can be broken down or frost damaged if brought to the surface through tillage, but only on suitable level stone free ground.

3 Issues and Options

Cutting and crushing - this is a process undertaken over a number of years to gradually deplete the rhizome system but cannot take place if ground nesting birds are at risk. New types of crushers are however presently being developed that are more sensitive to the surrounding environment and suitable for rough terrain.

ISSUE 14 : The use of helicopters to spray herbicides may affect water quality in potable supply catchments			
Options for action	Responsibilities	Benefits	Constraints
14.1 Monitor and enforce existing Agency policy on herbicide applications	Environment Agency	Protect water quality and safeguard public health	Cost Paucity of information on which to determine applications
14.2 Fund Research and Development project	Environment Agency	Provide review of available information on which to base Agency policy and individual decisions	Poor legal framework Cost
14.3 Redefine Agency policy in light of above	Environment Agency	Produce scientifically based policy understandable by manufacturers, users and public	Cost
14.4 Develop methodology of application alternative to helicopters	Herbicide manufacturers and users	Further protect water quality and safeguard public health. Minimise usage and waste. Long term cost saving	Cost
14.5 Use of alternative bracken control methods	Riparian owners	Prevents risk to water quality	The cost and effectiveness of the alternatives compared to asulox

Issue 15 Promotion of recreational access along river valleys

Objective - to develop a strategy for access to watercourses that is sensitive to the environment

The plan area contains many river valleys which are extensively used by tourists and recreational users. A trust has been formed, with representation from the Agency, to encourage the development of a tourism strategy for the Derwent Corridor. The Agency has also supported the formation of an interpretive centre at Belper and picnic tables beside the River Derwent at Belper. The Agency will continue to support such initiatives.

Whilst promotion of recreational access is one consideration, it should also be taken into account that there are sensitive areas in terms of habitat that should not be disturbed, and also the rights of the riparian owner. There are also areas within the plan area where the sheer volume of tourists creates traffic congestion during peak periods, and further promotion of recreational access may be detrimental.

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ISSUE 15 : Promotion of recreational access along river valleys			
Options for action	Responsibilities	Benefits	Constraints
15.1 Continue to support current initiatives such as Derwent Valley Heritage Trust	Local Authorities/ Environment Agency	Improvement of existing facilities	Cost
15.2 Work in partnership with Local Authorities and other bodies to improve facilities and access.	Local Authorities/ Riparian Owners/ Environment Agency	As above	Cost Human Resources
15.3 Work with the BCU to restore the canoe slalom course at Matlock	British Canoe Union/ Riparian Owners/ Environment Agency	Improved facilities	Cost Human Resources
15.4 Ensure that any proposed new access does not impact on sensitive habitat or species.	Environment Agency/ Local Authorities/ English Nature	Protection of existing habitat	None

Issue 16 The rich archaeological and historical resource of the Derwent Valley requires protection

Objective - protect archaeological and historical resources from development pressures

In the reaches of the Lower Derwent close to its confluence with the River Trent there is a unique archaeological resource. The Agency is concerned that this resource is at risk from gravel extractions in the Lower Derwent Valley.

The Upper Derwent Valley is rich in archaeological remains and surveys have recently been undertaken and funded by Severn Trent Water Ltd and Peak National Park. The tributaries of the Derwent, as well as the main river, have provided water for a large number of mills. It must be ensured that these resources are protected from water resources schemes, and quarrying activity in particular. Other resources must be protected by good management, for example, the Pennine Way is also a Roman road on part of its course. The Pennine Way is a popular walk and the sheer number of visitors creates a pressure to the route through erosion.

ISSUE 16 : The rich archaeological and historical resource of the Derwent Valley requires protection			
Options for actions	Responsibilities	Benefits	Constraints
16.1 Prepare an archaeological strategy for the Lower Derwent	LA/Environment Agency/MPA/RO	Protection of archaeological and historical resource	Cost

3 Issues and Options

Issue 17 Disparity between abstraction licensing policies for surface water and groundwater

Objective - to develop an integrated surface and groundwater licensing policy which recognises the development of future small abstractions

There is growing pressure on the water resources in the River Derwent catchment. Surface water licensing policy takes into account Severn Trent Water Ltd's public water supply (PWS) licences and support of river flows for PWS and environmental purposes. Groundwater licences for the Carboniferous Limestone and Gritstone aquifers may be granted, subject to no adverse environmental impact, but each abstraction potentially reduces baseflows in the River Derwent and so derogates the PWS licences. There is therefore a need to develop an integrated surface and groundwater licensing policy, so that some resource development is possible in future for small abstractions.

ISSUE 17 : Disparity between abstraction licensing policies for surface water and groundwater			
Options for action	Responsibilities	Benefits	Constraints
17.1 Review existing licensing policies	Environment Agency	Achieve consistent policies	Lack of hydrological and hydrogeological information
17.2 Negotiate with existing major licence holders to allow small licences without derogation claims	Environment Agency/ Severn Trent Water Ltd/ Hydropower site operators	Allow flexibility for small licences	Willingness of operators to negotiate

3.4 National Issues in the plan area

Issue 18 Biodiversity protection

Objective - to protect and improve where possible the variety of life

The signing of the Biodiversity Convention by the UK Government at the Earth Summit in 1992 has given a high profile to biodiversity protection. As mentioned in Section 1.4, biodiversity is the variety of life, encompassing all the forms of life which constitute the living world. The term includes humans and their relationship with the rest of the environment. Many species are at risk as a direct result of human activity.

A National Biodiversity Action Plan (BAP) has been produced and there are many county initiatives. Three BAPs are being produced for Derbyshire - the Peak District, The National Forest and the Mid Derbyshire. These BAPs have been produced by Derbyshire Wildlife Trust, in conjunction with others, for Derbyshire. As mentioned in section 1.4 the Midlands Region of the Environment Agency has produced its own biodiversity strategy.

Maintaining biodiversity will need attention to all species and habitats although limited resources require that priorities will have to be set. National and local BAPs are therefore focusing initially on those habitats and species most at risk.

The following are key species and habitats for which the Agency has a special interest and responsibility. All of these key species have protection under legislation. The Agency understands that there are many other endangered species and habitats, but has focused on areas where its influence is greatest.

3 Issues and Options

1. MAMMALS

Otters

The otter is a globally threatened species and became virtually extinct in the area in the 1950s. There have been occasional sightings in 1980s and 1990s in the plan area. These sightings would be otters visiting sites in the plan area from the west where populations of otters are better established.

Water Voles

The water vole has suffered a rapid decline in the UK. Reasons may include poor water quality, loss of habitat and an increase in the numbers of its predators.

Bats

Bats hibernating and roost sites must be protected from any development or maintenance work. Daubentons Bats, particularly, feed over water, and are of particular interest to the Agency.

2. CRAYFISH

The Atlantic Stream Crayfish is the only crayfish native to the UK. They were once widespread in the River Wye and Upper Derwent part of the plan area but there was a population collapse a few years ago which decimated crayfish numbers. The problem occurred in the River Wye and Upper Derwent catchments. The cause of the collapse was unknown but it could have been through crayfish plague, a fungal infection that can be passed from Signal Crayfish, a North American species. A better understanding of their distribution, ecology and management is required.

3. DERBYSHIRE FEATHER MOSS

Derbyshire Feather Moss is an extremely rare plant identified at only one site in the world, at Cressbrook Dale. The site must be safeguarded and ecological research should be undertaken to ensure effective conservation management and prevent atmospheric pollution

4. BIRDS

Birds associated with water such as dippers, common sandpiper and sand martin are at risk through disturbance or loss of habitat.

5. BROOK LAMPREY

The brook lamprey is a nationally rare species found locally in the plan area. The adults require gravel for spawning and the juveniles live in fine silts and sand. The Agency recognises that the habitat of this species requires protection where the species is present, but at the same time very little is understood about the brook lamprey and further understanding is essential.

6. HABITATS

Wetlands

Wetlands have declined over the last few decades and there is a need to protect, restore and create open water habitat, grazing marsh, fen and reed bed habitat and to recreate natural water regimes in valley bottoms.

Grasslands

There has been a serious decline in wet grassland habitat through drainage causing a lowering of the water table.

Upper Moorlands (Blanket Bog, Heathland and grassland)

The Dark and White Peak areas were once extensive heath and moorlands. There has been degradation of the blanket bog on the Dark Peak through drying out and a loss of heathland elsewhere. Land management practices and the use of the land as a water resource catchment have contributed to the loss of habitat in this area. The heathland is an important habitat for a range of plants, invertebrates and birds. There is a need to restore, extend and link heathland by using species re-introduction, where appropriate, and natural processes.

Woodland

Peak District Dale Woodlands is a candidate SAC, comprising Cressbrook Dale, Lathkill Dale, Matlock Woods and Via Gellia Woodlands. These are mixed woodlands on alkaline soils associated with rocky slopes, and these dales are considered to be one of the best areas in the UK. The National Forest area is found in the south of the

3 Issues and Options

plan area, the major part of the new forest being outside the area. Wet woodland is a declining habitat and the disease Phytophthora is affecting alders along the Derwent and Amber valleys.

ISSUE 18 : Biodiversity protection			
Options for action	Responsibilities	Benefits	Constraints
Otters 18.1.1 Survey main rivers for otter presence	Environment Agency/ EN	Increased knowledge	Cost
18.1.2 Construct artificial otter holts	Environment Agency/ Riparian Owner/ DWT	Habitat improvement	Approval of riparian owner
18.1.3 Encourage the use of buffer zones and Agri-Environment grants to secure appropriate management of river corridor	MAFF/FWAG/ FRCA/Environment Agency	Habitat improvement	Limit of MAFF funding
18.1.4 Undertake river strategies to target resources and assess maintenance practices, quality requirements and food availability	Environment Agency	Establish a baseline for river enhancement	Human resources
Water Voles 18.1.5 Survey main river to assess remaining populations	Environment Agency/ DWT	Increased knowledge	Cost
18.1.6 Promote appropriate management of riparian habitat	Environment Agency/ DWT	Protection of habitat	Approval of riparian owner
Bats 18.1.7 Provide information to developers and Local Authorities on protection of bat habitat	Environment Agency	Increased education and protection of habitat	None
18.1.8 Provide information on bat boxes.	Environment Agency	as above	None
Crayfish 18.2.1 Ensure appropriate habitat management is undertaken on watercourses where native crayfish are present.	Environment Agency/ Riparian Owner	Retain and preserve known populations	Human resources
18.2.2 Investigate potential for recovery of native crayfish in areas where the population has declined.	Environment Agency/ EN/Riparian Owner	Assist recovery	Cost
18.2.3 Protect sites where crayfish are present and prevent damage from development	LA/Environment Agency	Habitat protection and improved education	Human resources
Derbyshire feather moss 18.3.1 Undertake ecological research	EN/Environment Agency	Protection of a very rare species	None

3 Issues and Options

ISSUE 18 continued			
Birds			
18.4.1 Advise recreational users regarding disturbance to breeding birds.	DWT/LA/PDNPA/RO Environment Agency	Improved education and protection of habitat	None
18.4.2 Investigate creation of habitat in river corridor.	Environment Agency/ DWT/EN	Promotion of new habitat	Cost
Brook lamprey			
18.5.1 Protect areas where brook lamprey are found	Environment Agency/ Riparian Owner	Protection of a rare species	Change of management practices
18.5.2 Support research programmes into brook lamprey	Environment Agency	Increase understanding	Cost
Wetlands			
18.6.1 Investigate the loss of wetlands in the plan area	Environment Agency/ DWT/LA	Increase knowledge and understanding	Cost
18.6.2 Encourage the creation of new wetlands	Environment Agency/ EN/DWT/LA	Education and achievement of biodiversity targets	Approval of riparian owner and cost
18.6.3 Maintain existing wetlands	Environment Agency/ LA/Riparian Owner	Protect habitats	None
Grasslands			
18.6.4 Investigate restoration of the hydraulic connection between watercourses and floodplain	Environment Agency	Increased knowledge	Cost
18.6.5 Ensure protection of wet grassland through agri-environment schemes	MAFF/FWAG/ FRCA/Environment Agency	Protection of habitat	Limits of MAFF funding
Upper Moorlands			
18.6.6 Support the restoration of degraded heathland	Environment Agency/ EN/RSPB	Improved habitat	None
18.6.7 Investigate the methods of control of bracken and the effect on heathland (see Issue 14)	MAFF/Environment Agency	More sensitive management	Cost
Woodlands			
18.6.8 Review Agency consents by 1999 which may affect the SAC woodlands	Environment Agency	Protection of habitat	Human resources
18.6.9 Support plans for new plantations in the National Forest	Environment Agency/ RO	Increase tree cover	None
18.6.10 Investigate the extent of diseased alders in the Derwent and Amber valleys	Environment Agency/ EN/DWT	Increased knowledge and awareness	Human resources

3 Issues and Options

ISSUE 18 continued			
18.6.11 Investigate restoration of hydraulic connection between watercourses and floodplain to encourage more wet woodland	Environment Agency	Increased knowledge and habitats	Cost

Issue 19 Minimisation of industrial waste generation

Objective - to work with waste producers and ensure minimisation of industrial wastes

Since the Industrial Revolution the generation of waste by industry has been a problem. Many companies now recognise that this is environmentally unsustainable and directly affects the profitability of their enterprise. These companies have taken action to reduce the amount of waste they produce. There is, however, still a long way to go and the Agency is actively engaged in promoting initiatives, some of which have been enshrined in law, to reduce waste generation.

Companies operating Part A processes are required to use Best Available Techniques Not Entailing Excessive Costs (BATNEEC) to prevent, minimise and render harmless releases from their processes to all environmental media. They are required to examine their activities which generate waste and where possible, produce plans to reduce waste over time. Progress with this requirement will be monitored via the statutory four yearly review of Part A process authorisations undertaken by the Agency.

There have already been significant reductions in waste production achieved by Courtaulds in Derby in a number of its processes. Major reductions in waste and in releases to air have been achieved by plant modifications to the cellulose acetate process providing improved process control which has significantly reduced the number of "out of specification" batches requiring reprocessing or disposal.

Within this plan area there are two nuclear installations operated by Rolls Royce and three other premises that are authorised to dispose of radioactive materials at Derby City General Hospital, Derby Royal Infirmary and Derby University. These are the only two nuclear installations in the Midlands Region (see map 8).

Any establishment which generates radioactive waste is required by statute to hold an authorisation, issued by the Agency, which permits it to accumulate and dispose of such waste. (For nuclear installations the Agency regulates only the disposal of radioactive waste; the accumulation is regulated by the Nuclear Installations Inspectorate.) All authorised establishments are required to minimise the quantity of radioactive waste which is produced.

Nuclear installations are a particularly important potential source of radioactive materials in the environment and therefore, are subject to stringent regulation by the Agency. The Agency proposes to review the authorisation documents which relate to these installations, to re-examine the dose assessment¹ and by so doing, ensure continued stringent control and public safety. As part of this review the Agency will support work which is already planned, and encourage further work, to improve the recovery and re-use of radioactive materials thereby reducing the need for disposal.

¹No matter what the size of the establishment, the process of authorisation and review involves a critical assessment of releases to all environmental media to ensure that public safety is not compromised. The assessment of maximum receivable dose is based on extremely "pessimistic" assumptions about the behaviour of a theoretical individual or group exposed to releases from the establishment. Only if the dose to this critical individual or group is within the dose limits acceptable is the release accepted as satisfactory. Therefore, this use of a theoretical critical group ensures that significant safety margins are built into the assessment procedure.

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Issue 19 : Minimisation of industrial waste generation			
Options for action	Responsibility	Benefits	Constraints
19.1 Work with process operators to ensure that waste generating activities are critically examined and waste production is minimised	Part A process operators/ Environment Agency	Reduced costs to the process operator Easing of pressures on waste disposal facilities BATNEEC	Process requirements Lack of, and/or initial cost of introducing, alternative technologies
19.2 Work with owners of authorised establishments to ensure that radioactive waste generating activities are critically examined and waste production is minimised	Environment Agency	Reduced costs to owners of authorised establishments Easing of pressures on waste disposal facilities BATNEEC	Process requirements Lack of, and/or initial cost of introducing, alternative technologies

Issue 20 Minimisation of water use due to recent drought conditions

Objective - to minimise water usage where possible

Water is an essential resource used by agriculture, industry and for potable supply.

Agricultural demand is generally met through direct abstraction from rivers and aquifers. In addition to direct abstraction, industry also uses water from the public water supply system. Demand on the public water supply system is generated by customers using water and losses through leakage from the distribution network.

Historically water has been a cheap commodity for industry and unlimited, uninterrupted supplies are viewed as a right by domestic customers. Together with the domestic charging system, these factors have contributed to a culture of profligate water usage and little recognition of its true value. The ongoing drought, which started in 1995, has served to highlight the problem and progress has been made in understanding the environmental effects of wasting water. The introduction of waste minimisation, demand management measures and effective agricultural use has reduced the demand on supplies to some degree.

The level of leakage losses from the distribution and trunk main systems and customer supply pipes varies across the Midlands Region, depending on the length of pipe, number of connections and the age of the system. The leakage from a distribution system means that the system has to be 'oversupplied' to ensure that a secure source of potable water is supplied to customers. This 'extra' water has to be abstracted from surface water or aquifers, reducing availability to other users and the environment. The Environment Agency, Midlands Region, has stated that water companies should achieve economic levels of leakage before new abstraction licences are issued.

Across the whole of its water supply network, covering the majority of the Agency's Midlands Region, Severn Trent Water Ltd is committed to reducing leakage as a major part of its demand management strategy. Forecasts of leakage for 1997/98 by the company are for total leakage of almost 400Ml/d, 20.5% of their total supply. The target is to reduce leakage to 12% of supply by 1999/2000. There is also a commitment to reduce leakage from customers' pipes from a forecast 5.9% in 1997/98 to 3% by 1999/2000.

Industry is a significant water user in the area and the Agency proposes to encourage a reduction in water use by a range of initiatives. One in particular will be to examine closely the water used by companies operating Part A processes and encourage these companies to reduce water use wherever this can be achieved. Part A processes are those processes that have the most potential to cause serious pollution to air, land or water. The opportunity

3 Issues and Options

will be taken to address this specific issue as part of the authorisation four yearly review procedure which the Agency undertakes.

The Agency is also working in partnership with water companies and OFWAT to promote measures to manage and reduce public demand. This joint approach relates to various areas where reduction in demand can be achieved, thus enabling reduction in abstraction. The main areas of activity are:

- **Education and information programmes**
(eg. Road-shows, High Street displays, schools' guides, gardening tips, help lines)
- **Promotion of water efficient appliances**
(eg. low flush or dual-flush WCs, water efficient washing machines and dishwashers, trigger-gun sprinklers, water butts)
- **Promotion of low-cost retrofit water saving devices**
(eg. hippo bags, low flow shower heads, sprinkler exchange schemes)
- **Water audits**
(eg. washer replacement schemes, fitting hippos, fitting urinal controllers, installing waterless urinals, water use surveys)
- **Promotion of water recycling and reuse**
(eg. grey water recycling systems, recirculation systems, water butts)
- **Waste minimisation schemes**
(eg. Industrial process audits, waste minimisation clubs)
- **Leakage reduction programmes**
(eg. active leakage detection and repair, refurbishment and renewal programmes, for supply pipes, communication pipes, distribution mains, service reservoirs, raw water mains and reservoirs, installation of pressure reduction systems)

Issue 20 : Minimisation of water use due to recent drought conditions			
Options for action	Responsibility	Benefits	Constraints
20.1 Raise public awareness by education	Environment Agency/ Severn Trent Water Ltd	User awareness and reduced demand	
20.2 Reduce leakage to economic levels	Environment Agency/ Severn Trent Water Ltd/ OFWAT	Leakage reduced, more effective use of resources	Costs to Severn Trent Water Ltd Not a total solution
20.3 Reduce domestic leakage and demand	General public/ Severn Trent Water Ltd/ Environment Agency	Leakage reduced, demand reduced	Public bear costs on own property Domestic charging system offers no incentive
20.4 Introduce demand management measures	Industry/ Severn Trent Water Ltd/ Environment Agency	More effective use of resources, reduced demand	Costs Not a total solution

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ISSUE 20 continued			
20.5 Monitor effectiveness of demand management measures	Environment Agency/ Severn Trent Water Ltd	Identifies whether implemented measures are reducing demand and leakage	
20.6 Promote the efficient use of water resources in agriculture	Environment Agency/ MAFF/NFU/ Farmers	Reduction in demand for water, increasing availability for other users and the environment	
20.7 Work with Part A process operators to ensure that water usage is critically examined and minimised where possible	Environment Agency/ Part A process operators	Process operator reduced costs Easing of pressures on public water supply	Process requirements Lack of, and/or initial cost of introducing, alternative technologies
20.8 Do nothing			Alternative sources may be required. Poor publicity for water company

Issue 21 **Damage to the water environment and derogation caused by the operation of hydropower sites**

Objective - ensure hydropower sites operate in a manner that is not detrimental to the environment

The River Derwent and its tributaries have historically been used to generate power for the industries along their length. There remain a number of sites in the catchment producing electricity for the National Grid under the Government's Non Fossil Fuel Obligation scheme.

Operators must carefully manage and operate impoundments to avoid causing peaks and troughs in flows downstream. Because the Derwent is so highly regulated it cannot easily absorb the impact of these flow variations. This can potentially cause a number of problems. For example, the poor operation of Belper Mill hydropower site in the past, has resulted in problems for:-

Downstream abstractors - changes in flows and water levels can affect a number of licensed abstractions, particularly Borrowash hydropower sites, public water supply abstraction at Little Eaton and the abstraction of Courtaulds Chemicals at Derby.

Environmental damage - sudden low flows can cause lack of dilution for sewage effluent discharges from Spondon STP and contaminated surface water discharges from Derby SSWS. This can result in low oxygen levels and a subsequent threat to fisheries. Stretches of river between the impoundment and the tail race discharge point may be dried out while water levels recover, a distance of approximately 0.25 miles from Belper.

Visual amenity - tourism and leisure are important in the Derbyshire Derwent catchment. Poor management of hydropower schemes can result in dry weirs and river bed and a loss of visual amenity. Drying of the horseshoe weir and lowering of water levels at Belper Gardens are examples.

Hydropower schemes, in most cases, require abstraction licences, land drainage consents and sometimes impounding licences. Licence holders are additionally required to enter into legal agreements under Section 158 of the Water Resources Act 1991. These agreements set out management and operational rules designed to

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prevent flow problems in the river. The Agency enforces and reviews the conditions on these agreements on an ongoing basis.

ISSUE 21 : Damage to the water environment and derogation caused by the operation of hydropower sites			
Options for action	Responsibilities	Benefits	Constraints
21.1 Issue and review Section 158 agreements	Environment Agency/ Licence holders	Ensure best possible operation of sites	Human resources
21.2 Increase effectiveness of enforcement	Environment Agency	Ensure sites operate correctly and provides early warning of incidents	Human resources

Issue 22 Problems of utilising land identified as contaminated land

Objective - to establish after use for areas identified as contaminated land

There are areas of derelict land within the plan area. Of particular concern are the numerous abandoned small-scale metalliferous quarrying sites in the north of the area which are unsightly and tend to attract fly-tipping (see Issue 12). These may also have health and safety implications.

The majority of the Derbyshire Derwent plan area (excluding the City of Derby, in particular Pride Park) has not previously been subject to heavy industrial usage and is therefore thought not to have been significantly blighted by contamination.

It is the responsibility of Local Authorities to identify areas of contaminated land, and they are required to develop a strategy for doing so within 18 months of the new Contaminated Land Regulations being published. These Regulations are expected in mid 1998. The Agency advises the Local Authorities on the strategy and shares appropriate information.

The Pride Park site to the east of the city was identified as an area of contaminated land. The development of this site highlights the amount of control that is necessary to ensure that contaminated land does not affect other environmental media such as water. The nature of the Pride Park site has necessitated the construction of a groundwater treatment plant. A consent to discharge to the adjacent River Derwent from the plant has been designed by the Agency to cover all parameters present on the site. Levels for the discharge have been set appropriate for a river that is used for public water supply. There are 54 different contaminants within the consent to discharge which will be monitored regularly. In the long term it is the synergistic/antagonistic effects of such a complex effluent that will be investigated. It is proposed to put this discharge forward for Direct Toxicity Assessment with a view to replacing a number of the individual parameters with an overall Toxicity Condition.

It is proposed that the surface water drainage from the site is also monitored regularly for key parameters such as BOD, ammonia and phenols. All of the above will be complimented by biological sampling.

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ISSUE 22 : Problems of utilising land identified as contaminated land			
Options for action	Responsibility	Benefits	Constraints
22.1 Investigate and establish the locations and the demand for derelict land restoration	Local Authorities/ Environment Agency	Obtain accurate information Clear strategy Commonality of approach	Current lack of common strategic approach Incomplete information
22.2 Investigate the potential partnerships to accelerate derelict land restoration	Local Authorities/ Environment Agency/ English Partnerships/ Riparian Owners/ Potential Developers	Land put to beneficial use Less likely to attract polluting activities such as fly-tipping	No current common strategy Limited resources
22.3 Establish a detailed management agreement for the operation of Derby Pride site	Derby Pride/ Environment Agency	Ensures water quality and impact of the treatment plant is fully assessed and that somebody is responsible for the plant in the long term	Ensuring all parties sign up to an agreement Responsibility for drawing up an agreement

Issue 23 The risk of flooding to undefended properties and to properties where existing flood defences require enhancement

Objective - to identify properties at risk from flooding and investigate the potential to provide flood protection

There is a risk that properties at Bakewell, Rowsley, and to a lesser extent at a number of other undefended locations, can be affected by flooding from Main River watercourses within the catchment. Where it is practical these properties currently receive flood warnings as part of the Agency's flood warning scheme.

It is considered however that the feasibility of carrying out flood defence schemes at these undefended locations should be investigated, the first priority being given to Bakewell and Rowsley. In order for any scheme to be considered it will be necessary to demonstrate that the benefits exceed the costs of the works. All new schemes must also consider conservation aspects to ensure that such an engineering scheme can be accommodated in an environmentally sensitive manner.

There is also a risk that properties at Bradwell and Castleton can be affected by flooding from ordinary watercourses within the catchment. The Agency, however, is not empowered to undertake works that affect an ordinary watercourse.

It has been identified that the existing flood defences and ground levels adjacent to the River Derwent, south-east of Derby centre provide a less than adequate standard of flood protection than is desirable for large industrial sites and housing developments.

In order to minimise the risk of flooding to properties from Main River watercourses it is necessary to ensure that existing flood defences are to an appropriate level and that their structural integrity is adequate.

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ISSUE 23 : The risk of flooding to undefended properties and to properties where existing flood defences require enhancement			
Options for action	Responsibility	Benefits	Constraints
23.1 Investigate feasibility of defending properties at risk from flooding at Bakewell and Rowsley	Environment Agency	Flood protection of properties	Need to demonstrate that benefits of any proposals outweigh the costs
23.2 Investigate feasibility of defending properties at risk from flooding at Bradwell and Castleton	Local Authority	Flood protection of properties	Cost
23.3 Do nothing	None	None	Risk of flooding to parts of Derby
23.4 Construct new flood defences along the River Derwent between Wilmorton Railway Bridge and Spondon	Environment Agency	Protection of properties to 1 in 100 year standard	Benefits of proposed scheme to exceed costs

Issue 24 Control of the development of floodplains

Objective - identify the limits of the floodplain for main rivers to minimise future flooding risk to property

There is increasing pressure for the development of floodplains within urban areas. Developments in floodplains will be at risk from flooding and may increase the flood risk elsewhere by reducing the storage capacity of the floodplains and/or impeding the flow of floodwater. The raising of ground levels by tipping, or following restoration of gravel workings, may have a similar effect.

The Agency's aim therefore is to protect floodplain areas. A national document entitled 'Policy and Practice for the Protection of Floodplains' sets out the Agency's flood defence policies in relation to floodplains and explains the reasoning behind them.

In order to control development on floodplains effectively it is necessary to define their extent accurately. Floodplain maps are used by the Agency when making recommendations to Local Planning Authorities as a statutory consultee on development proposals. Currently the floodplain of the Rivers Derwent and Wye are inadequately defined and therefore may result in unsustainable development.

ISSUES 24 : Control of the development of floodplains			
Options for action	Responsibility	Benefits	Constraints
24.1 Complete floodplain mapping for the Rivers Derwent and Wye	Environment Agency	To control development in the floodplain effectively and thus reduce the risk of flooding to property	Cost

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24.2 Identify other areas for floodplain mapping	Environment Agency	To control development in the floodplain effectively and thus reduce the risk of flooding to property	Cost
24.3 Do nothing			Risk of unsustainable development in the floodplain

Issue 25 The inability to provide scientific interpretation due to the lack of air quality data

Objective - work with Local Authorities to improve air quality data collection

In common with most of England there is a paucity of data on air quality within the plan area. Until very recently there has been little continuous monitoring apart from facilities in the City of Derby. High Peak and Derbyshire Dales District Councils have been awarded a grant under Phase 1 of the DETR Air Quality Management Demonstration Project to measure small particulates in air (PM₁₀s) at a number of sites near to working quarries in the north west of the area. Some preliminary data is available at the time of writing and the Agency will work with the Local Authorities to identify sources and priorities to be incorporated into this plan.

Through legislation¹ aimed at establishing a national system for local air quality management, the Government is seeking to introduce new air quality standards (recommended by the Expert Panel on Air Quality Standards - EPAQS) for a range of pollutants², by the year 2005.

Within the Derbyshire Derwent catchment there are a number of industries regulated by the Agency which release one or more of the specified pollutants. The Agency proposes to work with Local Authorities to establish the current levels of these pollutants in the air and a source inventory. The Agency will work with industry to bring about reductions in the amount of the specified pollutants released with the aim of meeting the new air quality standards by the designated date. There is also a need to work to a national scale as air quality may be affected by sources from outside the plan area.

¹The United Kingdom National Air Quality Strategy.

²Benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide, ozone, fine particles (PM₁₀) and sulphur dioxide.

ISSUE 25 : The inability to provide scientific interpretation due to the lack of air quality data			
Options for action	Responsibility	Benefits	Constraints
25.1 Work with Local Authorities to obtain air quality data and to establish a pollutant source inventory	Local Authorities Environment Agency	Will permit identification of problem areas and pollutant sources for priority action	Resources "Cross boundary" influences

4 Protection through Partnership

This section highlights a number of partnership approaches between the Agency and others and puts forward policy guidance for planners. It also looks at the role of education.

Introduction

Our natural environment is complex and environmental management must be undertaken in many different ways by the broad community both in the short and long term. Where we do have a good understanding of a particular element of the environment the implications of change often remain difficult to predict and understand. The linkages between our society, economy and environment vary over time and the effect of what may at first be a local issue, can have wider regional and even global effects. Work is underway in the UK and across the world to define sustainable development indicators which can be used to assess environmental change.

It is this kind of understanding that led to the Earth Summit in Rio in 1992 and the adoption of sustainable development principles with a commitment to manage the environment in an integrated way through partnership (see Section 1.3). In this plan it is partnerships that will enable the vision and the key objectives to be realised. Such partnerships provide accountability, as well as a means of attracting inward investment, to improve the environment, from such bodies as the European Union (EU) and the National Lottery. This helps to reduce duplication between agencies and allows the pooling of scarce resources.

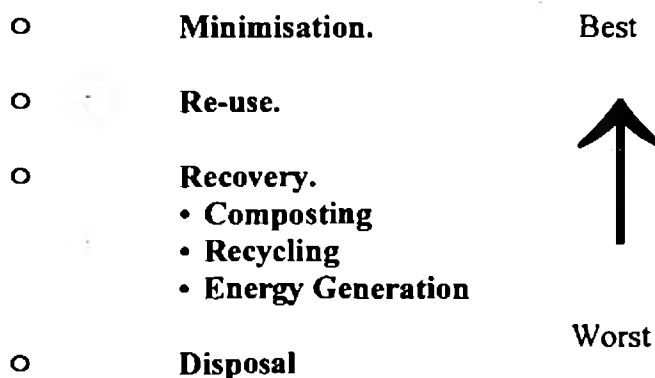
The plan raises a number of issues that will require a joint approach if they are to be solved. Partnerships will be developed in the short term to address many of the issues through the Action Plan. Environmental management often requires a long term approach which can only be effective through the policies and practices of other interested groups.

The Agency is well placed to influence many activities affecting the environment through its own legislative powers, but these are limited in extent and do not necessarily confirm ownership or acceptance of the issues involved. The 1990 Government White Paper, "This Common Inheritance" recognised the need for co-operation and joint working when discussing overlapping responsibilities of Local Authorities and other environmental enforcement agencies. Subsequent international agreements and government guidance have further established this principle. Education is also important in changing attitudes and work practices to promote sustainable development.

4.1 Waste minimisation

The key sustainable development objectives for waste and waste management is to minimise the amount of waste that is produced, to make best use of the waste that is produced and to minimise pollution from waste. The Government has defined a hierarchy of waste management options which are ranked to give a broad indication of their relative environmental impact.

The Waste hierarchy:-



4 Protection Through Partnership

The best option is not to produce waste in the first place. Milk deliveries and milk bottles are a good example of re-use. Recycling includes bottle banks, newspaper banks etc. These require additional energy and the production of further wastes to make useful products. Energy generation covers incineration using waste as a fuel. The final option is disposal to landfill which is currently the main form of waste disposal in the UK. The Agency's objective is to move waste management further up the waste hierarchy while retaining the best practical environmental option. Clearly we all have a part to play in reducing the amount of waste produced and making the best use of the waste that is produced. Household waste can be reduced by individuals taking responsibility by re-using, re-cycling and composting and also by buying long life, reusable and environmentally friendly products with minimal packaging. According to the Department of the Environment approximately 50% of household waste is potentially recyclable. Local Authorities have been set targets by the Government to recover up to 40% of household wastes in England and Wales by 2005.

Individuals and businesses should:-

- Support local waste minimisation and recycling initiatives.
- Support the extension of minimisation and recycling initiatives in their area (such as the provision of home composting bins).
- Reduce the amount of material thrown away.
- Respond to consumer demand to reduce unnecessary packaging and other forms of waste production.

4.2 Partnerships in Environmental Protection

4.2.1 Local Agenda 21

Agenda 21 was one of four main agreements signed at the Earth conference at Rio by representatives of 150 countries including the UK government. It is intended to be a:-

"Comprehensive programme of action needed throughout the world to achieve a sustainable pattern of development for the next century".

This is an environmental action plan for the next century, which recognises the central role of Local Authorities and the value of partnerships and the local community in achieving sustainable development.

One of the most exciting aspects of Agenda 21 is that it recognises that action by national governments alone is not enough and that all groups - civic, community, business and industrial have to be involved to bring about change. It promotes the idea of thinking globally and acting locally. Local Authorities in some areas have undertaken a consultative process with local people and to achieve a Local Agenda 21 for their community. A Local Agenda 21 Draft Consultation Document has been drawn-up by Derbyshire County Council. It is similar in its approach to the Agency's LEAP process in that it seeks to gain input from as many interested parties as possible.

The consultative process does not just occur at the county level but also at District level, for example Derby City Council have recently sent out a questionnaire to obtain opinions of a sustainable future for Derby. A pilot project has also been undertaken in the village of Tideswell, called Tideswell 2000, to involve local people in producing a sustainable future for the village.

It is the aim of the Agency to integrate LEAP and Local Agenda 21 programmes where appropriate, and it is hoped that this consultation document will assist in developing a working relationship between the Agency and interested parties in both the above programmes where applicable.

4.2.2 Integrated Pollution Control improvement programmes

The system of Integrated Pollution Control (IPC) is a long term approach to environmental regulation. An IPC authorisation has two aspects:-

- Limits on the emission of pollutants.

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- Improvement programmes for older processes to reduce emission levels to meet the standard of the best of today's technology.

Improvement programmes can be long term with high levels of capital expenditure. They cover activities such as the installation of new equipment, to reduce emissions, and the assessment of processes to determine whether changes can be made to reduce the generation of effluent or minimise the generation of waste. The Agency works closely with operators to identify the improvements required and to develop realistic targets for their implementation. Such programmes are developed locally and nationally. National programmes include the reduction of sulphur dioxide (SO₂) and oxides of nitrogen (NO_x) emissions from oil and coal fired power stations in England and Wales.

4.3 Land use planning

Land use is the single most important influence on the environment. Human activity can have both positive and negative impacts on the environment. Redevelopment and renewal can do a lot to repair the damage of the past, while controls on new development can protect sensitive habitats and biodiversity and can prevent increased emissions of pollution to air, land and water.

4.3.1 Planning Liaison

The control of land use change is primarily the responsibility of Local Planning Authorities (LPAs) through the implementation of the Town and Country Planning Acts. Local development plans provide a framework for land use change and are key considerations in the determination of planning applications. Government planning guidance supports cooperation between LPAs and the Agency in relation to land use and the environment.

The Agency is a statutory consultee in respect of development plans and certain categories of planning applications. This allows the Agency's views to be considered by the LPA prior to a planning application being decided or policies in a development plan being approved. Planning liaison is the link between the Agency's functions and Local Authority planners. Guidance on the types of planning applications we would wish to see is contained in the Agency's document "Liaison with Local Planning Authorities".

4.3.2 Development Control Guidance

The following is draft guidance to LPAs from the Agency on a number of areas of mutual interest. Town and Country Planning can support sustainable development and work towards meeting the country's commitments to biodiversity and global warming. Some of these policy approaches should be at the regional level, while others should be considered in a more local context.

Transport and Infrastructure

Road traffic accounts for some 25% of the UK's contribution to global warming. Vehicle use also contributes towards acid rain through the production of sulphur dioxide and oxides of nitrogen.

Regional policies should be in place to minimise the need for travel by locating as far as possible, homes, places of work and other facilities in reasonable proximity to each other. Such broad policies offer the basis for more detailed land-use policies. For example, a preference for new employment sites and retail developments to be sited close to good public transport networks and away from locations that cannot readily be served. Such an approach should also influence the Structure Plans and Part I Unitary Development Plans with respect to the distribution of new housing.

Commitments outlined in the Local Agenda 21 action programmes of Local Authorities encourage:-

- Extending the provision for cyclists and for the safe movements of pedestrians;
- Promotion of public transport as an attractive substitution for car use;
- The reduction of energy consumption and pollution by unnecessary journeys to work, shops and leisure facilities.

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In Derbyshire one of the key challenges in the Local Agenda 21 Draft Consultation Document is to promote sustainable transport to cut congestion on Derbyshire roads and improve public transport. As mentioned in previous sections, Derbyshire, and in particular the Peak National Park, receives large numbers of tourists each year. The problem is to find a solution to peoples' reliance on the private car.

The various measures proposed in the document have differing timescales from short to long term, and range from encouraging more public transport usage through enhanced routes and ticket schemes, to supporting the reopening of rail links.

Energy

Although the Agency is responsible for the regulation of emissions to the environment from power stations it has little direct influence on the consumption of energy within the area, although we are in a position to help influence planning policy and its impact on energy use. Energy conservation is important to combat global warming and the long term sustainable use of non-renewable resources.

Planning Policy Guidance Note 12 (PPG12) states that structure plans should include policies for energy generation, including renewable energy. Structure plans and UDP Part I's should include policies and proposals for providing renewable energy in their area. Plans need to address the potential conflict within development areas for such installations and the protection of landscape and wildlife. They should propose the criteria to be applied to planning applications for renewable energy installations in National Parks and Areas of Outstanding Natural Beauty (AONBs).

In addition to providing for renewable energy installations, development plans can affect energy conservation through development patterns. PPG 12 offers guidance to Local Authorities in this respect. The Council for the Protection of Rural England (CPRE) has produced a document, "Energy conscious planning", highlighting the integration of energy issues in land-use planning.

Within Local Plans, energy related policies may be expected to provide a more specific framework for development control decisions which would apply not only to greenfield developments, but also to redevelopment and infilling within existing settlements.

Given this context, it is appropriate for Local Planning Authorities to pursue policies which:-

- Discourage low density development.
- Promote some degree of concentration of principal employment activities and community facilities.
- Ensure that new development is well related to established or convenient public transport routes.
- Encourage energy-sensitive siting, orientation and layout of new development, particularly in order to allow future energy saving technologies to be accommodated.

In addition to planning, the building regulations section of Local Authorities are also influential, for example in terms of energy efficient buildings.

Natural Habitats and Biodiversity

Whilst many species native to the UK are relatively common, between about 10 and 20 % of native species are considered threatened (HMSO, March 1996). A monitoring programme is being established under the Biodiversity Action Plan (BAP) to measure changes in both the extent of habitats and their quality, in terms of the populations of characteristic flora and fauna found in them (Issue 18).

There are three BAPs in Derbyshire, however only two of these actually fall in the Derwent plan area, these being the Peak District and Mid Derbyshire Local Biodiversity Action Plans. The production of the Plans stem from the Earth Summit in Rio 1992 and in its similarity to LEAPs it seeks to focus the efforts of partner organisations. The focus will be to enhance the biodiversity resource, taking account of local, national and international priorities.

Ecological issues have traditionally been reflected as restraint policies in development plans. As a result of the

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growing strength of wildlife groups and the more widespread use of Environmental Assessments, a wider range of ecological matters can now be addressed in plans. Policies should be in place to promote ecological diversity.

As advised in PPG 12, although the principal use of a site may be for housing or other development, schemes should be designed to retain natural features on site and where none exist, to create new habitats or features to encourage wildlife. Local Plans offer the opportunity to incorporate policies to replace wildlife resources lost through development using Section 106 Agreements.

Policies should be offered along the lines of:

"All new development should preserve and enhance existing elements of nature conservation importance. New and existing development should offer the opportunity to create new areas of semi-natural habitat by the use of appropriate design and species in landscaping schemes and to incorporate features to attract wildlife".

Land reclaimed through derelict land reclamation offers the potential to create new areas of value.

As indicated, reclaimed open space offers greater potential for both increased habitat diversity, through large scale tree planting, wetland habitat promotion and the promotion of wildlife corridors.

Waste Management

The management of waste impacts on land use. The location of landfill sites and the operation of waste transfer stations affects the proposed use of land and the amenity of surrounding areas.

Planning permission should not be granted for the deposit of biodegradable waste within 250m of any development unless measures can be taken to monitor and control landfill gas. In any event permission should not be given for the deposit of biodegradable waste within 50m of development. Without correct management, the migration of landfill gas can give rise to the risk of explosion in buildings, underground services or voids. It also presents a risk of asphyxiation.

Where a proposed development might be at risk from migrating landfill gas, the Agency can advise on the work required to protect property. Any residential development within 50m of a known gassing landfill should be refused unless the developer can clearly show how it will be protected.

Methane generated in a landfill site must be controlled in order to minimise its impact on the environment. Collecting it and using it as a fuel has two benefits, by avoiding pollution and generating energy. There should be a presumption against the passive venting of landfill gas unless it can be shown that methane oxidation is reducing methane emissions to a low level. Planning applications to utilise landfill gas for the generation of energy should generally be encouraged.

Waste transfer stations can have an adverse impact on the amenity of nearby properties through dust, noise and smell and can cause considerable pollution to rivers and streams from run-off. Planning permission for waste transfer stations accepting over 100 tonnes of biodegradable waste a day should only be permitted if the sites are operated under cover except where waste is deposited into closed containers for prompt disposal elsewhere.

Flood defence and the control of surface water run-off

Importance of floodplain

River channels have a limited capacity and when this is exceeded, flooding of the adjoining land known as the floodplain occurs.

The need to protect floodplains has not always been recognised and they have sometimes been subjected to inappropriate development. Rivers and their floodplains are finite resources which need to be managed in accordance with the principles of sustainable development.

If flood risks to land and property are not to be increased and the ecological value of rivers and floodplains is to

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be safeguarded, then rivers and their floodplain need to be protected from activities, such as development, which may adversely affect them.

The impact of urban development and the control of surface water runoff

The urban development of a catchment can have the following major effects on the hydrological regime:-

- Increased volumes of storm water runoff.
- Higher peak flow rates and flood water levels.
- Lower base flows in rivers and streams.
- Inundation of available storage in (and conveyance capacity of) river corridors.
- Reduction in soil moisture recharge leading to a reduction of groundwater resources.
- Increase in pollutant loads carried into sewers or surface waters.

Urban runoff should be considered as a resource. The management of urban runoff to mitigate its adverse impact on the water environment is the concept of "source control" which aims to identify local and more sustainable solutions for surface water management, without giving rise to detriment in groundwater quality.

Key Points:-

- Wherever appropriate surface water should be disposed of as near to the point of incidence as possible. Site owners and occupiers will have to assume a greater responsibility for surface water management.
- Clean and contaminated surface water should be kept separate.
- The use of "softer" engineering structures such as swales, detention ponds, infiltration basins and porous surfaces should be encouraged as alternatives to conventional drainage where appropriate and practical. Ideally these techniques should be considered in preference to conventional drainage systems providing there are no adverse impacts on groundwater resources.
- When planning a development, surface water management should be considered as a fundamental part of the design and operation of the project. The retention of water on site for low grade usage such as landscape management and vehicle washing can also reduce the demand on the potable supply system giving further environmental benefits.
- The active promotion of surface water runoff disposal to infiltration basins may have an additional benefit as a means of artificial recharge to aquifers. The potential quality problems for groundwater where very polluted runoff could be involved may limit this option to surface waters draining non-industrial locations, but in any case full assessments will be needed.
- Infiltration drainage should be considered for developments proposed in areas where the existing combined sewer capacity is a limiting factor.
- Source control should apply to roads as well as buildings.

Adoption

If a source control system is to be incorporated into a road drainage system, for example by means of a soakaway system or reed bed, then such a system can become the responsibility of the highway authority. If the system is to be incorporated into an area of public open space, through a Section 106 agreement or a unilateral understanding with the developer, then the Local Authority can adopt it. It is currently the policy of the Statutory Sewerage Undertakers in England and Wales not to adopt infiltration systems. We are working with Local Authorities and sewerage undertakers to change attitudes to make adoption more acceptable.

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4.4 Education

Education is a key objective for the Agency and a major plank in its strategy for environmental protection and improvement. It is essential to the delivery of cleaner more sustainable environment in the long term. In many cases a lack of information and awareness is one of the factors which leads to environmental damage or neglect whether it be by accident or deliberate. There is a need for a greater level of educational involvement by the Agency and a need to raise awareness of environmental issues. The Agency has recently published its education strategy "Green Shoots" which considers environmental education into the next century.

Our goals are to:-

- Build positive partnerships through consultation, joint ventures and sponsorship.
- Help educate young people through teaching aids and other initiatives.
- Improve understanding of environmental issues, through links with education, work placements and an awards scheme.
- Work with industry and produce marketing campaigns to promote prevention of pollution rather than its remediation.
- Foster public awareness of environmental issues to encourage responsibility for the environment and its challenges.
- Build on established and create new, international relationships to further global sustainable development.

The Agency has produced a wide range of educational material and much of this information is free of charge. Please contact: Sue Quinlan, Customer Services Team Leader Tel: (0115) 9455722 Ex 3696.

4.4.1 Educational initiatives

The Agency undertakes a wide variety of pollution prevention, waste minimisation and education initiatives with local communities, business, Local Authorities and others.

Specific initiatives include:-

Water pollution prevention

- in excess of 100 pollution prevention site inspections a year in the catchment to business and agriculture.
- Agency and Derbyshire Fire and Rescue Service operate a joint approach to pollution prevention and containment at incidents.
- Distribution of leaflets to Local Authorities, schools, libraries etc.

Local Authority liaison

- Planning roadshows to improve relations between LPAs and the Agency.
- Promotion of "source control".

Waste Management

- Producer responsibility

The draft Producer Responsibilities (Packing Waste) Regulations place an obligation on certain businesses to recover and recycle specific amounts of packaging waste. Area offices are capable of responding to queries from local businesses and provide advice and information.

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○ Waste minimisation

The Agency will promote best practice in waste management and special waste regulations.

4.4.2 Schools education

The Agency is committed to improving its education work with schools. The Agency is one of a number of organisations working with schools and there are opportunities for joint approaches. Information to schools will dovetail into the national curriculum.

Attention is being focused at key stages 2 and 3 and there is a commitment to provide information for 'A' level and university students. The Agency is developing its own national education strategy and work in the LEAP area will accord with that framework.



Photographs 5 and 6 show the Agency's stand at Bakewell Show in August 1997

PART II

SUPPORTING INFORMATION

Introduction

Part I of the plan introduced you to the Agency and the LEAP process. In detail it described the Derbyshire Derwent environment and the key issues associated with the area. Options and proposals have been identified together with the key partners who, with the Agency are committed to and responsible for the environmental improvements.

This part of the report provides background information that supports the Issues in Section 3 and partnerships and policies in Section 4.

Section 5 - Uses , Activities and Pressures. This section looks at the uses, activities and pressures in the catchment which impact on the local environment. This is split into a number of uses and activities, with each subsection looking at general approach of the Agency and the local perspective.

Section 6 - State of the Environment. This section identifies the current state of the environment and provides local environmental information from our monitoring and assessment of the catchment. This information is set against standards and targets, from which many of the issues have been generated. This is not a "State of the Environment" report but the information should be of interest to a wide range of organisations and individuals.

Section 5 - Uses, Activities and Pressures

The following subjects are examined in turn, from both a general and a local perspective:

- 5.1 Development and infrastructure**
- 5.2 Integrated Pollution Control**
- 5.3 Waste management**
- 5.4 Contaminated land**
- 5.5 Mineral working**
- 5.6 Agriculture**
- 5.7 Sewage and industrial effluent disposal**
- 5.8 Water resources and abstraction**
- 5.9 Flood water storage and flood defence**
- 5.10 Conservation; sites of ecological importance**
- 5.11 Fisheries**
- 5.12 Recreation**
- 5.13 Heritage**

The above activities exert pressures on the environment and change its state in terms of its quality and its stock of natural resources. In many cases it is these activities that have resulted in the Issues that were raised in Section 3. The effects these activities have upon the local environment are examined in the next section.

5 Uses, Activities and Pressures

5.1 Development and infrastructure

General

New building works, changes in land use, development of communications and the construction of new roads, sewers and other services can have a major impact on an area and uses of the environment. The Agency has a responsibility to protect the environment and to achieve this aim it must work closely with Local Planning Authorities (LPAs).

The Agency is a statutory consultee under planning legislation and advises Local Authorities on development proposals that can have an impact of matters relevant to the Agency (see section 4.3.1).

The Agency operates at all levels of the planning system. At the national level there is direct liaison with the DETR (Department of the Environment, Transport and the Regions) and Local Authority associations, seeking to influence Planning Policy Guidance Notes (PPGs), Circulars and new legislation. At the regional level there is liaison with government offices and regional steering groups with the aim of influencing regional planning guidance. At the local level we are consulted on structure and local plans, mineral local plans and waste plans to ensure our interests are protected and that development proposals have positive (sustainable) impacts on the environment.

The Agency also seeks to pursue its aims and policies regarding development through the planning consultation process for individual proposals. Although the final decision on the planning matters rests with the LPA, government guidelines advise on the need to consider the Agency's concerns when determining proposals.

Local Perspective

The Regional Planning Guidance for the East Midlands was published in 1994 (reviewed in 1996). This guidance recognised the need to achieve sustainable development and aims to influence the policies of structure and local plans to achieve a coherent development strategy for the region.

There are two structure plans and one unitary development plan within the Derbyshire Derwent plan area prepared by Derbyshire County Council, Peak District National Park Authority and Sheffield City (although only a small area is within the plan area), respectively which provide a broad strategic framework for planning and development control in the County. Derbyshire is currently in the process of reviewing the plan and the Agency is involved in this consultation process.

The existing statutory local plans and those currently in preparation are shown in Table 2. Local plans are prepared to be in conformity with the Derbyshire County Structure Plan. Derby City is now a Unitary Authority and will be producing a Unitary Development Plan which will consider both strategic and local planning issues. Joint working between the County Council and the City of Derby should ensure broad conformity between the two authorities on strategic planning issues.

Table 2 - The status of Development Plans within the Derbyshire Derwent plan area

Local Planning Authority	% of LPA in LEAP area	Estimated popn. in LEAP area	Development Plan Title	Status and Consultation Date
Derbyshire County Council	33%	348,491	Derbyshire Structure Plan Derbyshire Minerals Plan	Consultation Draft 1996 Deposit February 1996
Peak District National Park	65%	26,986	Peak District National Park Local Plan Structure Plan	Deposit Draft Spring 1997 Adopted 1994 Review

Table 2 continued				
Amber Valley Borough Council	82.86%	75,320	Amber Valley Local Plan	Adopted August 1994 Under Review
Ashfield District Council	4.3%	3,400	Ashfield Local Plan	Adopted
Bolsover District Council	14.54%	31,720	Bolsover Local Plan	Consultation Draft February 1996
Derby City Council	70.31%	161,625	Derby City Local Plan	
Derbyshire Dales District Council	61.54%	49,590	Derbyshire Dales District Council Local Plan	Deposit Edition including proposed changes February 1996.
Erewash Borough Council	32.54%	13,480	Erewash Borough Local Plan	Adopted September 1994 under review
High Peak Borough Council	50.20%	26,350	High Peak Local Plan	Deposit Draft May 1995
North East Derbyshire Borough Council	26.94%	13,160	North East Derbyshire Local Plan	Deposit Draft including proposed Pre-Inquiry changes September 1996
Sheffield City Council	6.5%	Negligible	Sheffield Unitary Development Plan	Modifications to Deposit Autumn 1997
South Derbyshire District Council	3.55%	832	South Derbyshire Local Plan	Notification of intention to Adopt and modifications to deposit Summer 1997
Notes:- The stages in the preparation of local plans prior to their adoption is as follows: consultees and member of the public may initially comment on a consultation draft of the local plan. A deposit draft is then available for a statutory six week period, after which all representations are considered. A public inquiry is then held at which objections to the plan are considered at which objectors can be represented in person and evidence cross examined. An inspector considers all objections raised and produces a report on recommended changes to the plan. The planning authority may then accept the recommendations and adopt the plan or propose modifications, in which case there is a further period of public consultation. This process may be repeated with further modifications and a second public inquiry in exceptional circumstances. Once it is satisfied that all objections have been accommodated, as far as possible, the planning authority will give notice of its intention to adopt the plan.				

5.2 Integrated Pollution Control

5.2.1 Part A processes

General

Industrial processes regulated under the Environmental Protection Act 1990 are regulated either by the Agency or by the relevant Local Authority. In general, the Agency is responsible for regulating those processes having the greatest potential to cause pollution, the so called 'heavy' industrial processes. Part A processes are those with the greatest potential for serious pollution to air, water and land. There are approximately 2,000 Part A

**Derbyshire Derwent
Local Environment
Agency Plan**

Map 8



**ENVIRONMENT
AGENCY**



5 Uses, Activities and Pressures

processes in England and Wales; these processes are those which are considered to have the greatest potential for serious environmental pollution.

Local Perspective

There are 26 Part A processes operating in the plan area at the time of writing. These are listed in Table 3 and shown on Map 8. The table also lists any significant pollutants released to air and water from each process and the significant issues being addressed for each process. It is expected that the number of Part A processes within the plan area will increase slightly over the life of this LEAP.

Table 4 below shows the quantity of the most significant pollutants which were released to air and water from the Part A processes in 1995. (The data has been extracted from the HMIP/Agency 1995 Chemical Release Inventory, the last full year for which collated data is currently available.) It should be noted that this data includes figures for the coal fired power station operated by Courtaulds in Derby, which has since closed (see Section 5.2.3. local perspective). It does not, however, include figures for a number of processes which were not authorised until later. Most of the releases into the air of carbon monoxide, carbon dioxide, sulphur dioxide, oxides of nitrogen and particulate matter came from large combustion processes and the cement and lime processes. The releases of volatile organic compounds into the air (including a number specific substances such as acetic acid, benzene and trichlorethylene) arose mainly from the chemical processes operating in the plan area. The most significant releases to water (both controlled water and sewer) arose from the chemical and non-ferrous metal processes.

5.2.2 Storage and disposal of radioactive materials

General

The Radioactive Substances Act 1993 provides for controls to be exercised over the use and keeping of radioactive materials and the accumulation and disposal of radioactive wastes. The Agency is responsible for the administration and enforcement of the Act in England and Wales. This takes the form of registrations and authorisations; the former being required for keeping radioactive material and the latter for accumulating and disposing of radioactive waste.

All usages and disposals are subject to regulation by the Agency. Various exemption orders made under the Act permit the holding and disposal of radioactivity, where the use is widespread and the quantities involved are of such low magnitude as not to present a significant risk to the public or the environment.

Radioactive materials are used in a wide range of devices, such as density gauges, level detectors, antistatic units and flow meters. All of these devices require a registration.

In hospitals, universities and research companies, radioisotopes are used for treatments, diagnosis and labelling compounds. These activities require registration under the Act and generally result in the requirement for accumulation of the radioactive waste prior to disposal, which requires an authorisation to be issued by the Agency. Nuclear licensed sites are also regulated by the Agency and require authorisations to dispose of radioactive waste.

5 Uses, Activities and Pressures

Table 3 - Part A processes

Company	Type of process operated	Significant pollutants released to air	Significant pollutants released to water	Significant issues
Bernhard Metals (UK) Ltd, Derby	Non-ferrous metals	Particulates, ammonia	---	Abatement of releases to air/elimination of dark smoke. Elimination of potentially odorous releases.
Blue Circle Cement plc, Hope	Cement	Particulates, oxides of sulphur, oxides of nitrogen	---	Reduction of frequency of electrostatic precipitator trips leading to reduced particulates releases. Installation of new abatement equipment. Reduction in releases of oxides of nitrogen/reduced impact on local SSSI.
Buxton Lime Industries Ltd, Tunstead	Cement and Lime	Particulates, oxides of sulphur, oxides of nitrogen	Suspended solids	Sulphur dioxide emissions from the cement process. Installation of abatement equipment to reduce particulate releases and of wheel wash facilities for all vehicles.
Buxton Lime Industries Ltd, Hindlow	Lime	Particulates, oxides of sulphur, oxides of nitrogen	---	Installation of abatement equipment on kilns/ minimisation of releases to air.
BOC Ltd, Derby	Organic chemicals	Acetylene	---	---
Brake Linings Ltd, Buxton	Asbestos	Particulates	---	Elimination of asbestos emissions.
Courtaulds Chemicals Ltd (3 processes), Derby	Organic chemicals; inorganic chemicals; petrochemicals	(1) Particulates, benzene, acetic acid; (2) ethylene oxide, propylene oxide; (3) volatile organic compounds	(1) Benzene, acetic acid; (2) phosphate esters; (3) ---	(1) Reduction of releases to air and sewer, particularly benzene and acetic acid. Installation of new process lines. (2) Introduction of pumped off-loading system. Reduction of releases of phosphate esters to river via sewer. (3) Installation of new control equipment to minimise releases of volatile organic compounds.
Derwent Cogeneration Ltd, Derby	Combustion	Oxides of nitrogen, carbon monoxide	---	Elimination of problems associated with operating on standby liquid fuels.
Durga Environmental, Flagg	Incineration	(Products of combustion)	---	---
Elastogran UK Ltd, Somercotes	Di-isocyanate	Di-isocyanate (MDI)	---	To reduce further releases of MDI to air.
HJ Enthoven & Sons, Darley Dale	Non-ferrous metals	Lead, other metals, particulates	Lead; other heavy metals	Improvements to fugitive releases arising from various activities. Improvements to environmental performance of scrap pot. Segregation of process and surface drainage to permit improved processing together with upgrading of effluent treatment plant.
Exchem Explosives (3 processes), Alfreton	Organic chemicals	(1) Monomethylamine; (2) oxides of nitrogen; (3) volatile organic compounds	---	(1) --- (2) Reduction in releases of oxides of nitrogen. (3) ---
Lead Chrome Colours Ltd, Derby	Inorganic chemicals	Oxides of nitrogen	Heavy metals	Investigate the potential to reduce heavy metal releases to water.
Lea Ronal (UK) plc Buxton	Non-ferrous metals	Particulates, oxides of nitrogen, hydrogen chloride	---	---
Joseph Mason plc (2 processes), Derby	Organic chemicals	(1) & (2) Volatile organic compounds	(1) Phthalates; (2) ---	(1) Reduction of odour problems associated with off-site sewers. Improvement of bunding arrangements. (2) ---
Pb Batteries, Somercotes	Inorganic chemicals	Lead	Lead	Improvements in control of releases to sewer.
Rolls Royce plc Nightingale Rd, Derby	Acid	Oxides of nitrogen, volatile organic compounds	---	---
Rolls Royce & Assoc. Ltd Raynerway, Derby	Acid	Particulates, oxides of nitrogen	---	---
RMC Industrial Minerals Ltd, Buxton	Lime	Particulates, oxides of sulphur, oxides of nitrogen	---	Replacement of existing kilns and installation of new abatement equipment to reduce releases of particulates to air.
SAPA Ltd, Tibshelf	Non-ferrous metals	Particulates, oxides of nitrogen	---	---
Tioxide Europe Ltd, Derby	Acid	Particulates, oxides of nitrogen	---	---

5 Uses, Activities and Pressures

Table 4 - Most significant pollutants released from Part A processes in 1995

Pollutant	Quantity (Tonnes)
To Air:	
Carbon monoxide	7,247
Carbon dioxide	1,817,506
Sulphur dioxide	3,118
Oxides of nitrogen (as nitrogen dioxide)	2,174
Particulate matter	2,114
Volatile organic compounds	521
To Water: (controlled waters and sewer)	
Cadmium	0.35
Mercury	0.035
Other heavy metals (lead, antimony, chromium and nickel)	0.075
Phosphates	0.28

Local perspective

Within the Derwent catchment the Agency regulates 2 nuclear installations and 3 separate disposal authorisations (see map 8) as well as some 60 closed source registrations.

Those premises authorised to dispose of radioactive materials are the 2 nuclear installations operated by Rolls Royce, Derby City General Hospital, Derbyshire Royal Infirmary and Derbyshire University, all of which are in Derby. The authorisations for these premises permit the controlled release of radioactivity to air, sewer and land as well as for off-site incineration. Some low level waste from Rolls Royce is disposed of to land at Crich near Matlock. Within the plan area there are no facilities authorised to incinerate low level radioactive wastes, this material is transported by road to sites outside the catchment for authorised disposal.

5.2.3 Power generation

General

An essential part of the Government's environmental strategy is the reduction of emissions produced as a result of burning fossil fuels. The Government's policy is to encourage the exploitation and development of renewable energy sources wherever they have prospects of being economically attractive and environmentally acceptable. The Agency is keen to support this policy through the application of its powers and duties.

Renewable energy sources include water (hydropower, wave and tidal), wind solar and geothermal power and energy derived from waste treatment. Some renewable energy sources, such as hydropower are commencing widespread commercial exploitation. Information about planning aspects of renewable energy is available in the Planning Policy Guidance Note on Renewable Energy (PPG 22 issued by the Department of the Environment, Transport and the Regions).

The United Kingdom uses fossil fuels, coal, oil and natural gas as sources of energy for the production of power. Those processes capable of achieving a rated thermal input of 50 mega watts (MW) or more are regulated by the Agency. The principal environmental impact from the combustion of fossil fuels is that of releases of gases to the atmosphere. Such releases affect the quality of the air both locally and globally.

The burning of coal is estimated to contribute about 34% of the carbon dioxide released into the atmosphere

5 Uses, Activities and Pressures

each year by the UK, the vast majority via power stations. The burning of gas is now estimated to account for some 24 %.

Burning fossil fuel also releases other gases into the atmosphere, particularly oxides of nitrogen, sulphur dioxide and particulate matter.

Local Perspective

The new power station operated by Derwent Cogeneration Ltd at the Courtaulds site in Spondon, Derby, is a gas fired combined heat and power plant. It comprises 4 gas turbines and one waste heat boiler and is capable of generating a total of 216MW of electricity. The plant was commissioned in 1995 and replaced the coal fired power station.

5.3 Waste management

General

Waste Regulation

The treatment (including recovery), keeping and disposal of controlled waste is regulated by the Agency through the waste management licensing system, under the Environmental Protection Act 1990. Controlled waste consists of household, industrial and commercial waste.

Agricultural waste, mines and quarry waste and sewage sludge are covered by other legislation.

Different types of waste management facilities include, landfill sites, transfer stations, household waste and recycling sites, treatment plants, incinerators, scrap yards and recycling process plants. Planning permission will normally be required for the development of a waste management facility. The siting of waste management facilities is decided through the land use planning system by LPAs under the Town and Country Planning Act 1990. Some sites are exempt from licensing and these mainly cover re-use and recovery operations such as recycling facilities.

The objective of the waste management licensing system is to provide a separate control system that ensures that waste management facilities:-

- do not cause pollution of the environment,
- do not cause harm to human health,
- do not become seriously detrimental to the amenities of the locality (only applicable if planning is not in force).

In assessing pollution, waste regulation should have regard to the wider environment. They should consider the impacts of emissions on global climate change and on local air, water, soil, flora and fauna.

Waste Arising - Public Sector

Waste disposal authorities (usually county, metropolitan or unitary) have a duty to arrange for the disposal of household waste in its area. Local Authorities are also required to provide household waste and recycling sites where members of the public can deposit waste free of charge.

The way that waste materials are collected and sorted often dictates which waste management option is subsequently used, and whether materials recycling, biological treatment or energy recovery are economically feasible. The collection method will significantly influence the quality of recovered material or value.

Waste Arising - Private Sector

The first priority for more sustainable waste management is to reduce the production of waste from all industrial

5 Uses, Activities and Pressures

processes. The manufacturing industry is in the best position to play a major role in developing the techniques for reducing resource use and ensuring that end of life products are reusable or recoverable.

Landfill Tax

On 1 October 1996 a tax was introduced on the disposal of waste in landfill sites throughout the United Kingdom. The aims of the new tax are two fold. First, it will make sure that, as far as practicable, the cost of landfill properly reflects the impact which it has upon the environment. Second, it will help to achieve the targets for more sustainable waste management set out in the Government's White Paper, "Making Waste Work", by providing a fiscal incentive to reduce waste production, dispose of less waste to landfill and recover more value from waste that is produced.

The Government has decided that some of the tax that is raised can be used to support the environmental aims of the tax by allowing a credit of landfill tax to operators of landfill sites who make contributions to approved bodies for spending on certain environmental objectives. As only landfill site operators pay the tax, only they can claim a credit for contributions to environmental bodies.

Environmental bodies are non-profit distributing, private sector organisations which will fund a range of approved environmental regeneration schemes and promote sustainable waste management practices. Typical projects which would qualify are:-

- Reclamation of old landfill sites for new community uses, eg nature reserves.
- Creation of new community amenity resources in the vicinity of landfill sites, eg safe play areas for children, educational conservation areas or landscape improvements.
- School based education programmes raising awareness of waste and its management.
- Research and development of more sustainable waste management practices.
- Promoting and distributing information to business on waste management.

Landfill operators will be able to publicise their support for approved projects - by erecting signs or through recognition on literature. However, projects must be able to demonstrate real community benefit or benefit to the waste industry generally.

Direct benefit to individual landfill operators is excluded, eg landscape improvements to existing operating landfill sites or closed sites covered by formal restoration conditions.

Local Perspectives

Waste Management Facilities

There are 49 licensed waste management facilities in the area, shown on Map 9, of which 25 are licensed landfill sites. Other facilities include transfer stations, treatment plants and metal recycling sites.

Exempt Activities

Currently there are 61 registered exemptions for metal recycling facilities and 223 registered exemptions for other general exempt facilities in Derbyshire. These other exemptions include the use of waste soil for land reclamation or construction purposes, the storage of waste in a secure place and recycling banks (such as paper, cardboard, glass and oil).

Land Application of Wastes

In 1996/97, over 170 prenotifications for landspreading waste were received in Derbyshire, which accounted for well over 30,000 tonnes of controlled wastes consisting of food drink processing waste, farm and abattoir sludge and paper sludge (see Issue 11).

Unauthorised deposits

Illegal activities are not uncommon and take the form of flytipping waste, operating a site without a licence or

ENVIRONMENT
AGENCY

5 Uses, Activities and Pressures

not complying with licence conditions. During 1996/97 investigations were carried out into over 60 incidents involving alleged illegal tipping activity in Derbyshire.

5.4 Contaminated land

General

The Agency is aware of a variety of potentially contaminated sites within the Region. These include closed landfills, old gasworks and a wide range of industrial sites, many of which are located in environmentally sensitive locations such as near to rivers or on aquifers. The positioning of sites close to water bodies or on aquifers is a historic relic of the need for water in the industrial process, as a method of transport for raw materials and products, and the location of centres of population.

As part of the Agency response to planning applications, we will often request that a site investigation (SI) is undertaken prior to redevelopment and that remedial works are undertaken should the SI indicate that they are required.

Various techniques are available for the clean up of contaminated land. Traditionally, excavation of contaminated material and disposal to a licensed landfill site has been the most commonly chosen method of remediation. The removal of any contaminated materials from a site should only be undertaken by a registered carrier who follows a 'Duty of Care' under the Environmental Protection Act 1990. The Agency will consider all alternative technologies which are capable of cleaning a site to an acceptable standard. Where these methods represent a better environmental option to the "disposal" option, the Agency will encourage their use. The "suitable for use" principal is in relation to site remediation. Much liaison between Local Authorities and private concerns is taken place with the Agency. This is to ensure that any elements of contamination within such soils that are reused or disposed of, are acceptable so as not to harm the environment or cause any danger to human health.

Where land is not subject to a planning application, but is known to be contaminated and is having an impact on the quality of controlled waters, the Agency will encourage the polluter/owner to undertake remedial works. Where pollution has occurred, the Agency encourages operators to inform the Agency, so that agreed remedial action can be taken, based on the environmental risk at the site. Where operators do not inform the Agency and subsequently pollution of controlled waters is detected, prosecution under Section 85 of the Water Resources Act 1991 will be considered or remedial work can be required under Section 161 of the Act.

Existing contaminated land sites offer, once suitably remediated, an opportunity for redevelopment. It is often preferable to redevelop a contaminated site with less contaminating end uses and therefore a lower threat of pollution to water resources.

Of the estimated 100,000 contaminated land sites throughout the UK, many will require some sort of remediation to make them suitable for a specific use or to eliminate a specific significant hazard to human health, the environment, or buildings. A significant number are believed to be located in the Midlands Region. Under the Environmental Protection Act 1990 and the Environment Act 1995, the Agency will have the primary responsibility for, and a number of duties to manage, "Special (contaminated land) Sites".

The Regulations and Statutory Guidance associated with the above Acts are only in draft form at present. The main responsibility for identifying contaminated land and ensuring its remediation, will be with Local Authorities. The Agency will have a significant role in providing advice, liaising and consultation with, Local Authorities carrying out these duties. We will only have the primary role with the 'Special' sites, as defined in the Guidance, which are most seriously contaminated.

Local Authorities and the Agency, where appropriate, will have the power to issue 'Remediation Notices', to require adequate clean up of contaminated sites.

The General Development Procedures Order 1995 requires the Local Planning Authority to consult with the Agency on any planning application for development on or within 250 metres of land which:-

5 Uses, Activities and Pressures

*"(1) is or has at any time in the 30 years before the relevant application been used for the deposit of refuse or waste and
(2) has been notified to the local planning authority by the Waste Regulation Authority for the purposes of this provision".*

The Agency is required to locate these old waste disposal sites and notify the Planning Authority. In many cases little information is available on the state of contaminated sites. Licensed waste management sites are subject to inspection and investigation by the Agency but there are no powers with regard to former unlicensed sites. The Agency will have powers in the future, to inspect and under certain circumstances, require remedial action to be taken on such sites which have been notified to us by the Local Authority as a 'Special Site'.

Local Perspective

There are not considered to be a significant number of potential "Special Sites" in this plan area, on the basis of information currently available to the Agency.

Contaminated land is not a serious problem in the plan area. Former industrial areas in the main urban areas can be contaminated. Appropriate remedial action where sites are causing problems is required by the Agency, usually during redevelopment. Former landfills in Derbyshire have been identified as potential problems (see Issue 10)

5.5 Mineral Working

General

Current or former mineral workings can pose a threat to ground and surface waters by exposing polluting spoil or veins of potentially polluting minerals to the weathering process. As a result, runoff and discharges from quarries and mines can contain contamination and suspended material that is harmful to aquatic life. Discharges from active sites are subject to normal discharge consent procedures. However, discharges from abandoned mines are not adequately controlled by law and may cause locally severe problems.

The exploitation of minerals can have a major impact on water resources by altering groundwater flows and hence streamflows. The removal of material from above the water table reduces the opportunity for natural filtering and attenuation of pollutants, which will consequently enter the groundwater more readily. The dewatering of mineral workings is exempt from the need for an abstraction licence but a conservation notice may be needed to minimise the impact of such operations on the water environment. Reclamation with impermeable material will increase runoff and reduce the recharge of groundwaters, whilst the use of mineral extraction sites for landfill can also threaten groundwater quality and is not encouraged by the Agency in all locations.

Gravel extraction may take place from the river channel or floodplain and is controlled by planning law. It may also require a land drainage consent and a discharge consent from the Agency. If extraction works are not properly managed, the river channel can be seriously damaged. There can also be serious implications for fish spawning sites.

All mineral workings are subject to general planning controls. The Agency is a consultee on such applications, and the final planning consent should contain conditions which control the operations in order to satisfy the Agency's requirements. Both the impact of the mineral working and its restoration need to be considered.

Local Perspective

There are extensive mineral workings within the plan area which are of national importance and essential for meeting the local and regional community needs. These include limestone, coal, clay, brickclay, sandstone and sand and gravel. The area is a net exporter of minerals and mineral related products.

The South Derbyshire coalfield crosses the area. There are no active deep mines but opencast sites remain.

5 Uses, Activities and Pressures

The clay deposits of Carboniferous Coal Measures and Mercia Mudstones are extracted in the east of the plan area.

Sand and gravel workings can be found along the River Derwent particularly in the south of the plan area.

The major mineral extracted is limestone with extensive quarries particularly in the Buxton area. These quarries have many years of reserves left and are creating huge voids in the Derbyshire countryside. Due to the extremely high groundwater vulnerability there is a policy of objecting to restoring limestone quarries using potentially polluting wastes (see Issue 9).

Igneous rock is extracted at Waterswallows near Buxton and other locations.

Fluorspar and other minerals are quarried on a small scale throughout the Peak District from linear deposits known as rakes.

5.6 Agriculture

General

Agriculture is the major land user in the UK, and its environmental effects are very significant. Increased food production since the Second World War has had a substantial effect on the rural environment and the appearance of the countryside. The high level of agricultural support under the Common Agricultural Policy (CAP) has stimulated the intensification of production, with consequent adverse effects on the environment. These include additional habitat loss and problems of water pollution in some areas, particularly from nitrates and farm wastes. The 1992 CAP reform package marked an important change of emphasis, with a reduction in EC support prices and a new requirement on all member states to introduce measures to encourage environmentally friendly farming. The full effects of these reforms are still to be seen.

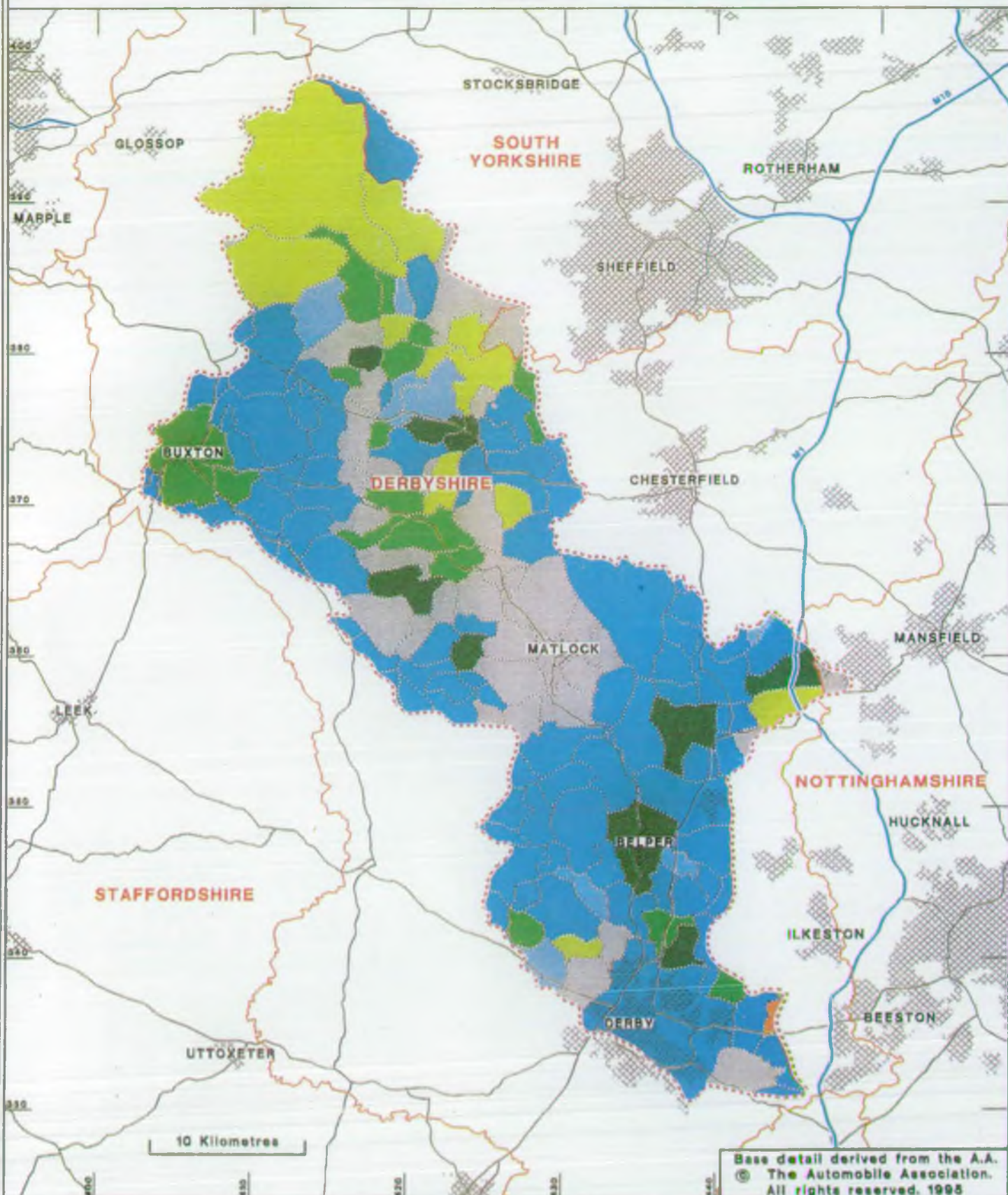
The Ministry of Agriculture Fisheries and Food (MAFF), works directly with the agricultural community to control pollution and to promote conservation. MAFF policy is to minimise pollution from agricultural activities by raising awareness and encouraging good agricultural practice. Free and confidential advice on pollution prevention is available from the Farming and Rural Conservation Agency (FRCA) and the Ministry has produced good practice guidance for farmers for the protection of water, soil and air.

In the arena of nature conservation, the Countryside Stewardship Scheme can provide payments to farmers to change land management practices that promote the creation and maintenance of threatened habitats and can allow improved public access. The scheme also promotes the creation of buffer-strips along designated watercourses to reduce agricultural related pollution particularly from nitrates and phosphates.

Legislation, grants and advice are all important factors in reducing the adverse impact of agriculture on the environment and the Agency working with MAFF, and the FRCA, has an important role in this process. Examples of Agency work include:-

- Enforcement of the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991, which set down minimum standards for the design and construction of agricultural storage systems. In addition the Agency has a duty to regulate the abstraction of water for agricultural use.
- Farm visits both to identify sources of pollution and to offer advice to farmers.
- Promotion of initiatives such as MAFF's "The Code of Good Agricultural Practice for the Protection of Water and Farm Waste Management Plans".
- Working alongside MAFF to promote conservation through the Countryside Stewardship Scheme and the Habitat scheme.

DOMINANT FARM TYPE BY PARISH (1995) DERWENT LOCAL ENVIRONMENT AGENCY PLAN



FARM TYPE

- | | |
|-----------------------|-----------------------------------------|
| Specialist Dairy | Cropping: Mostly Cereals |
| Mainly Dairy | General Cropping |
| Mostly Cattle | Predominantly Vegetables |
| Mostly Sheep | Predominantly Fruit |
| Cattle & Sheep | General Horticulture |
| Predominantly Poultry | Mixed |
| Pigs & Poultry | No Agricultural Data or Data Suppressed |

Based on 1995 parish summaries

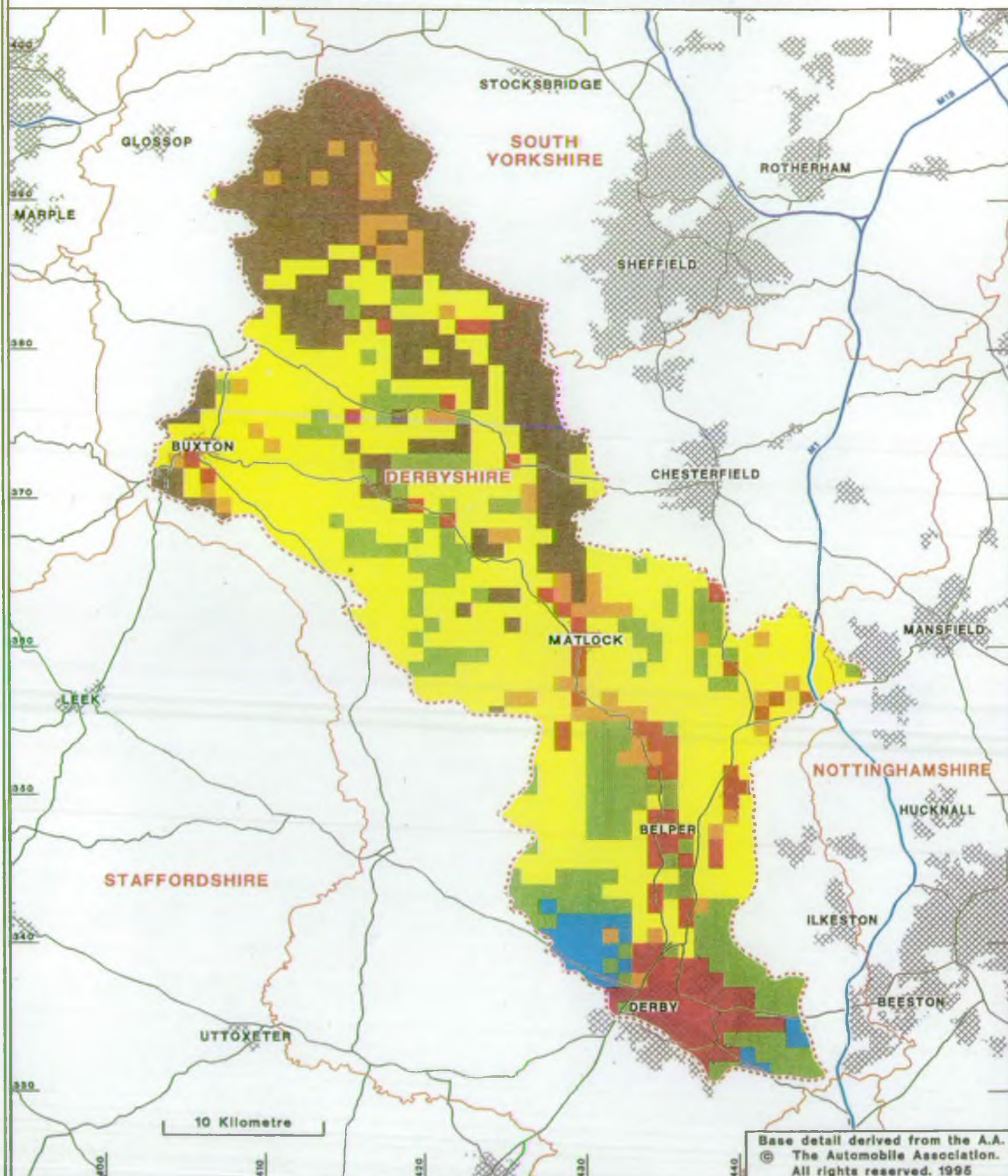
Base detail derived from the A.A.
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Map produced by
Resource Planning Team,
Farming and Rural
Conservation Agency - Leeds.
Telephone - 0113 261 3333

FRCA

on behalf of MAFF
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AGRICULTURAL LAND CLASSIFICATION DERWENT LOCAL ENVIRONMENT AGENCY PLAN



Agricultural Land

- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5

Non-Agricultural Land

- Land predominantly in urban use
- Other land primarily in non-agricultural use

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5 Uses, Activities and Pressures

Local Perspective

Over 80% of the land in the Derbyshire Derwent plan area is in agricultural use. A figure which is similar to the national average. Owner occupied land has increased by 9% to 63%.

The agricultural land is predominantly grassland which accounts for 83% of the farmed area. Grassland has shown an overall decline of 1% over the last 10 years.

The Derwent Valley is mainly a livestock area, dominated by dairying, even though cow numbers have declined by 16% following the introduction of milk quotas in 1984. This decline has been offset, however, by an almost doubling of the beef herd and by significant increases in the numbers of ewes and lambs, and other sheep. There may however be changes to these figures following the bad publicity that beef has received during the BSE outbreak, and furthermore by recent Government statements recommending reductions in red meat intake. The dominant farm type for the plan area is shown on Map 10.

The agricultural workforce, consistent with the national trend, has seen a shift from full time to part time holdings. There are approximately 1886 holdings in the plan area of which 59% are part time. The trends also show a decline of 6% in agricultural workforce.

In terms of land quality, as graded by MAFF (see Map 11), 30% of the Derwent area is of grades 1, 2 and 3, compared with a national average of 60%. Very good quality grade 2 land is located in the vicinity of Derby. Grade 3 quality land is distributed throughout the lower and middle reaches of the Derwent Valley. Poorer quality grade 4 land is situated predominantly in the limestone and coalfield areas of the plan area. The poorest land quality is grade 5 which dominates the northern parts of the plan area and reflects that moorland is the dominant land cover. The pattern of livestock is generally that cattle occupy the better quality land and sheep are restricted to the poorer quality land in the north of the plan area.

5.7 Sewage and industrial effluent disposal

General

All discharges of sewage effluent and industrial effluent to rivers and canals require a consent or authorisation from the Agency. Continued investment to improve sewerage systems and sewage treatment is required to ensure that discharges are within the capacity of the watercourse to accept them without damage to the aquatic environment.

Consents or authorisations to discharge to a watercourse set limits on the quality and volume of the effluent that can be discharged. These limits are set in accordance with two factors:-

- i) The quality and quantity of the water at the point of discharge, ensuring that the effluent does not cause significant deterioration in watercourse quality.
- ii) The downstream uses of the receiving waters, ensuring that the discharge does not compromise such uses and does not breach relevant water quality standards, some of which are statutory.

Investment in the sewerage infrastructure and sewage treatment has led to a marked improvement in water quality in recent years.

Local Perspective

Sewage effluent disposal

The majority of the domestic sewage generated in the catchment is treated at sewage treatment plants (STPs), owned and operated by the local water undertaker, Severn Trent Water Ltd. There are also numerous small private STPs serving single dwellings. These normally take the form of septic tanks with the effluent disposal route being to a properly constructed soakaway. There are also a number of direct discharges from small privately owned STPs serving public houses, hotels, activity centres and small businesses.

**Derbyshire Derwent
Local Environment
Agency Plan
Map 12**



**ENVIRONMENT
AGENCY**



0 10km



**Major sewage and industrial
effluent discharges**

KEY

- LEAP area
- Watercourse
- Canal
- Built up area
- Sewage effluent
- Industrial effluent
- Water quality sub-catchment

5 Uses, Activities and Pressures

Severn Trent Water Ltd operates 42 STPs in the plan area (see Map 12). These vary in size from small septic tank installations serving 2 or 3 properties, such as Flagg, through to variously sized treatment works serving villages such as Foolow, and towns such as Matlock, Ripley and Alfreton, to the large scale works at Spondon serving the Derby conurbation.

Most STPs discharge treated effluent directly to the river Derwent or its tributaries. A small number serving villages in the Carboniferous Limestone area, however, discharge treated effluent to the underground strata.

Approximately 180 megalitres of sewage is collected daily by the water company for treatment, over half of this is treated at the Spondon STP. The majority of the remainder is treated at STPs discharging to the River Amber system. These drains the urban areas of Ripley, Alfreton, Clay Cross, and parts of Sutton-in-Ashfield via the Hartshay, Press and Alfreton Brooks. Treated sewage forms a high proportion of the daily dry weather flow. This tends to make the water quality of the River Amber and the River Derwent downstream of the confluence slightly inferior when compared to the River Derwent upstream of Ambergate. Generally the effluents from STPs serving towns and villages upstream of Ambergate, such as Matlock, Bakewell and Hathersage are able to take advantage of the higher variation in flows in the river. The effluent from Buxton STP is however discharged to the headwaters of the River Wye. The water quality immediately downstream of this discharge is therefore significantly affected but improves along the downstream stretch by both natural self-purification processes and further dilution. The water quality returns to a good standard through Millers Dale, Monsal Dale, and Ashford-in-the-Water.

The Derby STP is by far the largest in the catchment. Although the works produce a good quality effluent it nevertheless contributes a substantial organic and nutrient load to the river system. This combined with low summer flows, enhanced river temperatures brought about by industrial cooling and the effects of photosynthetic activity, results in the classic diurnal variation in the dissolved oxygen level, pH and un-ionised ammonia, which in turn can cause fish mortality. The river downstream of Derby supports a good quality coarse fishery, however fish are under considerable stress during nights in June/July when the dissolved oxygen levels can dip to 35% saturation. Under these circumstances, any abnormal addition of organic load can lead to fish deaths (see Issue 4).

Industrial Effluents

Although a number of the industries in the area discharge trade effluent to the local sewerage systems for treatment at the STPs, a number of large industrial effluents are discharged direct to the river system.

These include effluents from the limestone, and sand and gravel quarrying from ex-coliery sites, treated dye effluent from Drabbles on the Bentley brook, and Stevenson's (dyers) on the River Amber, treated process waters from the metal recycling process at Darley Dale, and large quantities of cooling water from, for example Courtaulds Chemicals, Spondon.

5.8 Water resources and abstraction

General

The natural flow regime of a river can be affected by the use of water in terms of:-

- Abstractions
- Discharges
- Reservoirs and impoundments
- Land use changes.

Abstractions reduce the quantity of water in rivers and streams. Discharges increase the flow. Reservoirs and impoundments and land use changes affect the river flow and levels in a more complex manner.

The effects of reservoirs on river flows can be complex. Where a reservoir or impoundment is used for water power, a head may be built up to generate electricity over a short period. This has the effect of cutting down the flow in the river while the reservoir fills, then increasing flow during generation.

5 Uses, Activities and Pressures

Surface water flows to watercourses are affected by increased development in the catchment. Urban development increases the quantity of run-off and decreases the amount of rainwater which is absorbed into the ground. The time taken for the rain to reach watercourses is reduced, particularly where the developed area is sewered direct to the watercourse system. These aspects affect the flow regime in a catchment often leading to increased flood peak flows and reduced base flows. Through liaison with Planning Authorities, the Agency seeks to ensure that the adverse effects of development on the flow regime of the catchment's watercourses are minimised.

The Agency has analysed information on water use and has prepared a Regional Water Resource Strategy. Forecasts of future demands will be reviewed to try and anticipate needs for water resources and to consider ways of meeting those future demands.

The removal of water from streams, rivers and groundwaters (abstraction) to meet human needs are controlled by licences granted under the Water Resources Act 1991. Licences are issued by the Agency and it has statutory duties under Section 19 of the Act to:-

- Conserve, redistribute or otherwise augment water resources in England and Wales.
- Secure the proper use of water resources in England and Wales.

Under the Environment Act 1995 the Agency has general duties relating to the conservation and enhancement of natural beauty and amenity of inland and coastal waters and land associated with such waters, the conservation of flora and fauna dependant on the aquatic environment and the use of waters for recreation which are without prejudice to its water resources duties.

The Agency is therefore developing a sustainable water resources strategy that seeks to:-

- Optimise the use of existing water resources.
- Ensure that water demands are met in an environmentally acceptable manner.
- Protect current resources and future reserves from threat.
- Ensure that the use of water does not exceed that which can be replaced or recovered.
- Ensure that water resource users are considered in an equitable manner while recognising the special needs of public.

In order to balance demand with resources, the Agency supports demand management including measures to control demand for water through conservation and metering.

All abstraction licences specify maximum volumes that the licence holder may take, and many contain conditions to protect the environment and other abstractors. The exceptions are licences granted as Licences of Right in 1965, or "Licences of Entitlement" in 1990 where the legislation did not permit the former NRA and its predecessors to restrict pre-existing abstractions. In considering applications for new licences, the Agency must ensure that there is no derogation of existing abstractors without their agreement, and that the aquatic environment and associated habitats are properly safeguarded. The Agency does not guarantee that the authorised volume will be available, nor that water will be fit for the purpose for which it will be used.

Exemptions to the requirement for licensing includes private supplies to a single household of less than 20 cubic metres a day. There are also a number of specific types of abstraction, eg fire fighting, which are exempt from the need for a licence.

Public water supplies are provided by private water companies (water undertakers). The Agency's responsibilities and duties do not relieve any water undertaker of the obligation to develop water resources as part of its general duty to maintain the water supply system.

Private water supplies are generally derived from springs, wells and boreholes, their quality is monitored by the Environmental Health department of the Local Authority. The Agency does not guarantee the quality of the raw water or of the treated water. However, it does have a duty to protect water quality and specifies protection zones around groundwater sources to seek control over certain potentially polluting activities. The Policy and Practice for Protection of Groundwater forms the basis for the Agency's activities in this area.

5 Uses, Activities and Pressures

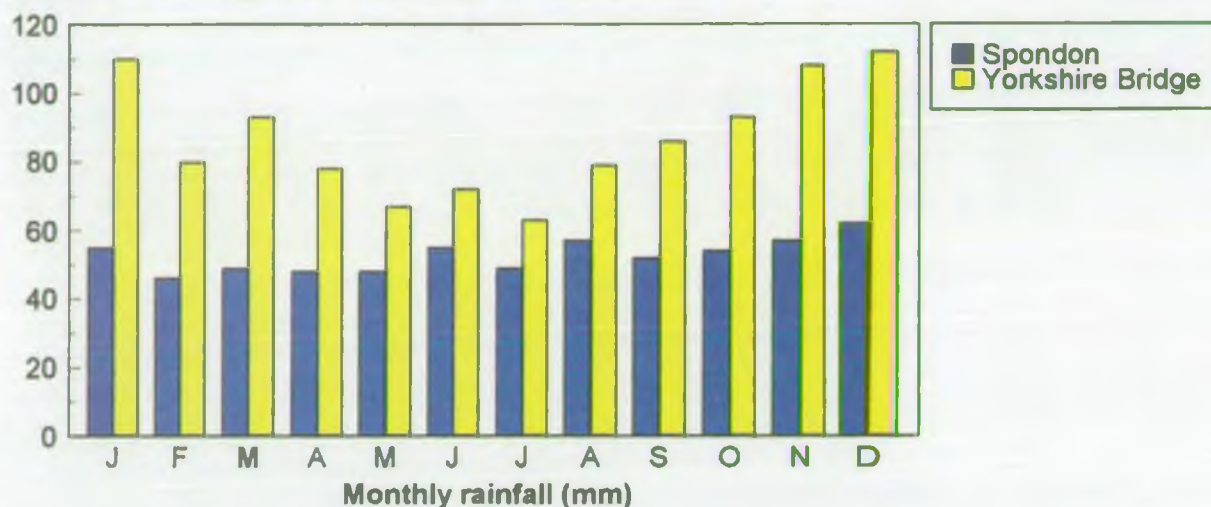
The use of water from rivers and other surface waters is restricted in dry summer months when flows fall below agreed thresholds. These thresholds are part of the licences that are granted and are linked to an appropriate control point.

Local perspective - Hydrology and Hydrometrics

Hydrology

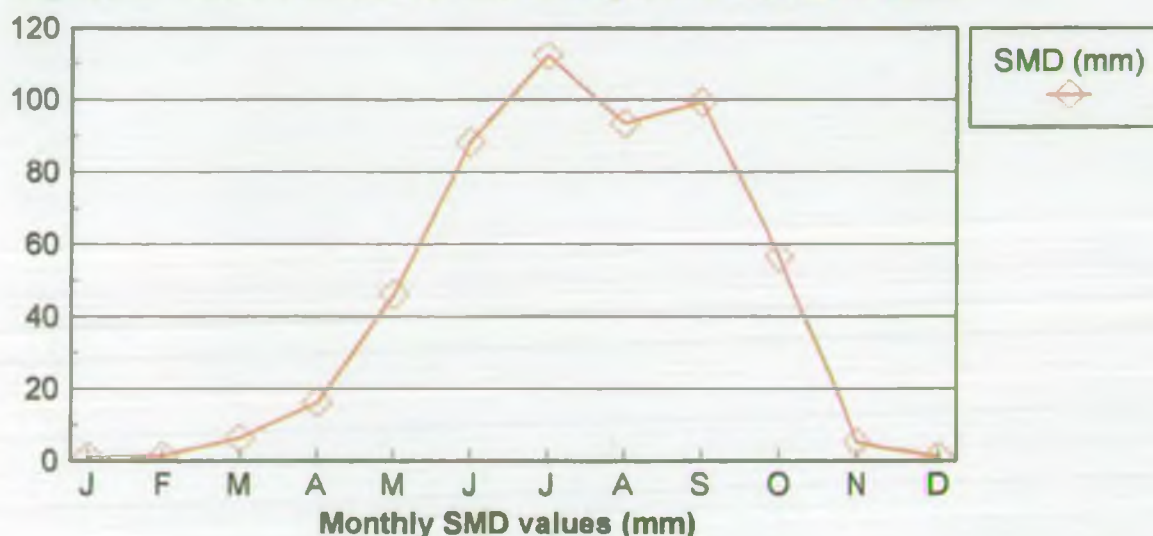
The average annual rainfall for the plan area, as shown in Map 2, varies from less than 650mm in Derby to over 1,040mm around Ladybower Reservoir. Rainfall is measured in the area by a network of over 40 rainfall gauges read daily by voluntary observers. At 7 of these sites rainfall intensity is measured and automatically read by telemetry. These gauges form part of the Agency's national rainfall measurement network.

Figure 1 - Long Term Average Rainfall 1961-90



The pattern of rainfall throughout the year is shown in Figure 1 for the rain gauges at Yorkshire Bridge, Bamford (NGR SK 4198 3853) and Spondon STP, Derby (NGR SK 4389 3350). The highest and lowest monthly recorded totals are also given to illustrate the range of monthly totals that can be expected. The data shows that the rainfall distribution at Spondon STP is fairly consistent over a year. By contrast rainfall at Yorkshire Bridge demonstrates greater variability with peaks in the months of November, December and January.

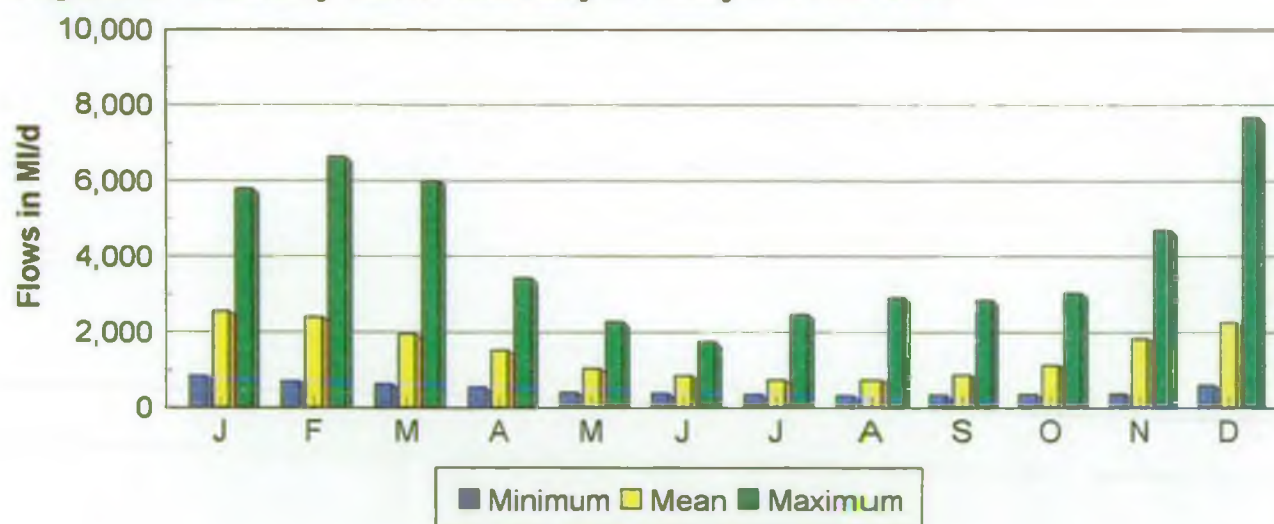
Figure 2 - SMD values for the Derbyshire Derwent 1996



5 Uses, Activities and Pressures

The effect of this rainfall varies with its intensity and the state of the catchment. Soil moisture deficit (SMD) is a measure of the 'dryness' of the soil and is expressed as the amount of rain (millimetres) required to bring the soil to a saturated state. Figure 2 shows the typical seasonal changes in SMD in the area brought about by weather conditions and evapotranspiration by plants. The SMD is generally higher in summer and low in winter but where summer rainfall occurs on thin upland soils then the SMD can be reduced to zero. Under the saturated winter conditions water drains from the soil and recharges the groundwater, raising the water table.

Figure 3 - Monthly flows at Derby St Mary's 1936-1996



Rainfall, SMD and groundwater levels contribute to the natural variability of the flow in a river. This seasonal variability is demonstrated by Figure 3 which shows the flows in the River Derwent measured at St Mary's Bridge flow gauging in Derby (NGR SK 355 368). As expected the peak flows are recorded in the winter months. Maximum and minimum monthly averages are also shown to demonstrate the very large range in flows.

Hydrometry

To support the Agency in carrying out its water resource management function it is essential to collect data on the various aspects of the hydrological cycle. Agency water resources staff routinely monitor rainfall depths and intensity, surface water levels, river flow and groundwater levels. The science of this data collection and management is called hydrometry. The area is served by a network of hydrometric installations, the location of which is shown in Map 13, or refer to the Hydrometry Data book, published by the Agency.

As well as supporting the water resources function the hydrometric data is used by other Agency functions for flood warning, design of flood defences, setting water quality standards for rivers and groundwater and to protect and help improve fisheries.

The River Derwent is perhaps one of the most highly managed rivers in the country. The conflicting needs of the environment, reservoirs, abstraction and amenity mean that river flow and levels need to be constantly monitored.

The behaviour of groundwater within the plan area's aquifers is also complex and there is therefore a corresponding requirement for a high degree of groundwater level measurement.

Customer needs for hydrometric data is regularly reviewed and the network adapted to meet those requirements.

Local perspective - abstraction licensing

Public Water Supply (Drinking Water)

Severn Trent Water Ltd are the only water company abstracting water for public water supply (PWS) in the plan area (see Map 14). In addition to Derbyshire, water abstracted from the plan area supplies parts of

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SK

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Derbyshire Derwent
Local Environment
Agency Plan
Map 13



ENVIRONMENT
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**Derbyshire Derwent
Local Environment
Agency Plan
Map 14**



**ENVIRONMENT
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0 10km



**Surface and groundwater
abstractions (>1Ml/d)**

KEY

- LEAP area
- Watercourse
- Canal
- Built up area
- <10 Ml/d
- 10 - 50 Ml/d
- >50 Ml/d

Surface water

- Hydropower
- Public water supply
- Industrial
- Other

Groundwater

- Hydropower
- Public water supply
- Industrial
- Other

5 Uses, Activities and Pressures

Nottinghamshire and Leicestershire via the Derwent Valley Aqueduct. Water is also supplied to Yorkshire Water Ltd via a tunnel transfer from Bamford to Rivelin. Only about half of the water abstracted for PWS remains within the plan area.

The majority of PWS abstraction is from the river, or surface water, system. There are three major reservoirs at the head of the River Derwent (Derwent, Howden and Ladybower) which provide combined storage of 46,419Ml. The other major reservoir is Ogston, on the River Amber, with a storage capacity of 6,087Ml. In addition to the reservoir schemes there are direct river abstractions at Little Eaton and Draycott. Water is abstracted from the River Derwent at Ambergate, primarily to fill Carsington reservoir (in the River Dove catchment), but also to supply water to Ogston reservoir.

Water may be released from Carsington Reservoir to augment flows in the River Derwent during summer low flows. This allows Severn Trent Water Ltd to maintain river flows at the flow gauging station at Derby St Mary's. All of the direct river abstraction PWS licences are conditioned so that abstraction must cease when flow at the gauging stations falls below prescribed levels, thus maintenance of the minimum flow is essential to Severn Trent Water Ltd's abstraction network in this plan area.

In addition to the major surface water abstractions there are 4 groundwater abstractions for PWS purposes. There is also a major abstraction from Meerbrook Sough, a lead-mine drainage sough constructed in the late 18th century to drain the lead mines under the Wirksworth area. Water is derived from both Millstone Grit and Carboniferous Limestone Aquifers. The source is classified as surface water as the abstraction itself has no bearing on aquifer water levels, although the sough does affect drainage rates and groundwater flow direction within the aquifers.

In order to maintain flows in the upper reaches of the rivers Derwent and Amber, below the large reservoirs, there is a requirement for compensation water to be released into the rivers from Ladybower reservoir and Ogston reservoir respectively.

Industry

Water is abstracted across the whole plan area and for a wide variety of uses. In volumetric terms, by far the largest abstractions are from the River Derwent at Derby by Courtaulds Chemicals and Derwent Cogeneration. A large proportion of both abstractions are returned to the river.

Other main industrial surface water abstractions are concentrated between Bamford and Belper, from the Rivers Derwent, Wye, Amber and Ecclesbourne.

Industrial uses make up a large majority of groundwater abstraction in the area. Abstraction is concentrated in the north west of the area, from the Carboniferous Limestone aquifer. Mineral processing is the major use. In the south-east of the area, there is some abstraction from sand and gravel deposits for mineral washing.

The extraction of aggregates below the water table invariably necessitates dewatering operations. The water pumped out of the working represents a loss of groundwater resources and only where there is a low flow problem in the receiving watercourse does any benefit accrue. As well as disrupting the natural groundwater and surface water flow patterns, badly planned dewatering operations can result in instances of desiccation of adjacent wetland sites, which are dependent on a high water table. The operations can also adversely affect water supplies from wells, boreholes and springs. Ideally the pumped water should be returned to the underground strata close to the workings.

In the plan area such activities are widespread, especially where limestone and sand and gravels are extracted. In some instances, particularly in limestone areas, for economic reasons the pumped water may be discharged into a neighbouring catchment instead of being retained in the catchment containing the excavation. This results in a loss of resources in the plan area as a whole, not just groundwater. Waters draining from the limestone area are normally good quality and are essential to ensure the good health of the river system. It is anticipated that future limestone quarrying will be undertaken at greater depths, and massive dewatering may be required.

As far as restoration is concerned the use of some impermeable material as infill below the water table can, if not properly planned, cause localised impediment to groundwater flow resulting in drainage problems.

5 Uses, Activities and Pressures

The Environment Act 1995 introduced new requirements for an initial review and updating of old mineral planning permissions and the periodic review of all mineral permissions thereafter. This came into force on 1 November 1995 to ensure that conditions attached to mineral permissions do not become out of date with respect to effects on the environment.

Hydropower

The rivers in the area, especially the Derwent, have been used to generate power to operate the many industries along their length since probably Roman times. Between 1750 and 1850 major weirs were constructed along the River Derwent and the Derwent Valley obtained a reputation as the cradle of the Industrial revolution.

Today many mills have fallen into disuse and disrepair, but several of the weirs and their associated goits and channels have been adapted to generate electricity on a commercial basis as hydropower schemes, often generating electricity for the National Grid under the Government's Non Fossil Fuel Obligation (NFFO) scheme. Although all water abstracted for the purposes of hydropower is returned to the source of supply, the major schemes have complex operating arrangements which can have the potential to create flow problems in the river. Where this is the case the Agency will require the site operators to enter into a legal agreement under section 158 of the Water Resources Act 1991 setting out operating rules. These rules seek to ensure that abstraction for power generation does not cause flows to be adversely effected to the detriment of the environment and other licensed users downstream. These agreements are reviewed on a regular basis.

Private Water Supply (Drinking Water)

There are a small number of private water undertakings in the area, mostly in rural areas north of Derby where mains water supplies are not present. The two most significant schemes are at Chatsworth and Youlgrave.

Agriculture

Licences to abstract for agricultural purposes account for over 50% of the total number of licences in the area, however they account for only a tiny fraction of the overall licensed quantity. The vast majority authorise abstractions for agricultural purposes other than spray irrigation from groundwater sources. This reflects the rural nature of the upper part of the area, north of Derby, and the lack of public water supply to remote farms. There are a very small number of spray irrigation licences from both surface water and groundwater sources.

Other abstractions

There are a number of licences not falling into the above categories. Notably there are several licences authorising abstraction for fish farms across the whole area.

5.9 Flood water storage and flood defence

General

The river network carries surplus water from land to the sea as part of the hydrological cycle. Natural watercourses have limited capacity and when this is exceeded, flooding of the adjoining land (floodplain) occurs.

Normally flooding is the result of prolonged rainfall or rapid snowmelt. The severity of a flood is generally described in terms of its frequency of occurrence. This is usually expressed as a return period in years, for example a 1 in 50 years means that a flood of this severity would on average be expected to occur once in a 50 year return period. Flooding is often exacerbated, or even caused, by poor river maintenance reducing the capacity and by blockages of the channel and structures with debris and litter.

Floodplains store and convey water during times of flooding. Floodplain storage reduces the peak flood flow in a river and the effect of this is to reduce flood levels and the risk of flooding downstream. Additionally floodplains assist in the conveyance of flood waters and this has an important bearing on flood levels and flood risks.

5 Uses, Activities and Pressures

If sufficient areas of floodplain are embanked, raised or built upon the result will be an increase in flood levels elsewhere. In accordance with the principles of sustainable development the Agency will therefore advise Local Planning Authorities to use their powers to guide development away from such areas in order to ensure that rivers and floodplains can fulfil their principal functions while contributing beneficially to the environment.

Flood defences are designed to protect an area against a flood of a particular return period. Different types of land use are protected against different sizes of flood and the target 'Standards of Service' are detailed in Section 6.3.3, map 21 and table 14.

Whilst the responsibility for the maintenance of any watercourse normally rests with the riparian owner, that is the owner of the river bank and bed, certain reaches of the river system are formally designated as "Main River". On Main Rivers the Agency has permissive powers to construct and maintain flood defences and to control the actions of others through Byelaws and the issuing of Land Drainage Consents. District and County Councils have permissive powers to carry out works on ordinary watercourses, those not designated as Main River, and to make Byelaws although this still requires the Agency's consent.

In respect of flood defence the Agency has a supervisory role over all matters relating to watercourses. It has direct powers of control over the construction or alteration of structures in, over, under or within eight metres of those watercourses designated as Main River, and over the construction or alteration of culverts, mill dams, weirs or other like obstructions in ordinary watercourses.

Wider control over the river system in relation to development is achieved through the Town and Country Planning Acts and the Agency's role as a statutory consultee.

Local Perspective

Flooding from a number of Main River watercourses has long been a problem within the plan area and flood alleviation schemes have been carried out to protect the urban areas of Draycott, Shardlow, Great Wilne, Ambaston, Derby, Little Eaton, Matlock, Darley Bridge and Duffield from flooding. Map 21 shows the watercourses designated as Main River in the plan area.

The Agency is to undertake a hydraulic modelling study of the Rivers Derwent and Wye in order to determine the current standard of the flood defences and define the floodplain limits. An asset survey, consisting of a detailed investigation to identify and record the nature and structural condition of the flood defences, has also been carried out.

While most of the Main River urban flooding has been reduced by flood alleviation schemes inevitably some property and land is not protected and the Agency is unable to provide defences where the cost of doing such works outweighs the benefits gained. To assist the public in such areas a flood warning service is operated by the Agency and, within the plan area, this covers the River Derwent between Bamford and Church Wilne and the River Wye between Buxton and Rowsley.

5.10 Conservation

General

The Agency, whilst carrying out its functions or dealing with proposals by others, has a duty to promote and further the conservation of flora and fauna. Areas of interest to the Agency are shown on Map 15.

This duty includes:

- the protection and, where appropriate, enhancement of habitat to improve faunal and floral diversity which may be entirely or partially dependent on the water environment
- the protection of areas formally designated as being of particularly high conservation value, including Special Areas for Conservation (SAC), Special Protection Areas (SPA), Sites of

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**Derbyshire Derwent
Local Environment
Agency Plan**

Map 15



**ENVIRONMENT
AGENCY**

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**Nature conservation
and heritage**

KEY

- LEAP area
- Watercourse
- Canal
- Built up area
- Peak District National Park
- SSSIs
- SINC
- SAMs

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5 Uses, Activities and Pressures

Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Environmentally Sensitive Areas (ESA).

- the protection of sites which, although valuable in ecological terms, are not formally protected, for example other nature reserves and Sites of Importance for Nature Conservation.

Local perspective

The moorlands of the Dark Peak are sparsely populated and are covered by vast tracts of blanket bog. Natural erosion of the peat, formed over 10,000 years, has been induced by atmospheric pollution, burning and overgrazing. There is also some evidence that the bogs are drying out and there has been a resulting decline in plant and bird species on the moors. Habitats should be allowed to develop to link and extend the good wildlife sites remaining (see Issue 18).

The spraying of bracken in the upland areas causes concern for water quality issues in the headwaters of the catchment and the resulting bare soil is prone to erosion (see Issue 14).

The dales of the White Peak hold the largest concentration of wildlife but the interest of the dale sides could be extended into the poorer valley bottoms developing areas of wet alder woodland. Further down the catchment there have been significant ecological losses in the valley floodplains and more favourable management practices that encourage naturally flooding water meadows would see the return of many species. Areas of alder carr and rich bankside vegetation would provide habitat for otters (see Issue 18).

Mineral extraction is the most visible sign of environmental impact in the attractive landscape of the Peak District. Mining for limestone has created large open quarry sites and mining for gritstone has created many disused sites that are in an advanced state of ecological succession, providing habitats for many bird and plant species. Dewatering of limestone quarries can have an effect on watercourses that are fed from the limestone aquifer.

Old lead mining sites and the artificial soughs created for drainage can also affect flows in watercourses, for example the River Lathkill and a greater understanding of the relationship between aquifers and watercourse flow is needed (see Issue 2).

Sand and gravel extraction in the floodplain of the lower reaches of the Derwent has put at risk the unique and rich archaeological resource and dewatering activities can have an effect on adjacent wetland sites (see Issue 16). There is potential, however, for restoration of the gravel pits for wildlife conservation purposes.

The Derwent Valley has extensive growths of Himalayan Balsam and Japanese Knotweed along most of its length and it is unlikely that this will now be contained although spot spraying in some locations is encouraged. A large infestation of Giant Hogweed has been treated on the River Wye upstream of Bakewell. It is very important that this growth is contained to prevent widespread growth downstream, in areas used heavily by tourists. There is also evidence of an increase in the incidence of *Crassula helmsii* (Australian stonecrop) in stillwaters in the plan area (see Issue 13).

The decline of the otter, water vole and native crayfish along the rivers in the plan area is to be addressed by identifying areas for re-colonisation, undertaking surveys of any remaining populations and assessing management practices to ensure the right habitat is preserved, enhanced or created (see Issue 18).

5.11 Fisheries

General

The Agency has duties to maintain improve and develop fisheries in its area. Fish populations are affected by both the quality and quantity of water as well as suitable related physical habitat features. Fish are therefore important indicators of the overall health of the river.

**Derbyshire Derwent
Local Environment
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Map 16



**ENVIRONMENT
AGENCY**



EC designated Fisheries

KEY

- LEAP area
- Watercourse
- Reservoir/Lake
- Canal
- Built up area
- Salmonid
- Cyprinid

5 Uses, Activities and Pressures

The Agency is committed to the maintenance of breeding populations of salmonid fish.

The Agency has formal responsibility towards angling and sells rod and net licences which are a legal requirement for fishing for trout or freshwater fish.

Local perspective

There are 195.3km of river designated as Salmonid or coarse fisheries within the plan area, under the EC fisheries directive and details are shown on Map 16.

The major concern for the trout fisheries in the upstream area of the river is water quality which maintains excellent trout fisheries on the River Derwent from Matlock upstream. The trout fisheries of the limestone area to the west are higher biomass fisheries due to the richness of the streams and are found in the Wye and its tributaries particularly the Lathkill and the Bradford.

The reservoirs of the upper Derwent in the Ladybower system are top quality fisheries maintained by put and take stocking policy. Ogston is a major trout reservoir further downstream

From Matlock downstream coarse fish predominate and below Derby there is a major and valuable coarse fishery down to the Trent. This is used for fishing matches and recreational/leisure fishing. It contains a very high stock of chub, barbel, roach, tench and carp.

5.12 Recreation and Navigation

General

The Agency has a duty under the Environment Act 1995 to promote the use of water and land associated with water for recreational purposes. Consequently the Agency encourages the use of its own land for this purpose, where this does not conflict with conservation issues. The needs of disabled persons are taken into account.

The Agency has few landholdings in the plan area and therefore promotes recreation through collaborative schemes with other organisations (see Map 17).

Local Perspective

The plan area is used extensively by tourists visiting the dales within the Peak National Park, the river valleys, the reservoirs, the public rights of way and disused railway tracks, the historical buildings and caves. This use causes serious problems with choked roads and overcrowded car parks in 'honeypot' areas. Many of the recreational activities enjoyed include the following;

Walking is the prime use with the moorland, river valleys and established walks, such as the Pennine Way, being used daily. This extensive use is causing erosion of paths and is disturbing breeding birds in certain sensitive areas.

Rock climbing is carried out on rock faces along the upland valleys and is a very popular activity. Climbing can put pressure on breeding birds, such as ravens, using the ledges and the use of permanent pins in the popular climbs is seen by some as an intrusion into the natural environment.

Fishing takes place along the rivers, trout fishing in the upland rivers such as the Upper Derwent, Rivers Wye and Lathkill and Noe, and coarse fishing in the Lower Derwent. The reservoirs in the uplands provide excellent trout fishing in extremely pleasant surroundings. Angling can add to the disturbance factor for breeding birds.

The Lower Derwent is a navigation waterway, but is not used for this purpose. There are however canoe access points at other locations on the river, and boat trips are also run at specified sites. The impounded stretches between weirs gives sufficient depth of water for water craft but problems can be experienced between recreational users on the water and those on the bank.

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**Derbyshire Derwent
Local Environment
Agency Plan**

Map 17

ENVIRONMENT
AGENCY

5 Uses, Activities and Pressures

Caving is another popular recreational activity, with an extensive network of caves in the limestone area. Cavers are experiencing problems with sewage seeping into the caves from discharges on the ground surface and from spreading of materials onto land.

Power Boating is provided for at Church Wilne Lagoon, an excellent venue close to the reservoir. It is likely that another venue will become available close to the Derwent/Trent floodplain as part of gravel extraction.

Cycling enjoys popularity in the Derby area with an excellent cycle track following the River Derwent from the south to the north of the city. The use of old railway tracks for cycles is provided for at High Peak Trail, amongst others, with hire cycles being available.

5.13 Heritage

General

The Agency has a duty to conserve and enhance landscape, archaeological, architectural and historic features which are affected by the operations it undertakes or which it consents and licences.

This duty deals with the protection of:

- sites that are formally designated as being of value, for example National Parks, Areas of Outstanding Natural Beauty (AONBs), Scheduled Ancient Monuments (SAMs), Listed Buildings and Conservation Areas.
- sites which although valuable in landscape, archaeological or historical terms are not formally protected, for example sites on the Sites and Monuments Records.

Local Perspective

The plan area played a very important part in the development of the textile industry in the UK, the waters being harnessed for power for the mills. There are many weirs and structures on the river systems, a legacy of this historic use of water during the Industrial Revolution. Many of these structures are becoming derelict and weirs, such as Calver Weir, are at risk of collapse. This would be a loss to the historical fabric of the region and lowering of upstream water levels could have a deleterious effect on floodplain wetlands. The use of weirs, weir streams and structures to provide electricity is increasing in the Rivers Derwent and Wye and careful monitoring of the water used for hydropower purposes is essential to protect the wildlife resource from unnecessary damage from changing water levels.

The Derwent Valley Trust project will encourage a wider interpretation of the industrial uses of the valley and associated watercourses.

The Derby Sandiacre Canal Company are actively pursuing the restoration of the canal from Derby to the Trent and Mersey Canal. There are many obstacles to be overcome including development on the old canal line and establishing a viable water supply for the canal.

The moorlands of the Peak District are very rich in archaeological resource and studies are being carried out by Peak District National Park Authority to better assess this unique resource.

Section 6 - State of the Environment

This section assesses the current state of the plan area in terms of land, air, water and wildlife and heritage. This state is then compared with targets, which are the standards considered necessary in order to enable the well-being of natural resources, ecosystems and public health to be maintained and where appropriate enhanced. These targets can be local, national or international, statutory or policy based and may be numerical, descriptive or perceptive.

The environmental indicators used to assess the state of the environment are those currently available through current monitoring and historic information. They may not be the best or the most accurate, but they are a starting point.

This process identifies shortfalls in targets, compared to the current state, which is how some of the issues (Section 3) were identified.

- 6.1 Land**
 - 6.1.1 Waste management
 - 6.1.2 Integrated Pollution Control
 - 6.1.3 Radioactive substances
- 6.2 Air**
 - 6.2.1 Air quality
- 6.3 Water**
 - 6.3.1 Water quality
 - 6.3.2 Water resources
 - 6.3.3 Flood defence
- 6.4 Conservation**
 - 6.4.1 Wildlife and heritage
 - 6.4.2 Recreation
 - 6.4.3 Fisheries

6 State of the Environment

6.1 Land

6.1.1 Waste management

Objectives and targets for waste management

The targets for sustainable waste management have been set by the Government through the DoE White Paper on waste - "Making Waste Work - A Strategy for Sustainable Waste Management in England and Wales". The major overall objectives are:-

- to reduce the amount of waste that society produces;
- to make best use of the waste that is produced; and
- to choose waste management practises which minimise the risks of harm to human health and of immediate and future damage to or pollution of the environment.

In order to achieve these objectives, the following targets have been set;

- To stabilise the production of household waste at its 1995 level.
- To reduce the proportion of controlled waste going to landfill by 10% over the next 10 years and to make a further similar reduction in the following 10 years.
- To recycle 25% of household waste by the year 2000.
- 75% of companies with more than 200 employees to have published environmental policies covering waste issues by the end of 1999.
- 50% of companies with more than 200 employees to have management systems in place to give effect to their environmental policies by the end of 1999.

The Agency will need to develop strong contacts with local waste disposal and collection authorities to ensure the success of recycling and the sustainable management of household waste.

Current State of waste management

In Derbyshire, the County Council produced a Waste Disposal (Management) Plan in 1985 to account for the period between 1985 and 1995. The Plan considered all the technical issues regarding waste management and concludes by making reference to the future requirement for landfill space in the area. A new Plan to account for the 10 year period from 1995 is currently being prepared. The Plan was a statutory requirement of Section 50 of the Environment Protection Act 1990 but this requirement has been repealed by the Environment Act 1995.

The Derbyshire Structure Plan - Consultation Draft 1996, also considers developments which have taken place in the national and regional policy context for waste disposal and management, replacing the previous Approved Structure Plan, dated 1990. It is the source of the following facts and statistics on the waste arising within the area. However, it should be noted that activities governing waste collection have been administered on a local political boundary basis and as such it cannot at present be dissected in a way which reflects the Derbyshire Derwent plan area.

These figures do not include non-controlled wastes such as explosives and radioactive wastes, nor does it include a large volume of waste from mines, quarries and agriculture, the bulk of which is disposed of at source.

The Derbyshire County Council Waste Regulation Authority Annual Report 1994/95 details how the Authority undertakes its statutory duties as required by Section 67 of the Environment Protection Act 1990 and is the source of the following facts and statistics on the waste disposal within the area. Again, it should be noted that

6 State of the Environment

these activities have been administered on a local political boundary basis and as such it cannot presently be dissected in a way which reflects the Derwent Plan area.

Table 5 - Estimated controlled waste arising within the area (1993)

Waste type	Amount (tonnes)
Household/Commercial	514,000
Non-hazardous industrial	1,315,000
Construction/Demolition	387,000
Special	103,000
TOTAL	2,319,000

The vast majority of special wastes disposed of within Derbyshire are consigned to sites outside of the plan area and the details are not thought to be relevant for inclusion in this document.

As the main component of household waste is biodegradable matter, there is considerable scope for composting. Whilst there is no strategic County input, several District Councils have been responsible for setting up home composting schemes, though as yet there is no common approach.

Table 6 - Estimated controlled wastes disposed of within the area 1994/95

Waste type	Amount (tonnes)
Household/commercial (including civic amenity wastes)	508,125
Non-hazardous industrial	887,987
Construction/Demolition	280,791
Pulverised Fuel Ash	24,207
Special	93,570
Landspreading	154,975
Imported	7,036
TOTAL	1,956,691

6.1.2 Integrated Pollution Control (IPC)

Objectives and targets for Integrated Pollution Control

The concepts of BATNEEC and BPEO are applied to IPC, which is a dynamic process.

The most sustainable form of development is that which achieves the optimum distribution of any pollutants remaining to be released to the environment after they have been minimised under BATNEEC to the three media of land, air and water, according to the ability of those media to accept such pollutants, without, for example, exceeding critical loads.

These objectives are already applied to IPC and the Agency will continue to apply them and will seek to review their application when significant developments occur.

6 State of the Environment

Current state of Integrated Pollution Control

Within the plan area, there are 26 authorised processes. These are listed in Table 3 in section 5.2.1. Each authorisation provides a brief description of the process, identifies the prescribed substances released from it and, in most cases, contains limits which restrict the quantity of these substances which can be released. The authorisations also specify the monitoring regime which the operator is expected to undertake and the way in which the results obtained are to be reported to the Agency. The Agency, through a network of independent contractors, undertakes check monitoring of each process. All monitoring results provided by the operator or the Agency's contractors are placed on the public register. Almost all the authorisations have an associated improvement programme which the process operator is required to implement and report on. These reports are also placed on the public register.

The Agency reviews the release data obtained (and the results of any dispersion modelling or environmental monitoring where this is available) in order to assess the impact of the process on the environment. With regard to air quality, it should be noted that the Agency is not the prime regulator, this falls to the Local Authorities, who have wider powers in this respect. With regard to process releases into surface or ground waters and releases into land, the Agency is the prime regulator.

6.1.3 Radioactive substances

Objectives and targets for radioactive substances

The Government's objectives on radioactive waste are set out in the White Paper "*Review of Radioactive Waste Management Policy: Final Conclusions*". This states that radioactive waste management should be based upon the principles of sustainable development.

The objectives are that;

- radioactive wastes are not unnecessarily created;
- such wastes as are created are safely and appropriately managed and treated; and
- they are then safely disposed of at appropriate times and in appropriate ways.

This means managing and disposing of the waste in ways that protect the public, the workforce and the environment. The Agency will continue to contribute to these objectives.

Current state of radioactive substances

Within the plan area the Agency regulates 2 nuclear installations and 3 separate disposal authorisations, all of these premises are in Derby. Some low level waste from Rolls Royce is disposed of to land at Crich near Matlock. There are some 60 closed source registrations regulated by the Agency. There are no facilities authorised to incinerate low level radioactive wastes, this material is transported by road to sites outside the plan area for authorised disposal.

6.2 Air

6.2.1. Air Quality

Objectives and targets for air quality

The Agency's objectives for improving air quality are to;

- help the Government deliver its Air Quality Strategy;
- to ensure emissions from the major industrial processes to the atmosphere are reduced;

6 State of the Environment

- to ensure specific emissions of sulphur dioxide and oxides of nitrogen, which contribute to acid rain, are reduced;
- to discourage the use of solvents in industry, which contribute to the production of ozone, the major photochemical pollutant; and
- to set an example in reducing emissions from vehicles by reducing our own mileage and increasing the use of public transport.

To comply with the United Kingdom National Air Quality Strategy (UKNAQS) (published March 1997) each Local Authority will have to assess the air quality within its boundary and examine how this compares with standards and objectives laid out in the Strategy. Each Local Authority is also required to provide information to the public on air quality within its boundary.

The existing European Union Air Quality Standard for nitrogen dioxide is $200\mu\text{g}/\text{m}^3$ (expressed as the 98th percentile) and for sulphur dioxide it is $120\mu\text{g}/\text{m}^3$ (expressed as the median daily value).

Current State of air quality

Derby is the only major conurbation within the plan area and air quality in the city is monitored by Derby City Council. Summaries of the monitoring results for recent years provided by Derby City Council indicate that there have been no exceedences of the EC limit values for smoke and sulphur dioxide since 1983 and that nitrogen dioxide and ozone levels have been such that the air quality has been categorised (according to the DETR banding system) as "Very Good" almost always and "Good" for the remainder of the time.

Table 7 below lists the air quality objectives given in the UKNAQS. The Agency is required to take into account this Strategy and these objectives when authorising existing and new Part A processes.

Table 7 - United Kingdom National Air Quality Strategy Objectives

Pollutant	Standard		Objective - to be
	Concentration	Measured as	
Benzene	5ppb	running annual mean	5ppb
1,3-Butadiene	1ppb	running annual mean	1ppb
Carbon Monoxide	10 ppm	running 8-hour mean	10ppm
Lead	$0.5\mu\text{g}/\text{m}^3$	annual mean	$0.5\mu\text{g}/\text{m}^3$
Nitrogen dioxide	150ppb	1 hour mean	150ppb, hourly mean*
	21ppb	annual mean	21ppb, annual mean*
Ozone	50ppb	running 8-hour mean	50 ppb, measured as 97th percentile*
Fine particles (PM_{10})	$50\mu\text{g}/\text{m}^3$	running 24-hour mean	$50\mu\text{g}/\text{m}^3$, measured as 99th percentile*
Sulphur dioxide	100ppb	15 minute mean	100ppb, measured as 99.9th percentile*

ppm = parts per million; ppb = parts per billion; $\mu\text{g}/\text{m}^3$ = micrograms per cubic metre

* = these objectives to be regarded as provisional

6 State of the Environment

6.3 Water

6.3.1. Water quality

Objectives and targets for surface water quality

The Agency's principal objective for surface water quality is:-

- To achieve a continuing overall improvement in the quality of rivers, estuaries and coastal waters through the prevention and control of pollution. In achieving this we aim to ensure that the polluter pays.

Current state of biological surface water quality

The headwaters of the River Derwent and its upland tributaries are typical oligotrophic upland streams with invertebrate communities adapted to lower pH levels. The headwaters of one tributary, Peakshole Water, emanate from Peak Cavern in Castleton, where biological monitoring has indicated periodic toxic pollution subsequently traced to contamination by sheep-dip. Biological water quality is shown on Map 18.

At Rowsley the River Derwent is joined by the River Wye, which rises above Buxton and is immediately affected by urbanisation and storm runoff. Buxton STP causes an additional deterioration in biological quality but downstream recovery to very good quality is aided by dilution from clean tributaries including the River Lathkill. The biological quality of Bentley Brook, entering the River Derwent at Matlock, is suppressed by effluent from the dyeing industry, although the situation has been improved by new treatment processes and the brook has no biological impact on the River Derwent.

In the mid 1980's a serious decline in the biological quality of the River Derwent below Matlock STP and the Lea Brook led to an intensive investigation to discover the cause. The use of the insecticide permethrin by a dyeworks was stopped and this together with the repair of broken drains led to a dramatic improvement in biological quality between Matlock and Derby which has been maintained to the present day.

Downstream of Whatstandwell the invertebrate fauna changes in character as the River Derwent becomes deeper and sluggish. The River Amber, which joins in this stretch supports good biological quality in its upper reaches but is then joined by the lower quality Alfretton Brook. This tributary drains a highly urbanised catchment on a former coalfield, although some improvement has followed extensive rebuilding of STPs. Other tributaries, including the River Ecclesbourne and Bottle Brook, have also shown suppressed biological quality due to various water quality problems associated with industry, agriculture and sewage effluent, although these are being addressed and quality is improving.

The quality of the River Derwent above Derby is now good or very good, although some decline takes place through the city reflecting urban runoff and stormwater inputs. Derby STP effluent is treated to a high standard, but adds large amounts of nutrients which contribute to eutrophication below in the lower reaches (see issue 4).

The River Derwent catchment and particularly the Rivers Wye and Lathkill were strongholds of the native crayfish (*Austropotamobius pallipes*) but the population crashed in 1991, most probably due to crayfish plague. Isolated pockets of crayfish remain in some small tributaries, but it may be many years before there is a full recovery (see issue 18).

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**Derbyshire Derwent
Local Environment
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Map 18

**ENVIRONMENT
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CASTLETON

**UPPER
DERWENT**

TIDESWELL

BUXTON

BAKEWELL

MATLOCK

MATLOCK BATH

**MIDDLE
DERWENT**

WIRKSWORTH

BELPER

DUFFIELD

CLAY CROSS

SOUTH NORMANTON

ALFRETON

SWANWICK

RIPLEY

DERBY

**LOWER
DERWENT****Biological Water Quality****KEY**

- LEAP area
- Watercourse
- Canal
- Built up area
- Water quality sub-catchment
- Very good
- Good
- Fairly good
- Fair
- Poor
- Bad

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6 State of the Environment

Current state of chemical surface water quality

Map 19 shows chemical water quality compliance with the river ecosystem targets for rivers and canals. Three categories are shown, based on statistical analysis of how compliant current quality is with long term objectives. The categories are (*compliant, marginal failure and significant failure*). This categorisation allows problems to be identified and quantified. For more explanation of these categories, see Appendix 1.

Table 8 identifies the river stretches covered by the plan and assigns the appropriate River Ecosystem (RE) classes to them.

The column headed "Current Quality" describes the actual quality of the river over the last three years (1992 - 1994) in terms of an RE class.

The next column, "Short Term Objectives", shows the RE class assuming that all the consented discharges within each stretch of river discharge up to their consent limit in terms of quality and quantity. The objective should be met within the plan period ie. the next five years and will take account of any improvements planned by Severn-Trent Water Limited under the water industry's agreed capital investment programme (AMP 2).

The final column entitled "Long Term Objective", is the objective beyond the plan period and is a translation of the river quality objective from the former NWC classification scheme. River and canal stretches that are not meeting the Agency's River Quality Objectives are highlighted in bold. Short term objectives are for 1997.

For a number of stretches current quality is better than that required by either/or both, the short and long term objectives. It is considered that these apparent improvements are not sustainable because of atypical results or where planned work has not been completed. If current quality is sustained in the future the decision on whether to upgrade these stretches will be reviewed.

The RE objectives are described in more detail in Appendix 1.



Photograph 7 - Rising leachate levels on old landfill sites pose a risk to water quality (see Issue 10)

**Derbyshire Derwent
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Map 19



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Table 8 - River Quality Objectives

Watercourse	Stretch	Current Quality	Short term objective	Long Term Quality Objective
Derwent	FB above Howden Res. to Yorkshire Br	RE1	RE1	RE1
Derwent	Yorkshire Bridge to Hathersage Br	RE1	RE1	RE1
Derwent	Hathersage Br to Grindleford Br	RE1	RE1	RE1
Derwent	Grindleford Br to conf. with R Wye	RE1	RE1	RE1
Derwent	Conf. with R Wye to Matlock STP outfall	RE1	RE1	RE1
Derwent	Matlock STP outfall to conf. with R Amber	RE2	RE2	RE2
Derwent	Conf. with R Amber to Belper STP	RE2	RE2	RE2
Derwent	Belper STP outfall to A6 Rd Br, Milford	RE2	RE2	RE2
Derwent	A6, Milford to A38, Allestree	RE2	RE2	RE2
Derwent	A38, Allestree to St Mary's Br, Derby	RE2	RE2	RE2
Derwent	St. Mary's Br, Derby to Derby STP	RE2	RE2	RE2
Derwent	Derby STP to 'D' Cut Weir	RE4	RE4	RE4
Derwent	'D' Cut Weir to B5010 Rd Bridge	RE4	RE4 (2000)	RE3
Derwent	B5010 Rd Bridge to Ockbrook confluence	RE4	RE4 (2000)	RE3
Derwent	Ockbrook Conf. to conf. with R Trent	RE3	RE3	RE3
River Ashop	Snake Rd Br to conf. R Alport	RE1	RE1	RE1
River Ashop	Conf. R Alport to conf. R Derwent	RE1	RE1	RE1
River Alport	Conf. trib to conf. R Alport	RE1	RE1	RE1
R Noe	Track br at Edale to Peakshole Water	RE1	RE	RE1
R Noe	Peakshole Water to conf. R Derwent	RE1	RE1	RE1
Peakshole Water	Castleton rd br to conf. with R Noe	RE1	RE1	RE1
Stoke Brook	Stoney Middleton to conf. R Derwent	RE3	RE3	RE3
Bar Brook	Conf. Blake Bk to conf. R Derwent	RE1	RE1	RE1
R Wye	Br at Ashwood Pk Buxton to Buxton STP	RE2	RE2	RE2
R Wye	Buxton STP outfall to Ashwood Quarry	RE3	RE3	RE3
R Wye	Ashwood Quarry to Kingsterndale	RE3	RE3	RE3
R Wye	Rd Br, Kingsterndale to FB at Kingsdale	RE2	RE2	RE2
R Wye	FB, Kingsdale to A6 Rd Br, Shacklow WDS	RE2	RE2	RE2
R Wye	A6 Rd Br, Shacklow WDS to Rowsley	RE1	RE1	RE1

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R Wye	Rowsley to conf. with R Derwent	RE1	RE1	RE1
R Lathkill	FB at Cales Dale to minor Rd Br, Alport	RE1	RE1	RE1
R Lathkill	Minor Rd Br, Alport to conf. with R Wye	RE1	RE1	RE1
R Bradford	Ford, Gratton FM to conf. R Lathkill	RE1	RE1	RE1
Bentley Bk	Matlock Moor to conf. trib. Drabble	RE1	RE1	RE1
Bentley Bk	Conf. Trib. Drabble to A615, Matlock	RE4	RE4	RE4
Bentley Bk	A615, Matlock to conf. with R Derwent	RE3	RE3	RE3
Amber	Conf. Smalley Bk to Ogston Res. outfall	RE1	RE1	RE1
Amber	Ogston Res. outfall to conf. Press Bk	RE1	RE1	RE1
Amber	Press Bk to conf. Alfreton Bk	RE2	RE2	RE2
Amber	Conf. Alfreton Bk to Weir Mill Br	RE3	RE3 (1999)	RE2
Amber	Weir Mill Br to conf. Hartshay Bk	RE3	RE3 (1999)	RE2
Amber	Hartshay Bk to A610(T) Rd Br, Ridgeway	RE3	RE3 (1999)	RE2
Amber	A610(T) Rd Br, Ridgeway to R Derwent	RE3	RE3 (1999)	RE2
Press Brook	Press Lane Br, Alton to Claycross STP	RE2	RE2 (1999)	RE2
Press Brook	Claycross STP to B6014 Rd Br, Stretton	RE3	RE3 (1999)	RE2
Press Brook	B6014 Rd Br, Stretton to R Amber	RE2	RE2 (1999)	RE2
Alfreton Bk	Rail Br, Huthwaite to Ford Br Lane	RE3	RE3 (1999)	RE3
Alfreton Bk	Ford Br Lane to Park Mill Dr	RE4	RE4 (1999)	RE3
Alfreton Bk	Park Mill Dr. to Alfreton STP outfall	RE4	RE4 (1999)	RE3
Alfreton Bk	Alfreton STP outfall to A61 Rd Bridge	RE4	RE4 (1999)	RE3
Alfreton Bk	A61 Rd Bridge to conf. R Amber	RE4	RE4 (1999)	RE3
Westwood Bk	Br nr Nethermoor to Railway Culvert	RE2	RE2	RE2
Westwood Bk	Railway Culvert to Blackwell Bk	RE3	RE3	RE3
Westwood Bk	Blackwell Bk to conf. with Alfreton Bk	RE3	RE3	RE3
Blackwell Bk	B6026 Rd Br, Newton to Westwood Bk	RE5	RE5	RE5
Hartshay Bk	Butterley Res to A610 Rd Culvert	RE4	RE4	RE4

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Hartshay Bk	A610 Rd Culvert to minor Rd Lower Hartshay	RE5	RE5	RE4
Hartshay Bk	Lower Hartshay to conf. with R Amber	RE5	RE5	RE4
Heage Bk	Rd Br, Nether Heage to R Amber	RE3	RE3	RE3
Ecclesbourne	B5023, Millers Green to Wirksworth STP	RE2	RE2	RE2
Ecclesbourne	Wirksworth STP to Bateman Br	RE2	RE2	RE2
Ecclesbourne	Bateman Br to Weir at Puss in Boots	RE2	RE2	RE2
Ecclesbourne	Weir at Puss in Boots to R Derwent	RE1	RE1	RE1
Bottle Brook	FB at Greenhill Locks to Marehay STP outfall	RE2	RE2	RE2
Bottle Brook	Marehay STP outfall to US Denby Potter	RE5	RE5	RE5
Bottle Brook	US Denby Pottery to Kilburn Toll Barr	RE4	RE4	RE4
Bottle Brook	Kilburn Toll Barr to Kilburn STP outfall	RE3	RE3	RE3
Bottle Brook	Kilburn STP to conf. Park Bk	RE3	RE3	RE3
Bottle Brook	Conf. Park Bk to conf. R Derwent	RE2	RE2	RE2
Markeaton Bk	Mercaston Green to Cutler Bk, Kedleston	RE2	RE2	RE2
Markeaton Bk	Cutler Bk, Kedleston to Ford St. Derby	RE2	RE2	RE2
Markeaton Bk	Ford St, Derby to conf. with R Derwent	RE3	RE3	RE3
Mackworth Bk	A52, Kirk Langley to Ford at Home Fm	RE2	RE2	RE2
Mackworth Bk	Ford at Home Farm to conf. Markeaton B	RE2	RE2	RE2

NB: stretches shown in bold are either marginally or significantly non-compliant with long term objectives (see Map 19).

River Derwent

The current quality of the River Derwent at both Borrowash and Spondon, Iron Bridge is RE4(fair). The target river quality is RE3 (fairly good). The reason for failure at these locations is caused by exceedence of the limit set for unionised ammonia. The standard is 0.025 milligrammes per litre.

The primary cause for the failure at Borrowash is associated with discharges from the foul sewerage system in the City of Derby. The water company have started infrastructure improvements with the aim of resolving this specific problem along with a number of flooding problems in the city.

The reason for the failure at Spondon, Iron Bridge is more complex, due to the combined effects of the discharges from Derby STP, cooling water from Courtaulds Chemicals, air and river temperatures and river flows. Unionised ammonia levels are affected by temperature and pH.

The failure at Spondon is less significant than that at Borrowash and in view of the complex nature of the catchment at this location, further investigations and observations are planned prior to making any proposals for improvement.

Hartshay Brook

The quality of the Hartshay Brook is dominated by the effect of Swanwick and Ripley Northern STP, Sewage works refurbishment carried out during earlier phases of the water company's asset renewal programme have had significant beneficial impact on both the treated effluent quality and water quality. It is clear however that further improvements at these works will be required if the appropriate River Water Quality is to be achieved.

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Press Brook

The Press Brook at Stretton is affected by discharges from both the sewage works and sewerage system serving parts of Clay Cross. The precise cause of the intermittent deterioration in quality needs further investigation before improvements are proposed.

River Amber/ Alfreton Brook

The Alfreton Brook and the River Amber downstream of Shirland (Amber Mill) receives drainage from a predominantly urbanised catchment and therefore contains high proportions of treated sewage, urban runoff and industrial effluents.

The Alfreton Brook and the River Amber downstream of the confluence, from South Wingfield to Buckland Hollow, the water quality is affected by occasional elevated levels of ammoniacal nitrogen. There are a number of potential sources along this reach and further investigations are necessary to establish the causes.

Groundwater Quality

In the Sherwood Sandstone aquifer, groundwater quality is generally good being the typical calcium bicarbonate type. There is little influence from natural or artificial pollution. The groundwater becomes more mineralised beneath the confining Mercia Mudstone to the south. The sandstones are highly transmissive with respect to contaminants and are consequently highly vulnerable to pollution incidents.

The Carboniferous Limestone yields groundwater of the calcium bicarbonate type and is therefore of general good quality. The groundwater is generally harder and more alkaline than that of the Sherwood Sandstone. Nitrate concentrations are low, although fluoride levels and some heavy metals (particularly lead) can be locally elevated reflecting the influence of metalliferous deposits in mineralised areas of the aquifer. Transmission of contaminants via fissure systems in the limestone strata can be extremely rapid and the aquifer is, vulnerable to pollution incidents, as above.

The groundwater derived from Coal Measures is typically very hard, with elevated chloride, sulphate and mineralisation levels and may be contaminated in urban/industrial areas. Groundwater derived from the Millstone Grit tends to be fairly soft and relatively acidic.

The Mercia Mudstone groundwater exhibits elevated sulphate levels due to the dissolution of the naturally existing gypsum within the mudstone sequences.

Sand and gravel drift deposits yield groundwater of similar composition to nearby major river systems. Away from rivers, the influence of more mineralised water will be greater.

EC Directive Reporting

These are directives that the Agency has responsibility for reporting.

Four EC Directives apply to the quality of surface water for potable (drinking water) abstraction, to support fish life and to control the discharge of dangerous substances. The four directives are;

- Dangerous Substances Directive (76/464/EEC);
- Freshwater Fisheries Directive (78/659/EEC);
- Urban Waste Water Treatment Directive (91/271/EEC); and
- Surface Water Abstraction Directive (75/440/EEC).

The Agency also has responsibilities for reporting under the Urban Waste Water Treatment Directive (91/271/EEC). Monitoring is currently underway with reporting at the end of 1997/ early 1998.

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Dangerous Substances

Dangerous substances relate to a wide range of materials that are harmful to the aquatic environment, including heavy metals, pesticides and organic solvents. The Directive sets a framework for the elimination or reduction of pollution of inland, coastal and territorial waters. The annex has two lists, List I and List II. List I, sometimes called the black list, are substances selected on the basis of their toxicity, persistence and bioaccumulation. List II (the grey list) have a deleterious effect and include zinc, copper and lead compounds, cyanide and ammonia.

Consents granted for the discharge of dangerous substances is set to ensure that the river downstream complies with Environmental Quality Standards (EQS). Monitoring points are located on rivers and canals downstream of known discharge points. Toxic metal standards are related to the hardness of water and the sensitivity of the aquatic life being protected.

Pollution Incidents

The Agency deals with a wide range of pollution incidents. Pollution of the environment is a criminal offence and the Agency will prosecute whenever necessary.

Water Pollutions

During 1996, 351 incidents were reported and investigated in the plan area. Of these, none were classed as a major (Category 1) incident, but 10 were classed as being significant (Category 2) incidents. The tables below summarise the pollution incident data for 1996 by source and type.

Table 9 - River Derwent - Pollution Incidents 1996

Source	Category 1	Category 2	Category 3	Total
Industrial & Commercial	0	1	70	71
Water Utility Companies	0	0	24	24
Agriculture	0	6	52	58
Other	0	3	93	96
Unsubstantiated	-	-	-	102
Pollution Incident Total				351

Type	Category 1	Category 2	Category 3	Total
Chemical	0	0	31	31
Oil	0	0	62	62
Sewage	0	2	29	31
Agricultural	0	4	44	48
Other	0	4	73	77
Unsubstantiated	-	-	-	102

Category 1

A major incident involving one or more of the following:-

- o Potential or actual persistent effect on water quality or aquatic life greater than 1 week.

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- Closure of potable water, industrial or agricultural abstraction necessary.
- Extensive fish kill (more than 100 fish).
- Excessive breaches of consent conditions and environmental impact.
- Extensive remedial measures necessary.
- Major effect on amenity value.
- Effect on conservation value.

Category 2

A significant pollution which involves one or more of the following:-

- Notification to abstractors necessary.
- Significant fish kill (10 - 100 fish).
- Readily observable effect on invertebrate life.
- Water judged unfit for stock.
- Bed of watercourse contaminated.
- Amenity value to the public, owners or users reduced.

Category 3

A minor pollution which involves one or more of the following:-

- Notification of abstractors not necessary.
- Fish kill (<10).
- No observable effect on invertebrate life.
- Suitable for stock watering.
- Stream bed locally contaminated (at discharge point).
- Minimum environmental impact.

6.3.2 Water resources

Objectives and targets for water resources

The Agency's overall objective for water management is to;

- promote sustainable development by seeking to protect and enhance the water environment;

This will be achieved by the following;

- a strategic approach to catchment protection;
- the need to work with natural river and coastal processes;
- integration of technical, economic and environmental factors;
- assessment of costs and benefits; and
- consultation with interests affected by the Agency's water management activities.

The Government's overall objective for water resource control is to;

- conserve, redistribute and enhance water resources.

The Agency is expected to use its powers to;

- encourage water conservation in areas of potential shortage where it is economic to do so;
- to encourage the development of new water resources in a sustainable way where they are needed.

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Current state of surface water resources

Surface water licensing policy for the plan area is largely determined by existing licences on the River Derwent for Public Water Supply and hydropower generation. The Agency has a duty not to issue a new licence which would cause derogation (i.e. taking water which others have a right to) or damage the environment.

All new surface water licences for consumptive use from the River Derwent and its main tributaries will include conditions which restrict or prohibit abstraction when flows fall below a prescribed flow at an appropriate control point, usually a flow gauging station. New licences on smaller watercourses will be subject to Local Prescribed Flows. These are imposed when it is not appropriate to link a licence to a prescribed flow at an appropriate gauging station. A weir or other measuring device is constructed in the watercourse to measure the prescribed flow at the point of abstraction.

Licensing Policies - River Derwent upstream of Spondon STP outfall (SK 389 349)

New licences involving a net loss may be issued subject to a prescribed flow restriction of 720MI/d measured at Derby S' Mary's flow gauging station. This is to prevent derogation of Severn Trent Water's abstraction at Ambergate and to ensure adequate dilution for effluent from Spondon STP. No further licences may be issued when the aggregate net quantity licensed in the catchment above Borrowash hydropower scheme since February 1995 exceeds 20MI/d.

Local Prescribed flow for minor tributaries.

River Derwent downstream of Spondon STP outfall

New licences involving a net loss may be issued subject to a prescribed flow restriction of 360MI/d measured at Church Wilne flow gauging station. This is to prevent derogation of Severn Trent Water's abstraction at Draycott. Also, no further licences may be issued upstream of the Borrowash hydropower scheme when the aggregate net quantity licensed in the catchment since February 1995 exceeds 20MI/d.

Local Prescribed flow for minor tributaries.

River Derwent downstream of Church Wilne Flow Gauging Station (SK 440 315)

Licences issued subject to a prescribed flow at Colwick flow gauging station equivalent to 3,200MI/d at Staythorpe.

River Wye

Licences issued subject to primary restriction flow at Ashford flow gauging station.

Local prescribed flow for minor tributaries.

River Amber

Licences issued subject to primary restriction flow at Wingfield Park flow gauging station.

Local prescribed flow for minor tributaries.

Current state of groundwater resources

The aquifers of the Midlands Region are divided into a number of areas or groundwater units, for the purpose of assessing resources and relating these to licensed abstractions. These groundwater units or aquifers are categorised on the basis of their available resources and the environmental needs of wetlands and watercourses to sustain water levels during periods of dry weather.

The classification is:-

- | | |
|---|--------------------------------------------------------------------|
| A | No resource available. |
| B | Special study required, with a presumption against large licences. |
| C | Special study required, but no presumption. |
| D | Resources available. |

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Generally in groundwater units where resources are available further licensing of new abstractions may be possible, but the objective is to ensure this is not beyond a sustainable limit for the environment. In addition to the above classifications the availability of groundwater resources is subject to other constraints such as local derogation, local aquifer properties and groundwater quality. When an application is made the Agency will not guarantee the groundwater quality nor the quantity abstracted from a source.

The current state of the main aquifer units within the catchment is summarised below. The boundaries of groundwater units are defined on geological and hydrogeological criteria and do not always correspond with surface water catchment boundaries. Map 20 shows groundwater management units in the plan area.

Major Aquifers - Sherwood Sandstones

Unit F2.1 (Derby North) - classification D

This aquifer is known to be of limited thickness and highly faulted. A few small industrial sources have been supported by this unit in the past. There is no objection in principle to new licence applications. Borehole yields are invariably poor.

Unit F2.2 (Muggington) - classification D

This aquifer is extensively fragmented and has limited thickness. There is no objection in principle to new applications but baseflow protection has to be considered.

Unit F2.3 (Kirk Langley) - classification D

This aquifer is extensively fragmented and has limited thickness. There is no objection in principle to new applications but baseflow protection has to be considered.



Photograph 8 - Low water levels in Ladybower Reservoir in October 1995



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Unit F3.1 (Shirley) - classification D

The resource balance indicates that this unit has substantial potential for development. However, borehole yields are extremely low as illustrated by a number of abandoned Severn Trent Water sites. There is no objection in principle to new licence applications, but baseflow protection has to be taken into account.

F10.6 (Wollaton) - classification D

This unit was formerly known as F1.9 (Sandiacre) but was enveloped into the new Wollaton unit in 1996. New and increased licences can be considered where low levels of abstraction have led to a slow but progressive rise in groundwater levels. Large proposals may, however, have to be time-limited to cater for any potential uptake of existing authorised abstraction.

Major Aquifers - Carboniferous Limestones

Unit D3.4 (Matlock) - classification C

Baseflow discharges from the limestone form a major part of the overall flow in rivers draining the area, particularly during periods of dry weather. These rivers support major Public Water Supply abstractions, and restrictions are applied to existing surface water licences. Protection of baseflow is therefore of paramount importance. There are no objections in principle to small, new groundwater abstractions (up to 20Ml/a). However, for larger proposals, an Environmental Report will be required in support of any licence application, and licences in excess of 100Ml/a will be time-limited in order to assess any long term impact on baseflows.

Borehole yields within the unit tend to be very poor and only when a good fissure system is intercepted can satisfactory yields be obtained.

Unit D3.5 (Buxton) - classification C

Baseflow discharges from the limestone form a major part of the overall flow in rivers draining the area, particularly during periods of dry weather. These rivers support major Public Water Supply abstractions, and restrictions are applied to existing surface water licences. Protection of baseflow is therefore of paramount importance. There are no objections in principle to small, new groundwater abstractions (up to 20Ml/a). However, for larger proposals, an Environmental Report will be required in support of any licence application, and licences in excess of 100Ml/a will be time-limited in order to assess any long term impact on baseflows.

Borehole yields within the unit tend to be very poor and only when a good fissure system is intercepted can satisfactory yields be obtained.

Minor Aquifers - Coal Measures

Unit D2.1 (Alfreton) - classification D

Minor Aquifers - Millstone Grits

Unit D2.2 (Belper) - classification D

Unit D2.3 (Hathersage) - classification D

Unit D2.4 (Barbrook) - classification D

Unit D3.2 (Hollinsclough) - classification D

6.3.3 Flood defences

Objectives and targets for flood defences

The Agency's principal objectives are to;

- provide effective protection for people and property against flooding from rivers; and
- provide adequate arrangements for flood forecasting and warning.

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To achieve these objectives, the Agency seeks to;

- maintain river defences and structures to appropriate standards;
- develop and implement the flood defences strategy through a systematic approach for assessing capital and maintenance requirements and develop medium and long-term plans for those defences owned and maintained by the Agency;
- encourage development of information technology and extension of facilities which will further improve the procedure for warning of, and responding to, emergencies;
- support Research and Development which will assist in identifying future flood defence needs;
- review best practices for all operational methods and the identification and justification of work, thus increasing efficiency and enhancing value for money;
- heighten general awareness of both Planning Authorities and developers of the need to control development in floodplains; and
- identify opportunities for the enhancement of environmental, recreational and amenity facilities when undertaking flood defence works.

Current state of flood defences

The current Standards of Service (SoS) for the Main Rivers within the Derwent plan area are indicated on Map 21. In general, the Standards of Service provided to these rivers have been assessed and found to be in line with the target SoS determined by the Agency as acceptable for the adjacent land use. The Agency aims to ensure that the existing defences are maintained to the required standard through an annual maintenance programme and asset surveys.

It has been identified that the existing flood defences and ground levels adjacent to the River Derwent south-east of Derby centre provide a less than adequate standard of flood protection than is desirable for large industrial sites and housing developments (see Issue 23). It is proposed therefore that new defences should be built along the river between Wilmorton Railway Bridge and Spondon in order to improve the flood protection to a 1 in 100 year standard.

It is not always possible to resolve flooding problems, as a solution to a problem may just shift it to a different location. A number of ordinary watercourses in the Derwent catchment have inadequate channel capacity and would require substantial improvement schemes in order to increase their flow carrying capacity. The costs of such schemes cannot usually be justified in terms of the benefits and the impact of such schemes on the local habitat of the watercourses are likely to be unacceptable from an environmental aspect. Other problems include undersized culverts and bridges, heavy siltation and obstructions in the watercourses which cause localised flooding. The probability of many of the flooding problems on ordinary watercourses occurring could be greatly reduced by regular maintenance, which is the responsibility of the riparian owner.

6.4 Conservation

6.4.1 Wildlife and heritage

Objectives and targets for wildlife and heritage

The Agency's strategic objectives are to;

- promote and further the conservation interests of the water environment, and to safeguard the conservation interests of designated and statutory sites;

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- maintain river corridors in as natural a state as possible to preserve ecological diversity;
- protect the landscape and features of archaeological, architectural and historical interest associated with rivers and wetlands;
- assess the environmental impact of all Agency activities and ensure that any adverse impacts are minimised and mitigated against; and
- safeguard the quality and quantity of water to achieve Biodiversity targets

The Agency's principal objective in relation to wildlife and heritage is to;

- conserve and enhance wildlife, landscape and cultural heritage.

To achieve this the Agency seeks to;

- assess and monitor conservation interest of inland and coastal waters and associated lands, river corridors and wetlands;
- ensure that the Agency's regulatory, operational and advisory activities take full account of the need to sustain and further conservation;
- incorporate the enhancement of target habitats and species outlined in the UK and in local Biodiversity Action Plans, when consistent with the purposes of enactment relating to Agency functions; and
- promote conservation to enhance the quality of the aquatic and related environment for the benefit of wildlife and people.

The Agency has developed targets for key wetland species and habitats in the Biodiversity Action Plan for the Midlands Region. Of the six species that the Agency is contact point for nationally, three occur in the plan area - water voles, otters and white clawed crayfish.

Targets for the Derbyshire Derwent area are therefore to;

- monitor habitats and species associated with inland waters, river corridors and wetlands;
- liaise with other bodies to support and promote initiatives to conserve, enhance and restore wetlands and river corridors;
- safeguard rare and protected species and seek additional information on the distribution and abundance of such species;
- seek opportunities to conserve and enhance the habitats required by water voles, otters and white clawed crayfish;
- seek opportunities, by working with other bodies, to link and extend the upper moorland and heathland habitats;
- encourage the use of agri-environment schemes to secure appropriate management of land within the river corridor;
- liaise with riparian owners and others to determine a strategy to control invasive alien plant species within the river corridor;
- work with planners and developers to ensure that future development does not have an adverse impact on watercourses and seek opportunities to extend conservation interest;

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- seek opportunities for Agency capital and revenue projects to protect or improve the physical character of the water environment;
- investigate restoration of the hydraulic connection between watercourses and the floodplain; and
- support initiatives to interpret the rich historical and archaeological interest of the river corridor.

Current state of wildlife and heritage

The area covered by the plan encompasses areas of particular wildlife and heritage value having natural and semi-natural river systems, varied geological strata, extensive moorlands, important woodlands and grasslands. This area has a rich and diverse habitat structure, with semi natural watercourses of high conservation value. Parts of rivers, however, have been highly modified as a legacy of the industrial revolution and the use of water for energy.

The plan area contains 3 Special Areas of Conservation, 1 Special Protection Area, 51 Sites of Special Scientific Interest, 415 Sites of Interest for Conservation and parts of the area are a National Park and an Environmentally Sensitive Area.

The status and distribution of the white clawed crayfish is not known entirely but the population in the Wye and Lathkill has been lost and there are only remnant populations in other parts of the plan area.

The otter, once widespread, is not present in the area but it is likely that this species will spread from the Staffordshire Moorlands to the upper parts of the plan area.

There is extensive growth of Japanese Knotweed and Himalayan Balsam along the River Derwent, and an infestation of Giant Hogweed on the River Wye. There is known to be phytophthora disease present among alder trees on the River Amber.

There has been significant ecological losses in the valley floodplains of the Dales and naturally flooding water meadows and areas of alder carr would provide habitat for the return of many species.

The lower part of the Derwent is rich in archaeological remains and there is a threat from gravel workings in the floodplains near the confluence with the River Trent. There are 196 Scheduled Ancient Monuments in the plan area. The weir at Calver is a listed structure and is in need of repair to prevent an eventual collapse. The moorlands are a very rich archaeological resource.

6.4.2 Recreation

The Agency's principal aim in relation to recreation is to:

- develop the recreational potential of inland and coastal waters and associated land.

The Agency's objectives are to;

- ensure that any works on river channels take account of recreational activities and, where appropriate, take opportunities to enhance facilities;
- promote the use of water and associated land for recreational purposes commensurate with the interests of other users and subject to the Agency's conservation duties;
- protect and promote public access to watercourses, including facilities for disabled persons, within a framework of existing Local Authority policies for visitor management, without unreasonable constraining other users; and
- safeguard the quality and quantity of water for recreational use.

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The provision of recreational facilities is not an Agency function, except on its own land, and the achievement of objectives will therefore depend on agreements and the goodwill of riparian owners and other interested parties.

The targets are therefore to:

- maintain, develop and improve recreation use of Agency owned sites;
- take account of recreation in proposals relating to Agency functions; and to
- promote the use of water and associated land for recreation purposes.

Targets for recreation are based on the demand for facilities as there are no recognised standards for the recreational use of rivers. Any targets set for recreation must take into account the conservation interest of the rivers.

Targets for Derbyshire Derwent Area are to;

- promote the use of river corridors for recreational purposes without compromising other users;
- promote public access to buildings, sites of archaeological, architectural, engineering and historic interest;
- safeguard existing recreational uses and, where practicable, incorporate recreational facilities into Agency schemes;
- take into account the needs of persons who are sick or disabled;
- maintain and enhance the diversity of natural river features and other riverine habitats;
- take account of recreational use when setting water quality objectives and minimum flows or levels when determining planning applications and applications for Agency consents; and to
- work with planners and developers to ensure that future development does not impact on the recreational value of rivers, and where possible to seek improvements.

Current State of recreation

In the upper part of the plan area the rivers and water supply reservoirs offer good trout fishing and coarse fishing is enjoyed along the whole of the River Derwent below Matlock.

The moors and dales offer excellent walks and the gorges and outcrops are used for climbing. The extensive limestone caves are much used for caving and pot holing.

A canoe slalom course at Matlock is used by the public and a club, but this is in need of restoration to upgrade the course for competition work.

A network of public rights of way, bridleways and old railway lines are used for walking, horseriding and cycling. The plan area generally is a well used resource, attracting high numbers of tourists.

The Cromford Canal is not used for navigation purposes but there are proposals to extend restoration of the canal. There are also long term proposals to restore the Derby Sandiacre Canal from the Trent & Mersey canal to the River Derwent. The lagoons at Church Wilne offer facilities for power boating and water ski-ing.

It is likely that recreational will continue to expand in the area and therefore promotion of recreational activities should be considered carefully in relation to other users and the conservation interest. A balance is required between the demands of users and those of conservation, as well as respecting the rights of riparian owners.

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6.4.3 Fisheries

The overall objectives for all fisheries is to;

The Agency's principal aim in relation to recreation is to:

- maintain and protect a healthy and sustainable fish population relevant to the historical perspective of the watercourses and to improve this where possible.

A fisheries strategy was published in 1993 and this attempts to maintain high to moderate quality native and stocked brown trout fisheries in the upper reaches and improve the habitat where possible. For the lower reaches the strategy is to maintain moderate mixed or coarse fisheries in conjunction and accordance with water quality objectives.

The targets for the Derbyshire Derwent area are therefore to;

- control illegal fishing by Bailiffing;
- monitor fish populations by a scientific programme;
- install fish passes where necessary; and
- maintain and improve habitats where possible.

Current state of fisheries

The River Noe is a well stocked brown trout fishery with good habitat but suffers in certain areas from water quantity problems.

The Wye is a high quality trout fishery from downstream of Buxton and has good habitat throughout.

The Lathkill and Bradford are high quality estate managed trout fisheries and are maintained to high standard.

The Amber is high quality native brown trout fishery in its upstream areas. It suffers water quality problems at the lower end as well as habitat degradation.

The Ecclesbourne is a high quality trout and mixed fishery at its lower end.

The Derwent is a high quality trout fishery at the upstream end gradually giving way to a coarse fishery at the lower end. Table 10 gives fishery survey data for rivers in the area.

Table 10 - Fishery Survey data

River	Site	No of Species	Biomass g/m ²
River Amber	Ogston Hall	4	4.9
	Sawmills	4	<2
	Wingfield Park U/S	2	4.3
	Wingfield Park D/S	4	24.3
	Ambergate	4	15.8
River Ecclesbourne	Puss in Boots	4	11.2
	Windley Meadows	4	5.8
	Duffield	5	5.6

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	Derwent confluence	8	22.0
River Noe	Barber Booth	1	3.3
	Edale End	1	10.3
	Fullwood Stile	3	7.3
	Brough	3	1.4
River Derwent	U/S Yorkshire Bridge	2	9.0
	D/S Yorkshire Bridge	1	2.4
	Carr Bottom Farm, U/S Thornhill	1	0.2
	Carr Bottom Farm, D/S Thornhill	1	0.4
River Wye	Ashwood Park Buxton	1	3.5
	Pavilion Gardens Buxton	1	7.0
	Topley Pike U/S	2	10.4
	Topley Pike D/S	2	3.4
	Millers Dale	2	7.3
	Ashford	3	2.4



Photograph 9 - The fisheries potential of the River Ashop is limited by upstream diversion works (see Issue 6)

Appendix 1 - General Quality Assessment for Water

This appendix provides some of the background details for the water quality section covered in Section 6.3.1 of the document.

Monitoring

The quality of rivers and canals has been monitored and reported for many years. However it was not until 1978 that a formal system was introduced. This system developed by the National Water Council looked primarily at the measurement of chemical indicators of dissolved oxygen, biochemical oxygen demand (BOD) and ammonia, but other information both chemical and biological was variously used by regional water authorities to assess quality. This created inconsistencies across England and Wales which was further complicated by the use of different statistical methods and subjective judgements about the uses of a river or canal.

Clearly a standardised national system was required that could incorporate other standards (ie the EC Surface Water Abstraction Directive (75/440/EEC)). The National Rivers Authority therefore introduced a new scheme, with the intention of separately examining stretches of water in terms of their chemical, biological, nutrient, and aesthetic qualities within a General Quality Assessment (GQA) scheme.

GQA Chemical Assessment

Assessments using the GQA (Chemical) scheme have been made based on measurements taken since 1988. Samples of water are taken on a monthly basis, at routine sampling points covering some 40,000 kilometres of rivers and canals. The chemical scheme - to provide continuity with previous schemes - is also based on Dissolved Oxygen (DO), BOD, and ammonia, with stretches classified into six bands; Good (grades A and B), Fair (grades C and D), Poor (grade E) and Bad (grade F). The grade of a specific stretch is calculated in a standard way across all of the regions, using the combined results for three consecutive years in order to ensure that there are sufficient data to provide a reliable assessment.

The summary of the grade-limiting criteria is given in Table 11. The overall grade assigned to a river or canal reach is determined by the worst of the three grades for the individual determinants.

The grades are defined in terms of 90 percentile for BOD and ammonia and the 10 percentile for dissolved oxygen; in other words, the river reach should contain less than the specified levels of BOD and ammonia for at least 90 percent of the time, whilst the level of dissolved oxygen must not fall below the prescribed level for more than 10 percent of the time.

Percentiles have the advantage that they combine a measure of the general level of a determinant with a measure of variability and hence are able to respond to the large fluctuations in quality common in rivers, as well as indicating the overall quality.

Water quality varies naturally to some extent and there is always a statistical chance that individual stretches will be re-classified wrongly from one year to another, simply because the grading is based on the analyses of 36 separate, instantaneously taken, samples of water. From one assessment to another therefore, some stretches of water are up-graded and others are down-graded. The difference between the two is a precise estimate of the real change in quality, because the statistical changes cancel out in the calculation.

GQA Scheme for Biology

The GQA biological scheme was first introduced in 1995 and reported on last year. This is the first set of figures available using this system.

It is based on the groups (known as taxa) of macroinvertebrates (small animals, eg mayfly nymphs, snails, shrimps and worms) that are found on the river bed. Macroinvertebrates are used because they do not move far, have reasonably long lifecycles, and respond to the physical and chemical characteristics of the river. They can be affected by pollutants which occur only infrequently and which are missed by the spot-sampling procedure used in the chemical GQA scheme.

Table 11 - GQA chemical grading for rivers and canals

Water Quality	Grade	Dissolved Oxygen	Biochemical Oxygen Demand (ATU) (I)	Ammonia
		(% Saturation) 10 - percentile	(mg/l) 90 - percentile	(mgN/l)
Very Good	A	80	2.5	0.25
Good	B	70	4	0.6
Fair	C	60	6	1.3
Moderate	D	50	8	2.5
Poor	E	20	15	9.0
Bad (2)	F	-		-
(1) as suppressed by adding allyl thiourea.				
(2) ie quality which does not meet the requirements of grade E in respect of one or more determinants.				

For GQA assessment, species of macroinvertebrates are linked together into 85 taxa. These are given scores of 1 (for pollution-tolerant taxa) to 10 (for pollution-sensitive taxa). As these different taxa respond differently to pollution, the presence of pollution-sensitive taxa at a site suggests better water quality than the presence of only pollution-tolerant ones. The groups are purely taxonomic - we assume the members of each group have similar pollution tolerance.

By comparing taxa found in the sample with those you would expect to find if the river were pristine, rivers are classified into one of six grades as shown in Table 12.

Sampling and analysis methods

Each stretch of river has a representative biological and a chemical sampling site allocated to it. Although the biological and chemical sites are not always coincident, they are subject to the same water quality and, as far as possible, are not separated by tributaries, discharges, weirs or other potential influences on water quality.

Two biological samples are collected, one in Spring (March - May) and one in Autumn (September - November).

The samples are collected using a nationally standard method incorporating three minutes active sampling with a pond net. At some deep sites this is not possible, so the samples are collected by doing 3 to 5 trawls with a Medium Naturalist's Dredge or by using an air-lift sampler, followed in both cases by a 1 minute sweep with a pond net. Every sample is supplemented by a 1 minute visual search for animals living on the water surface, or attached to rocks, logs or vegetation.

All the samples are analysed in laboratories. The methods used to wash and sort the samples varies, depending on what is most effective in different places (largely determined by the amount of silt or weed in the samples).

A scheme of quality control has been established in every laboratory, to ensure that an average of no more than two taxa are missed. This involves re-inspecting 10% of all samples. There is also a second audit, in which 60 samples from each Region are re-analysed by an independent assessor. This demonstrated that an average of 1.9 taxa were missed during analysis.

Other information collected at the site includes the width and depth of the stream and the percentage cover on the river bed of boulders, gravel, sand and silt. For GQA, all these items are calculated as annual averages. Information supplied from maps includes the grid reference, the slope of the river, its altitude above sea level and the distance of the site from the source of the river.

Table 12 - GQA scheme for biology

GRADE	OUTLINE DESCRIPTION
A- VERY GOOD	Biology similar (or better) than expected. High diversity of taxa, usually with several species in each. Dominance of one taxon rare.
B- GOOD	Biology falls a little short of that expected. Small reduction in pollution sensitive taxa. Moderate increase in individual species in pollution tolerant taxa.
C- FAIRLY GOOD	Biology worse than expected. Many sensitive taxa absent, or number of individual species reduced. Marked rise in individual species in pollution tolerant taxa present, some with high numbers of individual species.
D- FAIR	Biology worse than expected. Sensitive taxa scarce. Pollution tolerant taxa present, some with high numbers of individual species.
E- POOR	Biology restricted to pollution tolerant species with some taxa dominant in terms of the numbers of individual species. Sensitive taxa will be rare or absent.
F- BAD	Biology limited to small number of very pollution tolerant taxa, often only worms, midge larvae, leeches and the water hoglouse. These may be present in very high numbers. In the worst case, no life present.

Allocating a grade

There are two values determined for each sample:

- i) the number of different taxa present;
- ii) the Average Score Per Taxon (ASPT). This is calculated by dividing the BMWP (Biological Monitoring Working Party) score by the number of taxa. The BMWP score is calculated by totalling the weighted score for each taxon. The score is weighted according to the taxon's sensitivity to pollution; the highest score (10) being given to the most sensitive taxa. Low values for the BMWP score generally indicate pollution.

Having calculated these two values, they are compared to those which you would expect to find at a site in a similar, but pristine river. As there is much natural variation due to geology and habitat a mathematical model - RIVPACS (the River Invertebrate Prediction and Classification System) - is used to predict the fauna, from which the number of taxa and ASPT expected in the absence of pollution can be calculated. This model used the physical data, measured both at the site and from maps, to calculate these expected values.

River biological quality is then expressed as ratios of the actual values from sampling compared with the predicted values for both the number of taxa and the ASPT. The ratio is known as the Ecological Quality Index (EQI). An RQI of 1.0 or more indicates that the taxa found in the sample were those expected under conditions of natural water quality. Each EQI (the EQI(N-taxa) and EQI(ASPT)) is then compared with those set for the biological grades (Table 13) and the site assigned the lower of the two grades, if these differ for the two indices.

The divisions between grades show changes in biological quality. The extremes (grades A and F) were set to reflect good and bad quality with intermediate grades set pragmatically between the extremes.

The grading of waters is not precise because it depends on sampling which has, inevitable, degrees of error. It is unusual for this error to extend beyond the adjacent grade and there is a tendency for a pessimistic grade to be calculated because taxa can only be missed, and not added when samples are taken or analyses.

Table 13 - GQA (biological) grades

ECOLOGICAL QUALITY INDEX		
GRADE	i) FOR TAXA	ii) FOR ASPT
A (very good)	0.85	1.00
B (good)	0.70	0.90
C (fairly good)	0.55	0.77
D (fair)	0.45	0.65
E (poor)	0.30	0.50
F (bad)	<0.3	<0.50

Water Quality Objectives

The GQA provides information on the current quality of rivers and canals and through periodic assessment trends can be shown. However the Agency has water quality objectives known as "River Quality Objectives" (RQOs) for all rivers and canals.

Table 14 - River Ecosystem classification : water quality criteria

Class	Dissolved Oxygen % saturation 10 percentile	BOD (ATU) mg/l 90 percentile	Total Ammonia mg N/l 90 percentile	Un-ionised Ammonia mg N/l 95 percentile	pH lower limit as 5 percentile; upper limit as 95 percentile	Hardness mg/l Ca CO ₃ 95 percentile	Dissolved Copper µg/l 95 percentile	Total Zinc µg/l 95 percentile
RE1	80	2.5	0.25	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	30 200 300 500
RE2	70	4.0	0.6	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	30 200 300 500
RE3	60	6.0	1.3	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	300 700 1000 2000
RE4	50	8.0	2.5	-	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	300 700 1000 2000
RE5	20	15.0	9.0	-	-	-	-	-

Class RE 1: Water of very good quality (suitable for all fish species).
 Class RE 2: Water of good quality (suitable for all fish species).
 Class RE 3: Water of fair quality (suitable for high class coarse fish populations).
 Class RE 4: Water of fair quality (suitable for coarse fish populations).
 Class RE 5: Water of poor quality (which is likely to limit coarse fish populations).
 Unclassified: Water of bad quality (in which fish are unlikely to be present), or insufficient data available by which to classify water quality.

Appendix 2 - Organisations who contributed to this Report.

The Environment Agency would like to thank the following people and organisations that responded to the proposed initial Issues for the Consultation Report. The comments made at the time were taken on board and have assisted in the shaping of this document, where appropriate.

Amber Valley Borough Council - Policy and Regeneration Unit
Ashfield District Council - Community Services
ARC Central
Bernhard Metals (UK) Ltd
Biffa Waste Services Ltd
British Canoe Union
The British Horse Society
British Trust for Ornithology
British Waterways - North East Region
Caudwell's Mill Trust Ltd
The Council for the Protection of Rural England
Country Landowners Association
Countryside Commission
Courtaulds Chemicals
Croda Mebon Ltd
Derby City Council - Corporate Services
Derby City Council - Housing and Environmental Services
Derby City Council - Leisure Services
Derby City General Hospital
Derby Rowing Club
Derbyshire Constabulary
Derbyshire County Council - Environmental Services
Derbyshire Dales district Council - Community Services
Derbyshire Dales District Council - Planning Services
Derbyshire Historic Buildings Trust
Derbyshire Wildlife Trust
Derwent Fly Fishing Club
Elastogran
English Nature
Erewash Borough Council - Technical Services Department
Farming and Rural Conservation Agency
Farming and Wildlife Advisory Group
Friends of the Earth - Derby
Mr H George, Whatstandwell
Government Office for the East Midlands
Haddon Estate
High Peak Borough Council - Environmental Health
High Peak Borough Council - Housing and Planning
The Inland Waterways Association
The Institute of Civil Engineers
Laporte Minerals
National Farmers Union - West Midlands Region
North East Derbyshire District Council - Environmental Health
Nottinghamshire Association of Local Councils

Nottinghamshire County Council - Planning and Economic Development
Omya Croxton and Garry Ltd
Pb Batteries
Peak District National Park Authority - Recreation
The Ramblers' Association
Rural Development Commission
Soil Survey and Land Research Centre
Sustrans
Tarmac Quarry Products Ltd
Tidy Britain Group
Yorkshire Water plc - Environmental Regulation

Appendix 3 - Documents and Legislation

Agency documents

An Environmental Strategy for the Millenium and Beyond (Sept 1997)
Green Shoots
Midlands Regional Biodiversity Strategy (Dec 1996)
Policy and Practice for the Protection of Floodplains (Jan 1997)
Policy and Practice for the Protection of Groundwater (NRA, 1992)
Regional Water Resources Strategy (NRA, 1992)
Regional Fisheries Strategy (NRA, 1993)
River Derwent Strategic Landscape Assessment (NRA, Nov 1995)
Hydrometric Report and Catalogue

Other documents

Code of Good Agricultural Practice for the Protection of Water and Farm Waste Management Plans MAFF
"Energy Conscious Planning" CPRE
Regional Planning Guidance for the East Midlands 1994 (reviewed 1996)
"Transformation of a Valley" Brian Cooper, 1991, Scarthin Books
UK Biodiversity Action Plan (HMSO, March 1996)
UK National Air Quality Strategy (UKNAQS) March 1997
PPG Note on Renewable Energy (PPG22) DETR
PPG Note 12 (PPG12) DETR

Parliamentary Acts, Orders and Regulations

Building Act 1984
Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regs 1991
Environment Act 1995
Environmental Protection Act 1990
Environmental Protection (Prescribed Processes and Substances) Regs 1991
General Development and Procedures Order 1995
Public Health Act 1936
Radioactive Substances Act 1993
Town and Country Planning Act 1990
Water Industries Act 1991
Water Resources Act 1991
Wildlife and Countryside Act 1981

Other Government documents

"Making Waste Work - A strategy for Sustainable Waste Management in England and Wales" White Paper
"This Common Inheritance" White Paper, 1990

EC Directives

Dangerous Substances Directive (76/464/EEC)
Drinking Water Directive
Freshwater Fisheries Directive (78/659/EEC)
Habitats Directive
Surface Water Abstraction Directive (75/440/EEC)
Urban Waste Water Treatment Directive (UWWTD) (91/271/EEC)

Appendix 4 - Glossary

Abstraction	The removal of water from any source, either permanently or temporarily.
Abstraction Licence	An authorisation granted by the Agency to allow the removal of water from a source of supply. Statutory; section 38 Water Resources Act 1991.
Agenda 21	A comprehensive programme of worldwide action to achieve a more sustainable pattern of development for the next century. UK Government adopted the declaration at the UN Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro in 1992.
ADAS	Agricultural Development and Advisory Service
Algae	Microscopic (sometimes larger) plants, which may be floating or attached. Algae occur in still and flowing water.
Algal blooms	Rapid growth of phytoplankton in marine and freshwater which may colour the water and may accumulate on the surface as a green scum. Decomposing dead cells consume large quantities of oxygen in the water which may result in the waters becoming anaerobic. Some blooms (such as certain species of blue-green algae) may produce poisons.
Ameliorate	Cause something to become better.
Ammonia	A chemical compound found in water often as a result of pollution by sewage and farm effluents. It is widely used to determine water quality. Ammonia can be toxic to fish.
AMP3	Asset Management Plan 3 is the water company's means of prioritising expenditure on improvements.
AOD	Above Ordnance Datum. Land levels are measured relative to the average sea level at Newlyn in Cornwall. This average level is referred to as "Ordnance Datum". Contours on Ordnance Survey maps of the UK show heights in metres above Ordnance Datum.
AONB	Area of Outstanding Natural Beauty.
Aquatic	Pertaining to the water environment.
Aquifer	A water bearing-stratum situated below ground level. The water contained in aquifers is known as groundwater.
Asset Management Plan	Water Companies Strategic Business Plans - initiated (eg AMP2) by OFWAT as part of the periodic review of water company charges.
Attenuation	Dilute or slow the spread of contamination or the speed of flow.
Base Flow	The flow of a river derived from groundwater sources.
Benzene	Air pollutant from fossil fuels released by vehicular traffic and by industry, carcinogenic. A target pollutant in the UK National Air Quality Strategy.
BOD	Biochemical Oxygen Demand. A measure of the amount of oxygen consumed in water (over 5 days), usually by organic pollution. Oxygen is vital for life so the measurement of the BOD tests whether pollution could affect aquatic animals.
Biodiversity	Diversity of animal and plant life.
Biomass	Total quantity or weight of organisms in a given area or volume.

Borehole	A well sunk into a water bearing rock from which water will be pumped.
Buffer Zone	Strip of land 10-100m wide, alongside rivers which is removed from agricultural use, managed to provide appropriate habitat types and to reduce levels of nitrates and pesticides in water.
1,3 Butadiene	A gas derived mainly from the combustion of petrol and other materials. A carcinogen and a target pollutant in the UK National Air Quality Strategy.
Cadmium	A very toxic heavy metal with a wide variety of uses.
Carbon dioxide (CO₂)	Gas present in the atmosphere and formed during respiration, the decomposition and combustion of organic compounds (eg fossil fuels, wood etc). A greenhouse gas.
Carbon monoxide (CO)	A gas formed by the incomplete combustion of carbon fuels. At very high exposures prolonged exposure to CO can be life threatening. A target pollutant in the UK National Air Quality Strategy.
Catchment	The total area from which a single river collects surface run-off.
CFCs	Chloroflouorocarbons. Volatile but inert (without active chemical or other properties) compounds of carbon and (mainly) chlorine and fluorine. Important greenhouse gases and ozone layer depleters.
Coarse Fish	Freshwater fish other than salmon and trout.
Confluence	The point at which two rivers meet.
Controlled Waters	All rivers, canals, lakes, groundwaters, estuaries and coastal waters to 3 nautical miles from the shore, including bed and channel which may for the time being be dry.
CSO	Combined Sewer Overflow.
Culvert	Channel carrying water across or under a road, canal etc.
Cyprinid Fish	Coarse fish belonging to the carp family, like roach, dace and bream.
Dangerous Substances	Substances defined by the European Commission as in need of special control because of their toxicity, bio-accumulation and persistence. The substances are classified as List I or List II according to the Dangerous Substances Directive.
Derogate (Derogation)	To depreciate or diminish - used in abstraction licensing where a proposed new licence would reduce resources to an existing authorised abstraction.
Discharge Consent	A licence granted by the Agency to discharge effluent of specified quality and volume. Statutory; Schedule 10 Water Resources Act 1991.
DETR	Department of the Environment, Transport and the Regions
Dry Weather Flow	For sewage works, this is calculated by adding estimates of the domestic sewage discharge (which is the population multiplied by the per capita consumption) plus any industrial discharges plus infiltration into the sewer. For rivers, this is calculated as the average of flows during the driest seven consecutive days in each year for the period of record.

EC Directive	A type of legislation issued by the European Commission of the European Union which is binding on Member States in terms of the results to be achieved but which leaves to Member States the choice of methods.
Ecosystem	A functioning, interacting system composed of one or more living organisms and their effective environment, in a biological, chemical and physical sense.
Effluent	Liquid waste from industrial, agricultural or sewage plants.
EH	English Heritage
EN	English Nature
EQS	Environmental Quality Standard. That concentration of a substance which must not be exceeded if a specific use of the aquatic environment is to be maintained.
Eutrophication	The biological effects of an increase in plant nutrients - nitrates and phosphates - on aquatic ecosystems. The result is excess growth of aquatic vegetation due to increased plant nutrients being introduced to the watercourse.
Fauna	Animal life
Floodplain	Land adjacent to a watercourse that is subject to flooding.
Flora	Plant life.
Fluvial	Land pertaining to the river itself.
Gauging Station	A site where the flow of a river is measured.
Greenbelt	A designation used by planning authorities on land adjacent to towns or cities, defined for the purpose of restricting the outward expansion of the urban area and to protect the countryside.
GQA	General Quality Assessment. A national water quality assessment scheme.
Groundwater	Water which saturates a porous soil or rock substratum (or aquifer). Water held in storage below ground level.
Groundwater Units	Administrative sub-divisions of aquifers, defined on geological and hydrological criteria, which form the basis for groundwater resource management and licensing policy decisions.
Habitat	The locality or environment in which a plant or animal species lives.
HMIP	Her Majesty's Inspectorate of Pollution.
Hydrology	The study of water on or below the earth's surface.
Hydrometry	The measurement of water.
Hydrogeology	Branch of geology concerned with water within the earth's crust.
IPC Integrated Pollution	An approach to pollution control in the UK which recognises the need to look at the environment as a whole, so that solutions to particular pollution problems take account of potential effects upon all environmental media. Relates to industrial and commercial

IPC Integrated Pollution	An approach to pollution control in the UK which recognises the need to look at the environment as a whole, so that solutions to particular pollution problems take account of potential effects upon all environmental media. Relates to industrial and commercial processes with a significant pollution potential. Controlled by the Agency defined under the Environmental Protection Act 1990 (Part A).
Landfill	Site used for waste disposal into/onto land.
Leachate	Liquid formed when water reacts with, or leaches from, waste material.
LPA	Local Planning Authority.
MAFF	Ministry of Agriculture, Fisheries and Food.
Main River	The watercourse shown on the statutory 'Main River maps' held by Environment Agency and MAFF. The Agency has permissive powers to carry out works of maintenance and improvement on these rivers.
Nitrogen dioxide (NO₂) Nitric oxide (NO) Oxides of nitrogen (NO_x)	NO ₂ and NO are both oxides of nitrogen (NO _x) produced by traffic and industry. NO ₂ can have an adverse effect on human health, increasing the symptoms associated with respiratory illness. NO ₂ is a target pollutant in the UK National Air Quality Strategy.
Nutrient	A chemical essential for life.
NRA	National Rivers Authority (now part of the Environment Agency).
OFWAT	Office of Water Industry's Regulator of Water Service Companies.
Ordinary watercourse	A watercourse that does not form part of a Main River.
Ozone	Caused by a chemical reaction in sunlight, at lower levels in the atmosphere by oxides of nitrogen and volatile organic compounds reacting to form ozone. The reactions can take days and maximum concentrations occur downwind of urban areas. Affects the respiratory system. A target pollutant in the UK National Air Quality Strategy.
Particulates and PM₁₀	Small particles of matter released from a number of sources. The clean air Acts led to a tenfold decrease in black smoke but new research has shown very small particles can affect the respiratory and cardiovascular systems. PM ₁₀ - particulates below 10µm. PM ₁₀ - a target pollutant in the UK National Air Quality Strategy.
Permeability	The ease with which liquids (or gases) can pass through rocks or a layer of soil.
Pesticides	Substances used to kill pests, weeds, insects, fungi, rodents etc which can have significant harmful environmental effects.
Potable Water	Water of a quality suitable for drinking.
Prescribed Flow	A flow set to protect lawful downstream users and the aquatic environment.
Raw Water	Water in its natural state; before treatment.
Raw Water Transfer	The transfer of water from one resource to another in order to meet or anticipate demand. It is usually part of a scheme such as a reservoir or pipeline.

RE	River Ecosystem. Classification used to measure water quality.
Reach	A length of river.
Renewable Energy	Energy produced from resources which are unlimited or can be rapidly replenished eg. Wind, water, sunlight, wave power or waste.
Riparian	Of, or on, land adjacent to the river.
River Corridor	A stretch of river, its banks, and a varying amount of adjacent land that is affected by the presence of the river.
RQO	River Quality Objective.
Salmonid Fish	Game fish of the Salmon family, for example, trout and salmon.
SAC	Special Area of Conservation. This designation will protect important species and habitats, as defined under the EC Directive on Conservation of Habitats and Species.
SAM	Scheduled Ancient Monument. The key sites nationally for archaeology, designated by the Secretary of State for national Heritage, through English Heritage and CADW. Statutory; designated under the Ancient Monuments and Archaeological Areas Act 1979.
Septic Tank	A tank used for the treatment of sewage from properties without mains drainage. The sewage is settled and some bacterial treatment occurs. Discharge of effluent is usually to a soakaway system.
Sewage	Liquid waste from homes, businesses etc which is normally collected and conveyed in sewers for treatment and/or discharge to the environment.
Sewerage	Means of conveying foul or surface water.
SINC	Site of Importance for Nature Conservation. These are non statutory nature conservation sites of county or regional importance. Designated by County Wildlife Trusts and in some cases EN and Local Authorities.
Siltation	At low velocities water will deposit the material being carried in suspension. The slower the velocity the finer the material deposited. A deposit of clays and silt is very difficult to remove naturally as it required turbulent and high velocities.
Soakaway	System for allowing water or effluent to soak into ground, commonly used in conjunction with septic tanks.
Soft Engineering (Rivers)	River bank works using earth, grass, tree planting, reeds and other natural (soft) materials.
SoS	Standards of Service.
Sough	Drainage tunnels constructed to drain water from lead mines and suppress the natural water table.
SPA	Special Protection Areas. Areas of importance for birds.
Spray Irrigation	The watering of crops by spraying. Can have a high impact on water resources.
SSSI	Site of Special Scientific Interest. The best examples of the national heritage of

wildlife habitats, geological features and landforms; designated by English nature and the Countryside Council for Wales. Statutory; notified under the Wildlife and Countryside Act 1981.

SSWS	Southern Surface Water Sewer.	
STP	Sewage Treatment Plant.	
STW Ltd	Severn Trent Water Ltd.	
Sulphur dioxide (SO₂)	A gas which dissolves in water to give an acidic solution. It is an irritant when inhaled and may cause breathing difficulties. Emissions of SO ₂ can lead to acid rain, affecting ecosystems and water quality. A target pollutant in the UK National Air Quality Strategy.	
Surface Water	Water which flows or is stored on the ground surface.	
Sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.	
SWO	Storm Water Overflow	
Telemetry	River levels, rainfall, temperatures and wind run are recorded on data loggers connected to the telephone network. Information from the recording sites can be automatically accessed from a central point.	
Trade Effluent	Any effluent, except domestic sewage produced in the course of trade or industry, including agriculture, horticulture and research. Surface water run-off which is significantly contaminated by site activities constitutes trade effluent.	
Transfer Station	Waste disposal facility where waste is collected prior to transport to final disposal point.	
Underground Strata	A term used to signify geology under the surface soil layer. If groundwater exists, or if water is being discharged to the ground, the geology underneath the soil layer is known in the various Acts of Parliament as underground strata.	
UWWTD	Urban Wastewater Treatment Directive.	
Water Table	The natural level of underground water.	
Wetland	An area of low lying land where the water table is at or near the surface for most of the time, leading to characteristic habitats.	
UNITS	ppb	parts per billion
	µg/m ³	micro (10 ⁻⁶) grammes per cubic metre
Length	10mm	1cm (equivalent to 0.394 inches)
	100cm	1m (equivalent to 39.37 inches)
	1,000m	1km (equivalent to 0.621 miles)
Area	10,000m ²	1ha (equivalent to 2.47 acres)
Flow	1,000l/s	1m ³ /s (equivalent to 35.31 cusecs)
	1,000m ³ /d	11.6 l/s (equivalent to 0.41 cusecs)
	MI/d	Megalitres per day
	1MI/d	11.6l/s

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.

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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



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