

local environment agency plan

CROAL/IRWELL
CONSULTATION DRAFT
OCTOBER 1998



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**Croal/Irwell
Local Environment Agency Plan
Map 1**

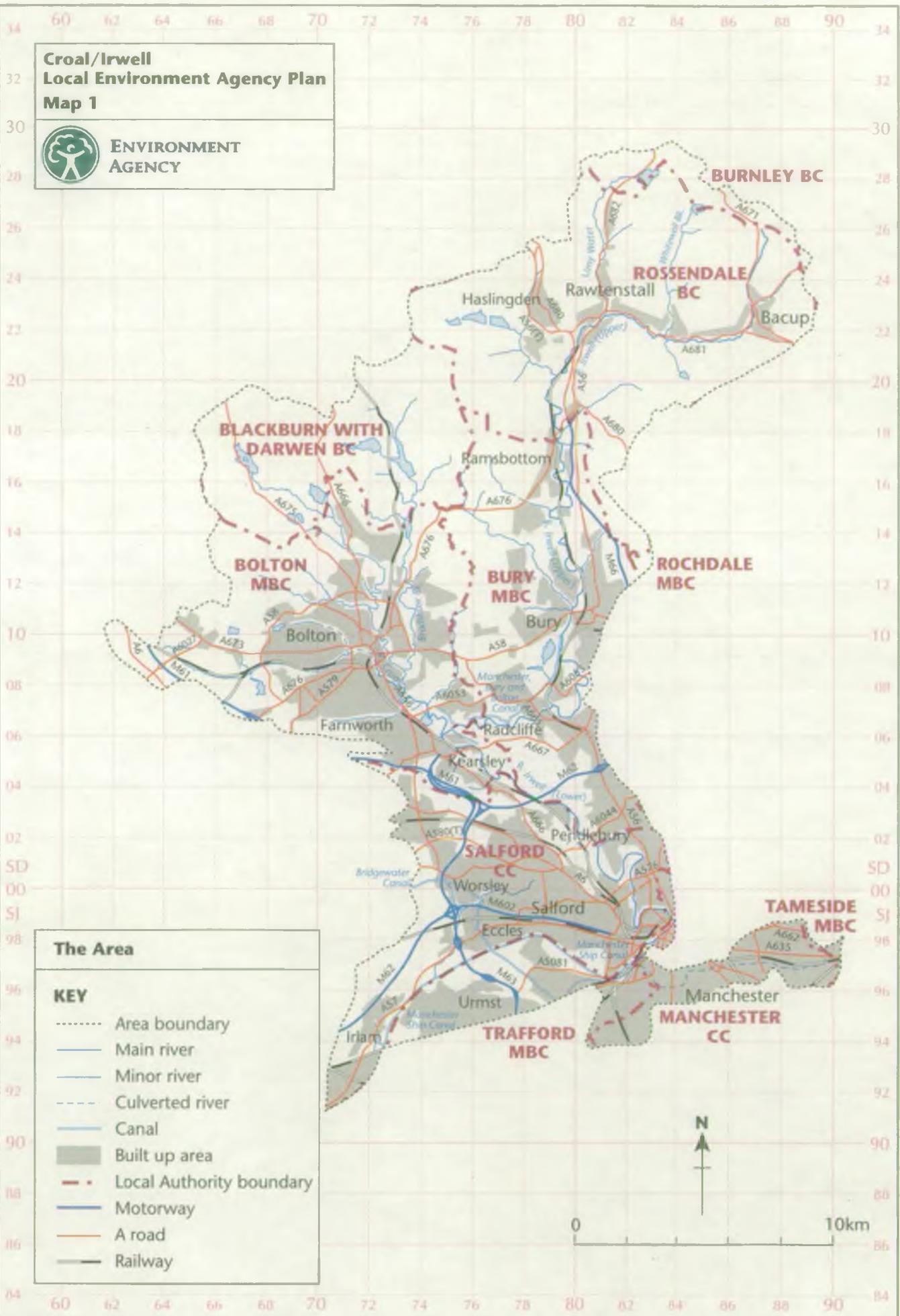


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The Area

KEY

- Area boundary
- Main river
- Minor river
- - - Culverted river
- Canal
- Built up area
- . - Local Authority boundary
- Motorway
- A road
- Railway



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**Environment Agency
Appleton House
430 Birchwood Boulevard
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WA3 7AA**

Foreword

Welcome to our latest Local Environment Agency Plan (LEAP) Consultation Report for the Croal/Irwell area. Our aim is to produce a local agenda of action for environmental improvement which addresses issues which we are unable to solve through our day to day work.

We have attempted to draw together the issues which we believe need tackling to improve your local environment. As the LEAP provides the focus for actions by the Agency, it is important that the issues we have raised relate to our key responsibilities for the regulation of waste, releases to air from some industrial processes and protecting and improving the water environment. However, where issues are raised which do not relate directly to our responsibilities, we hope to influence others to plan and act in ways that support our Environmental Strategy for the Millennium and Beyond.

In order for the LEAP to be effective we need to know your views. We would like to know what you think of the issues raised, whether you would like other environmental issues to be added, and whether you can work together with us to achieve environmental improvements.

This document is only one step in the LEAP process and will be followed by the production of a five year Action Plan in May 1999. We have been fortunate in receiving a great deal of help already from many organisations, groups and individuals who have contributed to meetings, workshops and requests from us for help and information at an early stage. But we would welcome your comments over the next three months to help us produce a Plan that reflects your concerns for the environment.

We look forward to hearing your views.

George Ager
Area Manager
South

The Environment Agency has a vision of "A better environment in England and Wales for present and future generations."

Our Vision for a better environment in the Croal/Irwell Local Environment Agency Plan (LEAP) area is:

- of an area where public access to rivers and canals is no longer restricted by derelict land and buildings but where a network of footpaths, cycleways and bridleways link together to improve recreation, whilst recognising that some areas need to be protected from disturbance to protect sensitive habitats and species.
- of working with local communities and local authorities to combat the problem of fly-tipping and contaminated land, so that the local landscape, canals and rivers, are free from litter and pollution. Less waste would be produced as more people and businesses recycle and re-use materials to manage their waste in a sustainable way.
- of working in partnership with local communities to raise awareness and recognise the source of environmental problems rather than just clearing up the end results. We would aim to work in partnership to develop links with enterprises such as the Upper Irwell Partnership and Local Agenda 21 Environmental Fora so that environmental improvements reflect the needs and wants of the local community.
- of an area where our built heritage is protected and conserved for future generations and the locally distinct landscape character is conserved and where needed enhanced or restored to form an attractive well cared for environment.
- of protecting, enhancing and developing areas of habitat to encourage a wide variety of animals and plants to become established. This would be achieved through working with developers to protect watercourses and adjacent land and through contributing to Local Biodiversity Action Plans to achieve results such as watervoles successfully recolonising watercourses following improvements in water quality.
- of clean rivers, streams and canals, which support a variety of uses while supporting good fisheries and aquatic wildlife.
- of industries where the Best Available Technology Not Exceeding Excessive Cost (BATNEEC) can be successfully used to make all emissions to air harmless.
- of future and existing developments and communities which are protected from flooding by effective flood defence and warning systems. Watercourses will be carefully managed to achieve this and ensure that naturally diverse river corridors are protected. New development will be sited to avoid flooding and open watercourses will be protected along with their floodplain and associated habitats.

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Section 1

The Environment Agency

This section gives an introduction to the Environment Agency and the process of Local Environment Agency Planning.

Our Vision is:

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

Our Aims are:

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

We will do this by:

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

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

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

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

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

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

Local Environment Agency Plans

The Agency is committed to a programme of Local Environment Agency Plans (LEAPs) in order to produce a local agenda of integrated action for environmental improvement. These LEAPs will also allow the Agency to deploy its resources to best effect and optimise benefit for the local environment. These plans will reflect our close contact with industry, the public and Local Government and will contribute towards achieving sustainable development.

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

We will complete public consultation on ten plans by 1998 and on all plans by 1999. We will have started implementing five action plans by 1998 and all of them by the year 2000.

The Local Environment Agency Plan (LEAP) Process

The Agency has embarked on this process to:

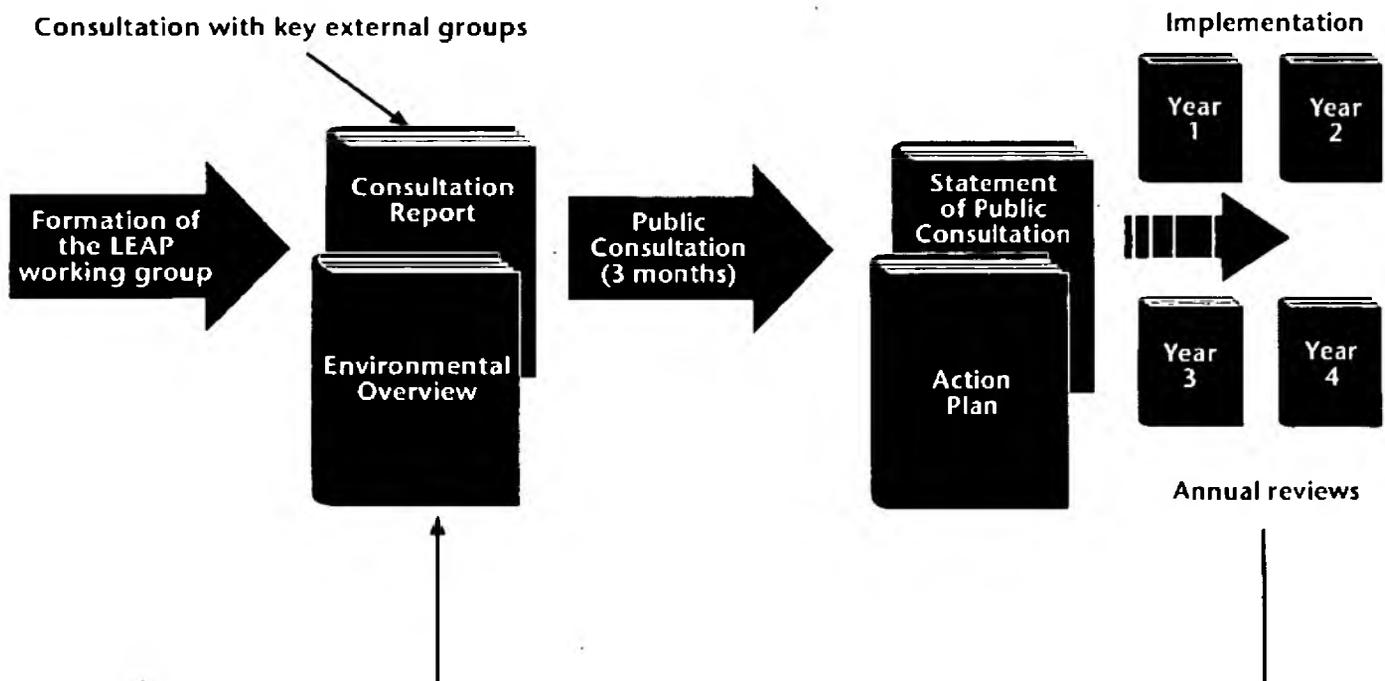
- Be open and accountable
- Develop liaison and partnerships
- Raise awareness of environmental issues
- Prioritise issues and establish plans for improving the areas.

There are three stages to achieve this:

The production of LEAPs within the Agency involves three stages:

- The Local Environment Agency Plan Consultation Report (a separate Environmental Overview, available on request contains background information)
- The Local Environment Agency Plan five year Action Plan.
- The Annual Review.

The LEAP Process



- **Local Environment Agency Plan Consultation Report**

The Consultation Report contains a vision which expresses our long term aims for the Plan area, together with an outline description of the area covered. It also identifies issues and suggests possible options for their resolution. The examples given for each issue are sites where we know the problem exists. They are not prioritised and the list may not include all sites.

The Environmental Overview gives some detail of the area as we see it, its current status, pressures on it and our objectives for the various uses.

The LEAP Consultation Report is intended to form a basis for consultation between the Agency and all those with interests in the area and to build partnerships.

Consultation

The period of consultation lasts for three months. In this time we would ask you to concentrate on the issues that are raised within the Consultation Report and the options for their resolution. **We need your comments by the 1st of February 1999.** Although we welcome comments and corrections on the supporting information, we would prefer consultees to concentrate on the issues. The Consultation Report will not be revised as part of the Plan process. Its purpose is to stimulate thought, discussion and feedback on the issues during the consultation process.

Consultees may wish to:

- Raise additional issues not identified in the Consultation Report.
- Comment on the issues and options identified in the Consultation Report.
- Suggest alternative options for resolving identified issues.

We recognise that many of the issues and options for action identified by the Consultation Report will involve many organisations or individuals. Your views will be crucial to the preparation of the Plan.

- **Local Environment Agency Plan**

The Plan will be published in June 1998, following consultation and will have regard to the comments received. Once produced, the Plan will form a basis for future actions within the area for the next five years and will be a public document. It will detail the nature of actions required, the cost, timescale and responsible organisations. The Agency will be jointly responsible, with other identified organisations and individuals, for implementing the Plan and will therefore be seeking commitment to planned actions by others wherever possible.

- **Local Environment Agency Plan Annual Review**

The progress made with the Plan will be monitored and normally reported annually, by means of the Annual Review document which will be publicly available.

The Annual Review will comprise of a detailed comparison of actual progress made against planned progress. As the LEAP process is a live, interactive process, the Annual Review provides an opportunity to update, reschedule or add in new issues which may have arisen.

Update requirements will obviously depend on the particular needs of the area. However, updates to the LEAP will normally be undertaken every five years.

Constraints

The completed plan will inevitably be subject to some limitations.

To ensure improvements and overcome the problems in the area, actions, which in many cases are the responsibility of other organisations and individuals, will be necessary. The Agency does not have the powers to make the necessary changes, but will use its influence to improve the state of the area wherever possible.

LEAPS and other Plans

The Agency shares the regulation and management of the environment with others. LEAPs intend to compliment and integrate with other organisation's plans such as Local Air Quality Management Plans, Development Plans, Local Agenda 21 Action Plans, Local Biodiversity Action Plans and Water Level Management Plans.

Certain actions will be necessary to overcome issues identified in the LEAP. In some cases, this will require delivery and support of other organisations or individuals. In addition, the Environment Agency is a statutory consultee on certain plans like Development Plans and in our Protection Through Partnership section, planning policy objectives are included to set out approach we feel is necessary to help reduce or prevent further environmental problems in the plan area.

The National Waste Strategy sets out targets for the reduction and use of waste, but the Agency has no powers to require businesses or the general public to reduce waste or use more sustainable methods of waste management. Similarly, the National Air Quality Strategy sets out targets that need to be met, but the Agency has no powers to regulate emissions from motor vehicles, the main cause of air pollution. However, through awareness raising the Agency can encourage and promote the means by which we can achieve these targets in accordance with our Environmental Strategy.

The South Area LEAP Programme

The South Area of the North West Region of the Environment Agency has been split into seven LEAP areas. This plan is the fifth to be produced in the South Area. This area is bounded by three other LEAPs, the Roch/Irk/Medlock, Sankey/Glaze and Mersey/Bollin and they will be produced as Consultation Reports by the end of 1999.

Table 1.1 The South Area LEAP Programme

LEAP Area Report	Consultation	The Plan	First Annual Review
Sankey/Glaze	May 1996	February 1997	February 1998
Lower Mersey	April 1997	October 1997	October 1998
Weaver/Dane	October 1997	June 1998	June 1999
Roch/Irk/Medlock	March 1998	October 1998	October 1999
Croal/Irwell	November 1998	May 1999	May 2000
Tame/Goyt/Etherow	April 1999	October 1999	October 2000
Mersey/Bollin	November 1999	May 2000	May 2001

We would like to hear your views:

- Do you agree with our draft Vision for the Croal/Irwell LEAP area ?
- Have all the major issues been highlighted?
- Have all the options been considered for resolving the issues that have been identified?
- Do you have any comments to make regarding the plan in general?
- Comments on the Croal/Irwell Local Environment Agency Plan Consultation Report should be received by the **1st February 1999**.
- All written responses shall be considered to be in the public domain unless Consultees explicitly request otherwise.
- If you would like further detailed information or would like to comment on this document please write to:

**The Environment Planner
Environment Agency
North West Region
Appleton House
430 Birchwood Boulevard
Warrington
WA3 7WD**

**Tel: 01925 840000
Fax: 01925 852260**



Questionnaire - Your Views Count

The aims of this document are:

- To tell you our vision and proposals for the Croal/Inwell area.
- To ask you to tell us your views and comments on the issues we have raised.

This is your opportunity to tell us what you think.

Please:

1. Answer the quick questions on the next two pages.
2. Write any extra comments on the back of this questionnaire.
3. Pull the questionnaire out of the booklet.
4. Send it to us in the **FREEPOST** envelope provided, even if you have not answered all the questions.

1. How did you first find out about this LEAP?

- Letter from the Environment Agency
- Environment Agency Poster
- Radio
- Environment Agency Display
- TV
- Newspaper
- Other please specify

.....

2. Where did you get this booklet?

.....

3. In which town or area do you live?

.....

4. The vision for this Local Environment Agency Plan (LEAP) area is of a sustainable environment capable of supporting diverse natural species and habitats, providing opportunities for recreational usage and access, and one which is valued by local people. This will be balanced with the need to maintain industry and employment, cater for the areas social needs and the requirements of the population.

Do you agree with this? Yes/No
 If you disagree, please explain why.

.....

5. The Agency's aims in this area are to:

- achieve major and continuous improvements in the quality of air, land, and water.
- encourage the conservation of natural resources, animals and plants.
- make the most of pollution control and river-basin management.
- provide effective defences and warning systems to protect people and property against flooding from rivers and the sea.
- reduce the amount of waste by encouraging people to re-use and recycle their waste.
- improve standards of waste disposal
- manage water resources to achieve the proper balance between the country's needs and the environment.
- work with other organisations to reclaim contaminated land.
- improve and develop salmon and freshwater fisheries.
- conserve and improve river navigation (not in this area).
- tell people about environmental issues by educating and informing.
- set priorities and work out solutions that society can afford.

Please tick the three you think are most important.

6. Are there other key objectives you would like to see included?

.....

7. We have identified the issues within this document. Please circle the five issues that are the most important to you:

- Issue 1 The Need to Protect Groundwater Quality in Trafford Park
- Issue 2 Inefficient Use of Water Resources Causing Adverse Environmental Impacts
- Issue 3 Non-Sustainable Discharge from Belmont Reservoir
- Issue 4 The Need for Continued Habitat Improvement and Protection of Existing Wildlife Habitats to Conserve and Enhance Biodiversity
- Issue 5 The Adverse Environmental Impacts of Non-Native Pest Species
- Issue 6 Lack of Natural River Form and Wildlife Habitats due to Historic Channelisation and Modification of Watercourses

Section 2

Outline of the Area

This section gives a brief introduction to the LEAP Area.

The Croal/Irwell LEAP area is based on the catchment area of the River Irwell and River Croal.

This takes up approximately 468 km² with a population of about 635,000 people. Approximately one third of the area is within the County of Lancashire while the remaining two thirds lie within Greater Manchester. It includes the main towns of Bolton, Bury and Salford, Rawtenstall, Bacup, Haslingden, as well as part of the City of Manchester.

This is a key commercial and industrial area with a long history of continuous settlement dating back to 6000 BC when dense woodland covered much of the land. The arrival of the Celtic Iron Age in 500BC meant the hillsides and valley floors could be cleared of woodland and gradually the area became more densely populated. Manchester was an important town that developed under the Roman occupation when the camp of Mancunium existed. In the late eighteenth century the textile industry took off with the rivers in upper reaches being used as a power source to drive the mills. The introduction of coal and the opening of the Manchester Ship Canal in 1894 opened the way for the growth of other industries.

This legacy has led to structural economic decline and urban dereliction in some locations. It is recognised that the extent of derelict and underused land and the quality of the existing housing stock remains a particularly acute problem. However, urban regeneration programmes and proposals have brought about environmental improvements. Degraded areas, in towns like Bolton and Bury have improved and are being utilised in new ways. Light industry and warehousing is replacing traditional heavy industries to the south while the more rural area to the north has pockets of industrial development, many situated in former mill buildings or purpose built industrial estates. In terms of economic assistance the whole area affords Objective 2 Status for European funding and is an intermediate assisted area under UK legislation.

The area is not all industrial and many different landscapes exist, from pasture and heather moorland dissected by narrow, steep sided valleys to the north, rough grazing and improved pastures dotted with mines, quarries and mill lodges further south, through to flatter, low lying land which is heavily urbanised.

The area also supports some sites of ecological importance, for example, Red Moss Site of Special Scientific Interest (SSSI) within the Croal catchment and Ashclough SSSI within the Irwell catchment. The River Irwell has coarse fishing along the majority of its length from Bury to Manchester City centre whilst coarse fishing also takes place along the lower reaches of the Croal.

Towns are wedged between ridges of sparsely populated flat topped heights that run from north to south. The rivers and the busy motorway network, which dissects the area, share the valleys, whilst to the north lie the unspoilt acres of the Forest of Rossendale and the West Pennine Moors.

Many green corridors, often based on river valleys, extend into the town centres. These are valuable landscape and recreation features which are protected by many local authority policies. The area also has a rich built heritage from the monuments and buildings of the industrial revolution and from the canal system which was of fundamental importance in the areas industrial development. Canals in this LEAP area include the Bridgewater Canal, the Manchester Ship Canal and the Manchester, Bury and Bolton Canal. Canals are also important recreational features and link in to the network of recreational sites, which becomes more widespread in the more open land to the north of Bolton and Bury. Heritage and recreational projects are taking place such as the Irwell Sculpture Trail which follows a 30 mile footpath, and the 'Steam, Coal and Canal' project based around the Bridgewater Canal Linear Industrial Heritage Park.

The Manchester Ship Canal (MSC) is a man made watercourse stretching some 58km from Manchester to the Mersey Estuary at Eastham. It acts as a conduit for the majority of rivers in the Mersey Basin and therefore for the discharges of sewage and industrial effluents. Whilst the water quality of these rivers has improved, further investment is required to meet the long term quality objective of some of these rivers.

The MSC does not act like a normal watercourse because it is deep, steep sided and slow flowing. Determining what is necessary to effect quality improvements in the MSC is a complex issue and it is proposed to develop a mathematical model to determine the impact of various inputs to the Canal and to be able to set justifiable standards on discharges to enable long term quality objectives to be met.



Section 3

Issues and Options

This section details specific issues that have been introduced to the LEAP Area.

This section sets out the specific issues we are raising for this LEAP area. They may be added to within the five year life of this plan following consultation. The issues are set out to give a background to each problem, the effects it has and some examples of where it occurs. The supporting table contains options to rectify the problem, a guide as to who will be responsible for carrying out each option (alone or in partnership) and what we see as the benefits and concerns that go with the option. There may be more than one option for each issue. Some options will be put forward as stages, following on from each other, for example, where information is lacking and there is a need for an investigation before steps can be taken to rectify the problem. Some options identify different ways of addressing the same problem. A 'Do Nothing' option may be appropriate in some cases due to resource or other reasons.

The issues we are putting forward within this LEAP are environmental problems which fall within the areas of responsibility of the Agency (please see Appendix 4). They have been grouped according to the Agency's nine themes as set out in our document "An Environmental Strategy for the Millennium and Beyond" which are:

- 1 Addressing **Climate Change**
- 2 Improving **Air Quality**
- 3 **Managing Our Water Resources**
- 4 **Enhancing Biodiversity**
- 5 Managing our **Freshwater Fisheries**
- 6 Delivering **Integrated River-Basin Management**
- 7 **Conserving The Land**
- 8 **Managing Waste**
- 9 **Regulating Major Industries**

The issues below are numbered to help identification but the order of sections and the issues within them, does not indicate any order of priority.

The issues have been identified by comparing the state of the environment at present with our objectives for its future. The shortfalls identified lead to the issues that need to be addressed. We have also used the knowledge of Agency staff and comments received during early informal consultation with a range of organisations who have an interest in the area, to identify the issues.

There may well be other environmental problems which you would like to see addressed but which are outside the areas of responsibility of the Agency. These will not be addressed as specific issues for action in the LEAP, but may be mentioned in the supporting text. The Agency will seek to have these issues addressed wherever possible by the relevant responsible bodies, through our advisory and liaison roles.

We hope to take forward the issues we have raised to the Plan. The purpose of the consultation period is to gain the opinions of anyone who has an interest or influence in the area on the issues we have raised. We are seeking your comments as to whether new issues are needed, whether all the options for addressing the issue have been suggested, which is your preferred option, which sites should be prioritised and whether you can work with us to achieve the resolution of the issue.

At this stage we have not identified time-scales or costs, we are only highlighting options for addressing the issues. Some issues may not be resolved. Following the three month consultation period on this document we will prepare the Plan. The Plan will contain costings and time scales for each of the options taken forward, as well as identifying the responsible parties and contacts within the Agency.

Issues List

3.1 Addressing Climate Change

No specific issues

3.2 Improving Air Quality

No specific issues

3.3 Managing Our Water Resources

Issue 1 The Need to Protect Groundwater Quality in Trafford Park

Issue 2 Inefficient Use of Water Resources Causing Adverse Environmental Impacts

Issue 3 Non-Sustainable Discharge from Belmont Reservoir

3.4 Enhancing Biodiversity

Issue 4 The Need for Continued Habitat Improvement and Protection of Existing Wildlife Habitats to Conserve and Enhance Biodiversity

Issue 5 The Adverse Environmental Impacts of Non-Native Pest Species

Issue 6 Lack of Natural River Form and Wildlife Habitats due to Historic Channelisation and Modification of Watercourses

3.5 Managing our Freshwater Fisheries

Issue 7 The Need to Understand how to Manage Fish Stocks Under Conditions of Improving Water Quality

3.6 Delivering Integrated River-Basin Management

Issue 8 Impact of Increasing Urbanisation on the Management of the Hydrological Cycle

Issue 9 In-River Structures Causing Flood Risk, Restricted Fish Passage and Migration and Reduced Recreation Use.

Issue 10 Adverse Impact of Contaminated Discharges to the Surface Water System

Issue 11 Adverse Impact From Overflows on the Sewerage Network

Issue 12 Adverse Impact From Industrial Site and Trading Estate Drainage

Issue 13 Adverse Impact of Urban Run-Off and Drainage From Major Roads and Motorways

Issue 14 Contaminated Run-Off From Spoil Heaps and Discharges From Abandoned Mines Causing Pollution of Surface and Groundwater

Issue 15 Properties at Risk of Flooding

Issue 16 Dereliction Adjacent to and Within Watercourses Leading to Increased Flood Risk, Loss of Built Heritage and Decreased Environmental Quality

Issue 17 Sediment Deposition Causing Increased Flood Risk

Issue 18 Culverts Causing Flood Risk and Loss of Habitat

Issue 19 Poor Access to Watercourses for Maintenance Works

Issue 20 Lack of Awareness and Poor Access to Watercourses for Recreational Activities

3.7 Conserving The Land

Issue 21 The Adverse Environmental Impact of Contaminated Land

3.8 Managing Waste

Issue 22 Adverse Impacts of Illegal Waste Disposal Activity

Issue 23 Need to Increase the Awareness of Sustainable Waste Management.

3.9 Regulating Major Industries

Issue 24 Adverse Impact of Discharges From Wastewater Treatment Works (WwTW)

Issue 25 Adverse Impact of Industrial Discharges on Water Quality

Climate Change is an issue that has no boundaries and is truly international in scale. Within a local planning document such as a LEAP it can only be addressed by looking at local contributions to a global problem. Addressing climate change in the UK will require action by everyone, from the Department of the Environment, Transport and the Regions, through the Local Authorities, to business and every member of society. As part of its overall aim of contributing to sustainable development, the Agency is addressing climate change as part of its work. The Agency has set this as one of the key themes in its Environmental Strategy that includes the following objectives:

- Help to ensure that the Government targets to reduce greenhouse gas emissions are met;
- Develop methods to improve our estimates of the emissions 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 in England and Wales and how to manage them;
- Provide improved mapping of low lying coastal 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.

Much of the Agency's existing work and the proposals contained within this plan will help to achieve some of these objectives. For example, we are working to reduce our vehicle use and to improve the efficiency of our vehicles to reduce releases of the gases that contribute to climate change.

However, we have not identified any specific local issues which relate to addressing climate change. As previously stated, many of the issues raised in this LEAP have an impact on climate change. **We would be interested to know of specific issues in this LEAP area which may need raising here.**

Air quality is another issue that knows no boundaries. Its freedom to travel means that problems can spread away from points of origin, although specific problem areas can be created. In a local planning document it is possible to address specific points of origin and problem areas, but it is not possible to address problems coming in from outside the area. On a local scale responsibility for air quality is split between the Agency and Local Authorities. The Agency is responsible for the regulation of major industries, whilst Local Authorities regulate minor industries, control domestic smoke, evaluate local air quality and produce local air quality management plans. As part of its overall aim of contributing to sustainable development, the Agency is addressing climate change as part of its work. The Agency has set this as one of the key themes in its Environmental Strategy that includes the following objectives:

- Help the Government deliver its Air Quality Strategy;
- Ensure emissions from the major industrial processes to the atmosphere are reduced;
- Ensure specific emissions of sulphur dioxide and oxides of nitrogen, which contribute to acid rain are reduced;
- Discourage the use of solvents in industry, which contribute to the production of ozone, the major photochemical pollutant;
- Set an example in reducing emissions from vehicles by reducing our own mileage and increasing the use of public transport.

Parts of the Agency's existing work and the proposals contained in this plan will help to achieve some of these objectives.

Air quality, in most of the area covered by this LEAP, is being investigated by the Greater Manchester Air Quality Management Steering Group. This group is made up of representatives of the Local Authorities within the Association of Greater Manchester Authorities. The Agency has an input to this group and supplies information on processes that we regulate. The Atmospheric Research and Information Centre (ARICs), based at Manchester University, is providing information and interpretation on air quality to the group. Air quality issues within this LEAP area will be addressed by the steering group and therefore, we are not raising any specific issues in this LEAP. We support the work of the group and will continue to provide any information we can.

Issue 1 The Need to Protect Groundwater Quality in Trafford Park

Background

There is a need to investigate the cause and extent of groundwater quality problems and quantify the rate of replenishment to the sandstone aquifer in Trafford Park, in order to develop a sound strategy for dealing with proposals for further development of the groundwater resources.

Historically, the Permo-Triassic sandstone aquifer which underlies the Trafford Park area has been heavily exploited for industrial purposes, from a number of deep boreholes. This has caused a local depression in the water table and upflow of poor quality (saline) groundwater from depth, as businesses have used this resource.

This problem was recognised when licensing controls on abstractions were introduced in the 1960's. Since then there has been a presumption against additional groundwater abstraction in Trafford Park. Over the last two decades there has been an overall reduction in the number of abstractors and abstraction quantities.

The groundwater quality near the surface is of poor quality, caused by contamination from past industrial processes and practices as well as having an elevated iron content, possibly derived from recharge from the Manchester Ship Canal.

Effects

Over abstraction would lead to a continued deterioration in groundwater quality and may also affect the ability of existing licence holders to abstract to the limit of their entitlements. This situation would not be sustainable in the longer term.

Options	Responsibility	Benefits	Concerns
1. Allow additional abstractions through licensing.	Environment Agency	Demand of businesses for groundwater will be met in the short term. No immediate cost implications.	Continued deterioration in groundwater quality Unsustainable use of resources
2. Strategy of allowing no additional abstraction	Environment Agency	Will slow down the deterioration in groundwater quality. No direct cost implications.	Possible problems of rising groundwater: <ul style="list-style-type: none"> • flooding at surface • mobilisation of soil pollutants at shallow depth Withholding potentially usable resources
3. Carry out groundwater resource investigation	Environment Agency	Allows development of a sound groundwater resource management strategy to optimise use of resources. Rate of replenishment to the sandstone aquifer can be quantified.	May limit industrial development.

Issue 2 Inefficient Use of Water Resources Causing Adverse Environmental Impacts

Background

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

Agricultural demand is generally met through direct abstraction from rivers, streams and groundwater. The availability of water from these sources became an issue with the experience of the drought in 1995-96.

Industry uses water from the public water supply system to meet demands. This demand is generated by customers using water and losses through leakage from the distribution network. Historically water has been a cheap commodity for industry.

An unlimited, uninterrupted supply is viewed as a right by domestic consumers. These factors, together with the domestic charging scheme, have contributed to a culture of less than efficient usage of water and little recognition of its true value.

The drought of 1995-96 highlighted this problem and progress has been made to understanding the environmental effects of wastage of water. By introducing waste minimisation, demand management measures and effective agricultural use, the need for water can be reduced.

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

Across the Region North West Water Ltd (NWW) are committed to reducing leakage by 250MI/d by the year 2000. The LEAP area is contained within the Manchester East and Manchester West demand zones, the target reduction in total leakage in each of these demand zones is 30 MI/d by the year 2000. A programme of mains refurbishment, improved management of mains pressure, public awareness campaigns and a telephone 'Leakline' is being carried out by NWW to reduce leakage. A region wide reduction of 300MI/d has already been achieved.

Effects

Depletion of water resources in other areas, such as the Lake District, with associated effects on the environment.

Low flows in rivers and streams exacerbated in summer.

Examples

High demand for potable water supplies in the area during the 1995/96 drought resulted in extra demand being placed on Delph and Clowbridge reservoirs and a potential risk to sustainable supplies.

Demand for water to irrigate golf courses, parks and gardens and sports grounds causes extra pressure on reservoir sources.

Options	Responsibility	Benefits	Concerns
1. Continue to educate and raise public awareness.	Environment Agency. North West Water Ltd.	User Awareness and Reduced Demand.	
2. Continue to reduce leakage to economic levels.	OFWAT North West Water Ltd.	Leakage Reduced. More Effective Use of Resources.	
3. Reduce Domestic Leakage.	General Public. Environment Agency. North West Water Ltd.	Leakage Reduced.	Rating system a disincentive.
4. Introduce and Monitor the effectiveness of Demand Management Measures such as promoting the recycling of water, restricting licensed volumes and promotion of water .	Environment Agency, North West Water Ltd, Industrial and domestic users.	More effective use of resources. Reduced demand which could reduce leakage. Identifies whether implemented measures are reducing leakage & demand.	
5. Promote the efficient use of water resources in agriculture and the leisure industry.	Environment Agency Farming community MAFF, NFU, Sports Council, Local Authorities	Reduction in demand for water increasing its availability for other users and the environment	
6. Review Abstraction Licences	Environment Agency	Identify historic licences causing a potential environmental impact	Compensation would have to be paid to all licence holders affected.

Issue 3 Non-sustainable Discharge from Belmont Reservoir.

Background

Belmont Reservoir at the head of Eagley Brook in the River Croal catchment discharges water (compensation water) at a rate of 15.7 Ml/d to Eagley Brook to meet the needs of downstream users. The requirement to do this is contained within an Act of Parliament (the Bolton Improvement Act 1854). This rate of compensation water discharge is not sustainable during extended periods of below average rainfall. Therefore if compensation water was continually discharged at 15.7 Ml/d, there would be certain years when the reservoir would empty due to inadequate storage capacity with consequent severe adverse impact on the downstream watercourse and on downstream abstractors.

As the reservoir is not used for public water supply purposes, there is a lack of data concerning the exact capacity of the reservoir and the reliable yield of the catchment. These need to be established in order to ascertain a sustainable operating regime for the reservoir and to try to balance the often conflicting needs of downstream water uses as well as the recreational uses on the reservoir itself.

When this has been established then various options can be considered as to how varying operating regimes will impact on the various needs of Belmont Reservoir, Eagley Brook and its users. In the longer term this may result in an application having to be made to vary the original statute. This would need consultation with all affected parties at an early stage.

Effects

Over abstraction would lead to a continued deterioration in groundwater quality and may also affect the ability of existing licence holders to abstract to the limit of their entitlements. This situation would not be sustainable in the longer term.

Options	Responsibility	Benefits	Concerns
1. Establish capacity and reliable yield of reservoir.	Environment Agency. North West Water Ltd.	Provides baseline data for consideration of other options.	
2. Reduce compensation discharge to a fixed amount.	Environment Agency North West Water Ltd	Sustainable compensation discharges in "dry" periods	Potential impact on ecology, recreation and water quality within Eagley Brook, (there will be no impact on existing abstractors).
3. Reducing compensation discharge in stages depending upon the reservoir level.	Environment Agency North West Water Ltd	More provide a more flexible and structured operating regime than at present.	Conflicting requirements of different users. Would not meet expectations of all users.
4. Vary compensation discharge on a seasonal basis	Environment Agency North West Water Ltd	May have beneficial impacts, particularly on water quality.	Conflicting requirements of different users. Would not meet expectations of all users.
5. Do nothing			"Ad hoc" operating regime and existing compensation requirement that is not sustainable.

Issue 4 The Need for Continued Habitat Improvement and Protection of Existing Wildlife Habitats to Conserve and Enhance Biodiversity.

Background

When the UK signed the Convention on Biodiversity in 1992 at the Earth Summit it committed itself, amongst other things, to protect ecosystems and natural habitats and maintain viable populations of species. One of the means of doing this was to develop a national strategy which was endorsed by the Government in 1996. So far action plans have been drawn up for a short list of 116 of the most threatened and declining species and 14 key habitats. A middle list and a long list were also produced. To be implemented successfully these national target will be translated into effective action at a local level through Local Biodiversity Action Plans (LBAPs).

Within the LEAP area the diversity of natural features and habitats, from moorland to meanders, hedgerows to haymeadows, ponds and ex-industrial reservoirs, need to be conserved and enhanced to sustain viable populations of wildlife species. Wetlands, bankside trees, riffles and pools in rivers all contribute to biodiversity.

The Greater Manchester Ecology Unit is currently producing a Biodiversity Audit for Greater Manchester as the first stage of a Biodiversity Action Plan for the area. This will be used along with others in the region to produce a Biodiversity Audit for the North West. The audit will pull together existing records of all plant and animal groups, to identify species and habitats of national and local concern and highlight gaps and deficiencies in the existing data. The audit will be used to set priorities and targets for specific habitats and species.

Until the LBAPs are ready to be implemented there is a need to continue to protect, improve and monitor existing habitats.

Effects

By creating new habitats and removing threats to existing habitats, species will be encouraged to achieve their target distribution and status.

Examples

Species on the short list of globally threatened or declining species in UK Biodiversity Steering Group Report 1995 known to occur in the LEAP area include:

Great Crested Newts

Extensive terrestrial habitat is needed around ponds for feeding and hibernation. This is still found in some of the low intensity farming which characterise the rural fringe. There are several known sites containing this protected species in the study area.

Water Voles

The Agency is the contact point for this flagship species. Recent evidence has highlighted the importance of upland wetland sites as final strongholds for water voles. Significant areas, associated with the upland reaches in particular provide a suitable habitat from which recolonisation could occur when conditions downstream improve. There has been a recent sighting along the Middle Brook corridor on the outskirts of Bolton.

Species on the medium/long list which are relevant to this area include bats, a number of bird species, common frog, common toad, smooth and palmate newts.

Key habitats for which costed action plans will be drawn up in the next three years include canals, ponds and lodges, blanket bog, unimproved grassland, heathland, woodland and hedges. Ponds can have landscape, historic and cultural value as well as providing habitats for a wide range of flora and fauna.

Options	Responsibility	Benefits	Concerns
1. Undertake a baseline survey of key sites and habitats in the study area identified from the BAPs, set targets and establish an appropriate programme of ongoing monitoring.	Environment Agency, English Nature, Greater Manchester Ecology Unit, Museums, Manchester Wildlife Advisory Group, Wildlife Trusts, Natural History groups, Specialists and Recorders.	Identifies levels below which certain habitats should not fall and key habitats needing restoration and enhancement.	Cost
2. Work in partnership with other wildlife organisations to prepare and implement local species action plans for all key wetland and aquatic species in the study area.	Greater Manchester Ecology Unit, English Nature, Environment Agency, Wildlife Trusts, RSPB, Specialist local groups	Allows a more structured approach to conservation management	
3. Encourage species to reach their target distribution and status by creating new habitats and removing threats to existing habitats.	English Nature, Environment Agency, Local Authorities, Wildlife Trusts, BTO/RSPB	Increase biodiversity and allow development of sustainable populations of species	Cost
4. Work in partnership with other organisations to protect and promote the restoration of vulnerable landscape features for example, wetlands and ponds.	Environment Agency, Farming and Wildlife Advisory Group, MAFF, Campaign for the Protection of Rural England, Wildlife Trusts	Preserve landscape quality. Provide habitat for a wide range of threatened species, eg, barn owl, wild flower meadows.	Requires compensation for change in agricultural practices
5. Do nothing			Loss of habitats. Decline of species. Failure to comply to UK's commitment on the "Convention on Biological Diversity"

Issue 5 The Adverse Environmental Impacts of Non-Native Pest Species

Background

Many species of non-native plants and animals now live and breed in the wild in Britain. Some plants have spread from ornamental gardens where they were introduced in the 19th century. Japanese Knotweed and Himalayan Balsam have adapted particularly well to the difficult, often disturbed and polluted, urban environment and have come to dominate stretches of river bank throughout the area. Giant Hogweed is locally common along the Eagley Brook, downstream of Eagley Mills and along the lower berms of the Irwell downstream of the Croal confluence. A discrete colony of Giant Hogweed is also found in the Kirklees Brook area of Bury.

Some exotic plants, sold to increase oxygen levels in ponds and aquaria, have also found their way into water bodies having been discarded or deliberately introduced.

Some animals, such as mink and crayfish, have been introduced to the country and farmed for food or their skins. These have escaped into the wild or been deliberately released and now pose threats to native species.

A booklet 'Guidance for the Control of Invasive Plants near Watercourses' is available from the Environment Agency.

Effects

Native plant species and communities are out competed and shaded by the tall dense stands that Japanese Knotweed and Himalayan Balsam can form. When they die down in winter the unvegetated river banks can become unstable and vulnerable to erosion. This can cause problems to flood defences, for example, at Stacksteads Riverside Park adjacent to the River Irwell, there are problems with Japanese Knotweed and an undermined retaining wall.

Contact with Giant Hogweed can cause severe irritation, swelling and painful blistering.

Oxygenating plants

Still waters such as ponds, ditches and canals are vulnerable to introduced plants such as:

Crassula helmsii - Australian swamp stonecrop (sometimes mis-labelled as *Tilleana recurva*)
Azolla - water fern - is a small, bright red, floating plant.

Effects

Native communities are out competed. Australian swamp stonecrop does not die back in the winter. This increases its competitive advantage.

Large masses may cause de-oxygenation on warm nights resulting in the death of other aquatic organisms, in particular fish. The subsequent decay may also cause deoxygenation and nutrient enrichment contributing to the formation of algal blooms.

High densities of plant growth can impede the flow of water in drainage channels.

It is currently an offence to release any animal into the wild without a licence or to plant or cause to grow Japanese Knotweed and Giant Hogweed in the wild under the Wildlife and Countryside Act 1981. This places restrictions on acceptable methods of disposal of soil contaminated with these plant materials. Advice should be sought from the Environment Agency prior to disposal.

Himalayan Balsam and Crassula helmsii are likely to be added to schedule 9 of the Wildlife and Countryside Act in a forthcoming review.

Examples

- | | |
|---------------------|--|
| Giant Hogweed - | Eagley Brook, Bolton
Kirklees Brook, Bury
R. Irwell, d/s of confluence with R. Croal |
| Japanese Knotweed - | catchment wide problem |
| Himalayan Balsam - | catchment wide problem |

Options	Responsibility	Benefits	Concerns
1. Investigate the occurrence and extent of all non-native pest species in the area.	Environment Agency, Local Authorities, Ranger Services, Landowners, General Public	Scale of problem identified and control programme initiated.	Large area to cover, Resources.
2. Carry out control programmes for Giant Hogweed and where appropriate Japanese Knotweed.	Environment Agency, Local Authorities, Ranger Services, Landowners.	Control further spread. Improve habitat for native species.	Possible re-invasion. Other vegetation is lost when spraying mixed stands.
3. Support the establishment of a Code of Conduct for trade in water plants	MAFF, Environment Agency, English Nature, IFE, Aquatic weed research centre, Garden Centres, The Garden Centre Association	More consistent, responsible and informed approach across the industry, Native habitats protected.	Unlikely to be thoroughly enforced. Voluntary scheme for all but a few species. Some plants spread by contaminated equipment, clothing and natural means anyway
4. Launch a campaign to increase public and commercial awareness of the problems associated with non-native species.	MAFF, Environment Agency, English Nature, IFE, Aquatic Weed Research Centre, Garden Centres, The Garden Centre Association	Enables people to act more responsibly, Native habitats protected, Will reduce deliberate and accidental introductions into the wild, Customers can make more informed choice.	Scale of problem.
5. Investigate the impacts of our own maintenance (flailing etc) and surveying activities on the spread of non-native plant species, and target areas where alternative techniques are possible.	Environment Agency, External Contractors	Reduce further spread along watercourses and from one site to another	Cannot stop spreading altogether due to the invasive nature of these plants.
6. Do nothing			Plants will spread uncontrollably. Native flora will be out competed, River banks will become unstable and more liable to erosion.

Issue 6 Lack of Natural River Form and Wildlife Habitats due to Historic Channelisation and Modification of Watercourses.

Background

Many watercourses in the area have been altered and their river corridors narrowed and modified to the detriment of their wildlife, landscape and amenity value. Originally they were diverted or channelised and weirs were installed to satisfy the water-power needs of industry. They have also been straightened, deepened, widened, and culverted to accommodate urbanisation, reduce flooding and increase their drainage efficiency. Natural erosion has been halted by extensive lengths of bank protection such as walling, piling and the creation of uniform bank angles.

Extensive modifications to the physical characteristics of a watercourse can reduce the ecological value of its bank and channel habitats. The Environment Agency works to protect those remaining areas with green river corridors or geomorphological diversity such as varied channel widths and depths, bank angles, pools, riffles, bar-forms, flow rates and types, and substrate size.

Some of the man-made features such as stone walls and weirs can be of historic or cultural value in their own right. Existing structures should only be removed after extensive consultation with all interested parties.

Although it is not possible, or in some cases, desirable, to recreate totally natural rivers everywhere, in some locations it is possible to rehabilitate them into more attractive features for people and wildlife.

The Environment Agency will work alongside the Local Planning Authorities and individual developers to ensure new developments adjacent to watercourses are designed to protect and where possible, enhance existing features of ecological and amenity interest.

Effects

Modifications and channelisation has produced extensive lengths of watercourse in which there is a lack of geomorphological activity. The natural processes of bank erosion and channel movement have been lost. There is a reduced number of riverine habitats and the speed at which habitats can change and develop has been suppressed.

Poor unattractive uniform watercourses with limited amenity and wildlife value.

The separation of the channel from the floodplain environment has prevented the maintenance and development of channel associated features, and the exchange of sediments and nutrients between the river and the floodplain.

A range of site specific problems relating to the maintenance of delapidated artificial channel dimensions. Siltation and excessive deposition in over sized channels, and a lack of sediment in areas of extensive bank protection, (eg. walling, piling etc.), can result in a poor bed environment.

Examples

The Middle Brook corridor between Horwich and Bolton has been identified as an area suitable for enhancement for recreational and ecological benefits. In partnership with Bolton MBC, it is hoped to recreate features of this previously straightened watercourse, create reedbeds for ecological and water quality improvements, improve public access and increase awareness of the value of the local streams in this area.

Options	Responsibility	Benefits	Concerns
1. Identify, research, prioritise and implement schemes for areas which are suited to enhancement and rehabilitation. Carry out post project appraisal.	Environment Agency, Local Authorities, Groundwork Trusts, Landowners, Universities and Consultancies.	Ability to fully assess and prioritise projects and effectively address problems.	Extent of contaminated land. Cost. Land take issues. Ownership issues.
2. Conduct research to establish more efficient and diverse enhancement and rehabilitation approaches and techniques.	Environment Agency in conjunction with Environmental Consultants and Universities.	Improve methods and tools of enhancement and rehabilitation.	Cost
3. Implement enhancement and rehabilitation schemes.	Environment Agency, Local Authorities, Groundwork Trusts, Landowners.	Restore natural balance to fluvial processes, enhance appearance, biodiversity and wildlife value. Reduced cost of maintenance in the long term	Cost. Unpredictability of funding. Contaminated land.
4. Inform and encourage the owners and users of the riverine environment to enhance and maximise geomorphological diversity, and reduce dilapidation, while fulfilling other aims.	Environment Agency, Local Authorities, Groundwork Trusts.	Encourage sustainable management, gradually improving river habitat quality, without direct intervention.	Slow, and can not guarantee results.
5. Identify existing areas of geomorphological diversity and interest through a co-ordinated programme of River Habitat Surveys.	Environment Agency.	Enable the designation and protection of such rare sites in the area.	Time/Cost.
6. Do nothing			Continued degradation of watercourses and river corridor habitats.

Issue 7 The Need to Understand how to Manage Fish Stocks Under Conditions of Improving Water Quality.

Background

There is a need to investigate the links between water quality improvements and changes in fish populations in order to manage fisheries more effectively. This has wider implications for many watercourses in this LEAP area but initial investigations need to be focused on a stretch of the Lower Irwell and the upper end of the Manchester Ship Canal (MSC).

The upper end of the Manchester Ship Canal (MSC) is subject to a high Sediment Oxygen Demand and has suffered from low summer oxygen levels for each of the past 10 years. Water quality within an eight kilometre stretch of the River Irwell between Mode Wheel Locks and Salford University is subject to heavy organic pollution and has been classed as ranging between General Quality Assessment (GQA) band E and GQA band F. Despite this, water quality in this stretch is improving and for some time fish have been known to inhabit the Lower Irwell. Large catches of good quality fish have been reported (Anglers Mail, Dec 6 1997) and this stretch of the river has become particularly popular with anglers.

The composition of the fish community in this stretch of the Irwell is not known. However, analysis of a small sample of roach has confirmed that the fish exhibit remarkably fast growth rates. In fact, growth can be regarded as being amongst the fastest in the UK.

For fish populations recolonising such water courses the moderate amount of organic pollution, together with a favourable oxygen regime, can result in high fish growth rates. This is because such conditions favour large numbers of invertebrates, such as water hog lice (*Asellus* sp) which fish eat. However further water quality improvements, will favour different invertebrates which may be present in lower numbers. Less food will then be available for fish and their growth rate and chances of survival may be reduced.

A long-term study of the Lower Irwell and MSC has shown that invertebrates are largely absent in the summer months when oxygen levels in the water column fall to very low levels. However, excessive populations thrive during the warmer spring months when oxygen levels are tolerable. Fish in these areas appear to use the invertebrate communities as a productive, if seasonal, food source. However, during the summer months, when the oxygen levels often fall to zero throughout the water column, the fish disappear. In the absence of obvious fish mortalities, the assumption is that they migrate upstream, where oxygen levels never fall below 30%. This implies that fish are able to recognise deteriorating water quality and actually migrate away from areas of low oxygen to those with higher levels.

The area offers an excellent opportunity to study both the ecology of a polluted river, and the impact of very low oxygen levels on a part of that system.

Effects

Without further investigation, the effects of water quality on the migration and production of coarse fish and how these might affect the fisheries will be unknown.

The information gained from an understanding of the process of environmental recovery in urban rivers can be used to initiate new practices and improve existing practices in fisheries management.

Examples

The River Irwell - 8 km stretch between Mode Wheel Locks and Salford University
Upper end of the MSC

Options	Responsibility	Benefits	Concerns
1. Initiate a project to include:- a. investigation of the relationship between organic pollution, invertebrates and fish b. a review of the effects of oxygen concentrations on fish movements c. quantification of the significance of these movements on the fishery d. Investigation of the ways to mitigate against the development of water quality barriers.	Environment Agency Environmental consultants	Gain information that can be used to enhance current and initiate new practices in fisheries management eg development of refuge areas for fish.	
2. Do nothing			Lack of knowledge of how to manage urban river fisheries as water quality improves

Issue 8 Impact of Increasing Urbanisation On the Management of the Hydrological Cycle.

Background

In heavily urbanised areas like the Croal/Irwell area, there are large areas which are impermeable to rainwater such as car parks, pavements and roads. As rainfall cannot infiltrate to the soil, the water has to be removed from the area quickly to avoid flooding. Less water is then available to replenish the soil and groundwaters and flows in watercourses may be reduced.

Source Control Techniques or Best Management Practices (BMPs) aim to collect surface water as close to the source as possible and minimise the impact of development on the hydrological cycle. Examples of Source Control Techniques include car parks and pavements constructed using porous materials such as gravel and porous asphalt which can be adapted to provide underground storage, water from roofs feeding into soakaways and infiltration trenches and grassed depressions known as swales on roadside margins filtering pollutants from road runoff and providing temporary storage for storm water.

Where conventional methods are used to collect surface water, the rapid removal of rain water from roads and roofs can cause "flashy" flooding problems. As more land is developed, the need for flood protection or warning systems will increase.

The flooding of floodplain areas is both natural and desirable. The effectiveness of rivers and floodplains to convey and to store flood water, and minimise flood risks, has been severely altered by development within the floodplain.

It is now recognised that further development within floodplains not only means that the new development is at risk from flooding, but that the risk of flooding to existing properties on the floodplain is increased.

Effects

Urban streams with little or no flow in dry periods and very high flash flows in periods of rainfall. This can cause bank erosion and reduced ecological value of watercourses due to variable flows. This effect can be worsened by poor water quality caused by the operation of stormwater overflows.

Increased surface water runoff will also cause an increase of flow through combined sewerage systems and may cause premature operation of stormwater overflows to watercourses.

Storm situations may cause pollution incidents as pollutants are flushed into watercourses following long periods of dry weather.

The increased risk of flooding of urban areas built in the floodplain.

Reduced groundwater levels due to lack of natural recharge

Examples

This problem occurs throughout the urban development within the LEAP area.

Options	Responsibility	Benefits	Concerns
1. Increase awareness of and support for Environment Agency's Policy amongst Local Planning Authorities and Developers, to control and influence the design of urban areas.	Environment Agency, Local Authorities, developers.	Less input required by the Environment Agency on individual planning applications. More acceptance of our requirements by Planning Authorities and Developers. Reduced development in flood plain areas leading to fewer properties exposed to flood risk.	Additional initial cost. Land take.
2. Continue to: i) Promote methods of source control or Best Management Practices (BMPs) internally and externally ii) Work closely with interested parties to develop understanding and expertise of the issues, iii) Support local and national initiatives.	Environment Agency, Local Authority, NWW Ltd, Developers Highways Agency.	Prevention of problems at source reducing costs of future remedial works. Structures such as ponds and swales can have positive ecological benefits. Development of expertise as more sustainable drainage systems become widespread.	Responsibility for maintenance and safety of some structures eg attenuation ponds. Land take. Sustainable drainage systems are 'new' technology that may not be as effective as existing piped structures.
3. Installation of interceptors or other means of stormwater control, such as swales and attenuation ponds, on new and existing major roads and urban developments.	Highways Agency, Local Authority, Developers.	Protection of aquatic ecosystem and prevention of water quality deterioration. Improvement to the aesthetic and amenity value and fishery potential. Reduction in flood risk. Maintain natural recharge to groundwater.	Cost of installation and maintenance. Additional land requirement.

Issue 9 In-River Structures Causing Flood Risk, Restricted Fish Passage and Migration and Reduced Recreation Use.

Background

Control of water level and regulation of discharges are sometimes necessary for the purposes of irrigation, water conservation, flood alleviation, to provide water for industry and in conjunction with locks for the purposes of navigation.

Most of the structures found in the Croal/Irwell LEAP area are designed to hold water upstream. This can be considered to degrade the natural river environment.

Weirs, sluice gates, locks, culverts and bridges are also vulnerable to silt deposition and the build-up of debris. This can create a potential flooding problem which is increased by the deposition of silt in poorly designed man-made urban channels and culverts reducing the watercourse capacity. This has meant that there is a lot of maintenance carried out on the rivers to remove blockages and silt.

Silt deposits can collect, covering coarse gravels upstream. This is particularly important for brown trout within this area, which rely on these gravels for spawning.

Structures, such as weirs and sluices, can cause major obstructions to the migration of fish and to recreational users including canoeists, oarspeople and the users of other small craft. If fish are restricted from free movement within the river system they are unable to migrate to their spawning areas. This will reduce spawning success and hence fisheries potential and sustainability.

Inappropriate new structures in the watercourse will not be consented by the Agency. Any replacement or renovation of structures should incorporate passes or bypass channels, to allow fish migration and the passage of small water craft therefore enhancing the fisheries and recreational potential.

Occasionally it may be possible to remove the structure altogether. In these cases the historical significance and the overall effect on the river environment, e.g. the beneficial oxygenating effects of weirs, must be considered.

Effects

- Restriction of fish migration and upstream spawning gravels
- Restriction and dangers to recreation users
- Debris collection resulting in poor aesthetic appearance and potential flooding
- Disruption to natural river flow process
- Regular heavy maintenance works causing extensive disruption of watercourses

Examples

Cormar Weir (sometimes known as Holme Mill weir, NGR SD793164) on the River Irwell is dangerous for canoeists. Also, it is impossible to carry a canoe past, due to vertical walls adjacent to the river. However Peel weir, above this (NGR 793 168) does have a canoe pass but the benefits are reduced because of Cormar Weir being impassable.

Downstream of Burrs Country Park. Canoeing restricted by weirs, vertical banks and lack of access points.

Derelict weir on the River Irwell, at Stubbins above Ramsbottom (NGR 793 180) prevents canoeing and restricts amenity use.

Options	Responsibility	Benefits	Concerns
1. Assess the full impact of the Flood Defence Asset Survey, on recreation and fishing activities. Prioritise and carry out possible restoration/enhancement schemes.	Environment Agency, Local Authority, Riparian Owners, British Canoe Union, Sports Council, Angling Clubs, Bolton Canoe Club. British Waterways	Increased variety benefits wildlife, fish and recreational users. More attractive watercourses. Improved aesthetic and amenity value.	Possible extra cost.
2. Investigate and assess the potential to remove weirs eg, replacing them with riffle sections, or install fish/canoe passes.	Environment Agency, Local Authority, Riparian Owners, British Waterways	As Above.	Resources
3. Carry out works to return channels to more natural water courses.	Environment Agency, Local Authority, Riparian Owners, British Waterways	Cost saving due to reduced maintenance costs. Allows development of natural habitat. Improved channel capacity.	Cost of carrying out works. Land take. Insufficient space in urban areas.
4. Do Nothing.			

Issue 10 Adverse Impact of Contaminated Discharges to the Surface Water System

Background

Most modern building developments have separate drainage systems, one for uncontaminated surface water run-off the other for foul water (sewerage). The surface water drainage is piped and discharged to local watercourses and the foul to wastewater treatment works.

Problems occur when foul drainage is either incorrectly plumbed into the surface water pipes or when dual manholes occur. These problems are known as "contaminated surface waters" (CSWs) or "wrong connections". There are also occasions when contaminated liquids are poured down surface water drains.

The identification of CSW problems is undertaken by the Environment Agency, inspections are then carried out with the local authorities to make site occupiers or householders aware of the problem. NWW Ltd receive lists of CSW problems that require rectification.

Effects on watercourse

- Increased biochemical oxygen demand.
- Increase in levels of ammonia.
- Reduction in dissolved oxygen.
- Growths of sewage fungus.
- Reduction, or in extreme cases elimination, of aquatic fauna and flora.
- Poor aesthetic appearance and unpleasant odours.
- Sewage related litter.
- Downstream foaming.

Examples

Kensington Drive, Bury, - a tributary of Elton Brook receives almost continuous pollution from contaminated surface water drainage from an estate of about 600 houses. The contamination is mainly from sink waste and washing machines. The pollution is clearly visible and there is some problem with smells.

Staghills estate, Rawtenstall, - discharges to a tributary of the River Irwell. There are problems from dual manholes on the drainage system that result in pollution of the surface water. There are approximately 300 houses on the system. The discharge causes an aesthetic and odour problem.

Thornhill Drive and Ash Grove, Walkden - Kempnough Brook receives discharges of domestic waste effluent from a surface water drain on Thornhill Drive, about 200 houses in the area. The discharge causes an aesthetic and odour problem.

Broadway Estate, Irlam - the Irwell Old Course has discharges from a housing estate of 200 houses. The contaminated discharge of mainly washing machine waste goes to a fishery. The discharge has a visual impact and can effect the fish present.

Options	Responsibility	Benefits	Concerns
1. Identification of wrong connection problems and prioritisation based on environmental impact.	Environment Agency, Local Authorities.	Identification of the extent of pollution and its resolution.	Cost to Local Authorities.
2. Correction of wrong connections to reduce pollution.	NWW Ltd, Agents, Householders, Industry, Local Authorities.	Improvement in the chemical water quality and aquatic ecosystem. Improved aesthetic, amenity value and fishery potential.	Cost to Local Authorities, Industry, Householders.
3. Raise public awareness of the problem by advice and information in leaflets.	Environment Agency, Local Authorities.	Reduction in number of wrong connections. Improvement in water quality.	Expectations may be greater than can be achieved.

Issue 11 Adverse Impact From Overflows on the Sewerage Network

Background

Within this LEAP area, foul drainage and uncontaminated surface water drainage can be conveyed together in combined sewers to wastewater treatment works. Located on the sewerage network are outfalls known as combined sewer overflows (CSOs), and emergency overflows at pumping stations. These are designed to prevent foul flooding by relieving the system during storm conditions. If this did not occur then the raw sewage effluent would back up the sewerage system and could discharge from manholes onto the road or onto properties. The overflows should only operate when adequate dilution is available in the receiving watercourse, such as during heavy rain storms.

The increase in residential and commercial development has led to greater flows going to sewer. Any new developments will have to be considered with regards to the impact on the sewerage network.

In Greater Manchester, parts of the sewerage system was constructed in Victorian times. Some of the older combined sewerage systems are in poor condition and there is inadequate sewer capacity for the increased flow. This has resulted in more frequent discharges from storm overflows occurring, and sometimes the premature operation of storm overflows. This can cause an adverse impact on water quality and cause littering from sewage.

Many improvement schemes have been identified as part of the capital expenditure on environmental improvements by the Water Service Company. These are known as Asset Management Plans (AMPs). The Environment Agency is involved in the second plan, AMP2, for the years 1995 to 2005 and are at present negotiating with North West water on projects for Asset Management Plan 3 (AMP3), which will follow on from the year 2005.

Over the next few years a number of these schemes will be carried out, if sufficient funding is available.

Effects on watercourse

Temporary increase in organic load,
Elevated Biochemical Oxygen Demand and ammonia concentrations,
Reduction in dissolved oxygen levels for a period of time,
Detrimental impact on the aquatic environment,
Presence of sewage fungus,
Unpleasant odours,
Poor aesthetic appearance due to presence of sewage solids and sanitary materials.

Examples

Watercourses where unsatisfactory combined sewer overflows have an impact and where schemes to rectify the problems are proposed are:-

The River Croal and tributaries including Middle Brook, Captains Clough, Tonge and Blackshaw Brook. The overflows have an aesthetic impact and on some of the tributaries contribute to the failure to achieve the River Quality Objectives.

The overflows to Saltey Brook, Worsley Brook and tributaries including Folly and Kempnough Brooks causes aesthetic problems and have an impact on water quality.

A number of CSOs go to the River Irwell in Radcliffe and Prestwich. The discharges contribute to poor water quality and are aesthetically unpleasant.

Watercourses where unsatisfactory combined sewer overflows have an impact but no schemes are proposed as yet :-

The River Irwell in the Rossendale area, including Whitewell Brook where six unsatisfactory overflows have been identified and Swinnel Brook where presently two unsatisfactory overflows have been identified. Both of these watercourses are designated under the Fish Directive.

In the Lower Irwell and the Manchester Ship Canal, the organic and debris load from overflows contribute to the failure to achieve the River Quality Objective.

Corn Brook is a culverted watercourse that has severe organic pollution some of which comes from discharges from overflows.

Options	Responsibility	Benefits	Concerns
1. Reduce the number of unsatisfactory combined sewer overflows.	NWW Ltd.	Possible achievement of the proposed water quality objective. Improvement to the aesthetic and amenity value and fishery potential. Improvement in aquatic ecosystem and in invertebrate diversity.	
2. Recognise the impact on the network that could be caused by significant new developments taking place. Developers to contribute to cost of sewerage improvements where necessary.	Environment Agency, NWW Ltd, Local Authorities, Developers.	Prevent further capacity problems in the sewerage system and any additional overflows.	Cost to Developer.
3. Evaluate requirements to reduce the impact from remaining unsatisfactory sewer overflows for AMP3.	Environment Agency.	Future achievement of Long term RQOs.	
4. Increase public awareness to reduce the flushing of disposable items. "bag it and bin it" campaign.	Environment Agency, Tidy Britain Group, Women's Environmental Unit, Manufacturers.	Improve aesthetics, reduce littering and sewerage pipe blockages.	Increase waste to landfill.
5. Encourage better source control of surface water run off into the sewerage system.	Environmental Agency, NWW Ltd.	Reduce or attenuate the flow of water in the sewerage system during storms.	Installation and maintenance in older systems.
6. Do Nothing.			Deterioration in water quality and loss of habitats and amenity.

Issue 12 Adverse Impact From Industrial Site and Trading Estate Drainage.

Background

Most incidents of pollution originating from industrial sites and trading estates arise from accidents, negligence, poor storage and the mishandling of oil, chemicals and waste. There has been an increase in the number of trading estates and business parks in the area, some are modern, others are part of old factory premises.

On the more modern sites a common problem that occurs is from wrong connections to the surface water drains. These can consist of wash waters, process effluent, contaminated yard washings, kitchen and toilet wastes. Storage on site can also cause a problem as spillages can occur resulting in substances going to the surface water drains. The storage and disposal of waste materials, if not properly undertaken can cause pollution.

Where units have been converted from older premises and sub-let, the drainage systems have not usually been updated. These older systems are more prone to blockages and leaks.

Effects on watercourse

- Increased biochemical oxygen demand and ammonia levels.
- Reduction in dissolved oxygen.
- Reduction, or in extreme cases the elimination, of aquatic fauna and flora.
- Surface films of oil and grease reducing oxygen exchange between air and water.
- Sewage litter debris and waste materials in the watercourse.
- Growths of sewage fungus.
- Discolouration of the water.
- Unpleasant odours.

Examples

The pesticide Permethrin is present in Cowpe Brook. This has had a significant impact on the fauna of the brook and River Irwell down stream. The source is drainage from Kearns at Waterfoot. Discussions between the Agency and the company are taking place, with the company undertaking redrainage work and changing methods of cloth treatment to reduce the amount of the pesticide used.

At McWhirter Technologies at Bury, spillages to land have seeped into the watercourse. The site is being cleaned up.

Tetrosyl, at Bury, produces car products such as shampoo. A culverted stream passes under the site of this works and any spillages that occur on the site drain to Pigs Lee Brook then to the River Irwell.

Industrial units in Walkden cause pollution in wet weather in Singing Clough Brook.

Spills at industrial estates in the Eccles and Swinton areas have caused pollution of Kempnough and Folly Brooks.

Options	Responsibility	Benefits	Concerns
1. Identify and rectify any site drainage problems.	Environment Agency, Landowners, Occupiers, Local Authorities, NWW Ltd.	Improvement in water quality and aquatic ecosystem. Improved aesthetic, amenity value and fishery potential. Possible achievement of long term objectives.	Cost to Owners/Occupiers.
2. Improve good house keeping on site and introduce emergency procedures.	Environment Agency, Owners/Occupiers.	Improvement in water quality and aquatic ecosystem. Improved aesthetic, amenity value and fishery potential. Possible achievement of long term objectives. Possible long term cost savings for owners.	Initial cost to Owners/Occupiers setting up the measures.
3. Promote the installation of surface water separators or pollution interceptors on outfalls.	Owner/Occupier, NWW Ltd.	Improvement in water quality and aquatic ecosystem. Improved aesthetic, amenity value and fishery potential. Possible achievement of long term objectives.	Cost to Owners/Occupiers, NWW Ltd.
4. Introduce waste minimisation measures.	Environment Agency, Owner/Occupier.	Reduce waste on site, and potential pollution.	Initial Cost to Owners/Occupiers.
5. Do Nothing.			Possible increase in pollution incidents, deterioration of water quality.

Issue 13 Adverse Impact of Urban Run-Off and Drainage From Major Roads and Motorways¹

Background

When the soil is covered with a hard surface, such as a road, car park or roof, rain water cannot filter gradually into the earth to feed ground water supplies or watercourses. The run-off from hard standing areas is quicker and results in an increase in the rate and volume of water going into watercourses via drainage pipes and gullies. In addition the sudden increase in flow gives rise to potential flooding problems and can cause erosion.

Stormwaters drained from roads are often contaminated with oils, grease, de-icing materials, sediments and litter. Pollution from vehicle exhausts have been found in the discharges from road gullies. In studies of road drainage metals such as lead, chromium and nickel have also been recorded.

In dry weather many watercourses suffer from low flows partially because they are not being recharged naturally. There is then less dilution of pollutants from urban run-off and road drainage in the watercourse and the wildlife that depends upon the river suffers.

It has been good practice to install interceptors in commercial developments. Now on many road building schemes the Agency recommends that interceptors are installed to protect watercourses or special sites. Interceptors can also assist in controlling pollution which may occur following an accident.

In some areas with known flooding problems a method of attenuation is required such as underground storage or the installation of flow control devices. Other methods include permeable pavements, grass swales and attenuation ponds. These can provide a vegetative treatment system to control pollution, and become attractive landscape and ecological features.

In general urban run-off and road drainage is localised, however, on some smaller watercourses there are significant impacts.

Effects on watercourse

- Formation of oil or grease films on the water surface .
- Impact on aquatic fauna and flora.
- Reduction in dissolved oxygen.
- Erosion of river banks.
- Increased stormwater flows leading to flooding.
- Discharge of silt and grit to the watercourse.

Examples

Middle Brook and tributaries are contaminated by oils and silts from roads in Bolton.

The River Irwell in a number of sections has surface oils and silts from the M62 and M66 drainage.

Kempnough Brook has discharges from the M62 that contain oil and other contamination from urban run-off.

The Bridgewater Canal suffers from intermittent pollution from the M62 drainage.

Singing Clough Brook is contaminated by oil and urban run-off in wet weather.

Run off from M61 contributes to oil contamination present in Unity Brook.

Options	Responsibility	Benefits	Concerns
1. Installation of interceptors on new and existing major roads and Motorways.	Environment Agency, Department of Transport, Local Authority.	Protection of aquatic ecosystem and prevention of water quality deterioration. Improvement to the aesthetic and amenity value and fishery potential.	Cost of installation and maintenance.
2. Install other means of stormwater control such as swales, attenuation ponds or storage.	Environment Agency, Local Authorities, Developers, Highway Authority.	Protection of aquatic ecosystem and prevention of water quality deterioration. Improvement to the aesthetic and amenity value and fishery potential.	Cost of installation, maintenance and additional land requirement.

Note¹ This issue links with Issue 3 'The Impact of Increasing Urbanisation on the Management of the Hydrological Cycle'.

Issue 14 Contaminated Run-Off From Spoil Heaps and Discharges From Abandoned Mines Causing Pollution of Surface and Groundwater

Background

Ochre is a reddish brown suspension caused by the oxidation of iron minerals. Such ochreous suspensions have a high aesthetic impact through discolouration and can also inhibit respiration in aquatic invertebrates. It coats the river bed, filling the gaps between stones, destroying the habitats of invertebrates and the spawning grounds of fish.

In addition to iron, ochreous discharges may contain other toxic metals which will also have a detrimental effect on the aquatic ecosystem.

Ochre pollution is often associated with old mines and spoil heaps. When mines are closed, water may flood the workings, discharging either to groundwater or to the surface water system. The number of small abandoned mines and tip sites in the area is quite high, particularly in the upper reaches of the Irwell catchment.

Currently, landowners and former operators of abandoned mines causing pollution are exempt from key legislative controls and are not liable for clean-up costs. The Environment Act, 1995, introduced some improved measures to deal with mines abandoned in the future.

A national table of sites has been produced and money may be made available to remediate some of them. A study of some of these sites has been undertaken to assess the impact of the mine drainage and how to rectify the situation. Within this LEAP, Deer Play and Old Meadows mines are in the top ten of the national table. Spoil heaps are not included in the national scheme but an assessment of their impact is to be undertaken for future use.

Effects

Ochre covers the bed of the stream inhibiting the growth of plants and insects.
Toxic impact from metals.
High acidity.
Reduction or in extreme cases elimination, of aquatic fauna and flora.

Examples

Old Meadows mine discharges to the River Irwell, remediation of the site will start this year.

Deer Play Moor Mine seepages from slag heaps and mine water discharges. The main discharge from this old mine goes to the River Calder, however, spoil heap leachate and seepages from the mine also go to the River Irwell. Remediation plans for the site will include the discharges to the River Irwell.

New Town Colliery has an impact on Slack Brook, proposals for remediation are being considered as part of the LIVIA Clifton Valley project.

Duke of Bridgewater Mine has an affect on the Bridgewater Canal.

Options	Responsibility	Benefits	Concerns
1. Investigate the possible resumption of minewater pumping and treat to required standards.	Owner/Operator, Other Agencies.	Reduce pollution and improve the environment. Improve aesthetic, amenity value and fishery potential.	Cost to Owner Operator. Not enforceable under current legislation.
2. Provision of on site treatment for minewater discharges.	Owner/Operator.	Water Quality improvement. Enhancement of fishery and amenity potential.	Cost to owner. Difficulty in establishing liability.
3. Restoration and redevelopment.	Owner, Developer, Local Authorities.	Water Quality improvement. Enhancement of fishery and amenity potential.	Cost to Owner or Developer. Viability of end use of site.

Issue 15 Properties at Risk of Flooding

Background

The Environment Agency aims to reduce the risk to people and property of flooding from rivers and the sea. Due to urban developments having extended into the floodplains in the LEAP area, there are a large number of properties which are at risk from flooding or are protected by flood defences.

The majority of existing flood defence works were constructed by and for the benefit of the riparian owners. They are responsible for maintaining these works so that they do not increase the risk of flooding to others. Where actual flooding has occurred the Environment Agency will investigate the causes of the flooding and consider exercising its permissive powers to reduce the flooding risk.

In assessing whether the risk of flooding is acceptable or not, the land use i.e. density and type of development, and how often flooding is predicted to occur, is taken into consideration. The majority of "Main River" in this LEAP area passes through either "high density urban" or "medium density urban" areas where the target flood defence standards are for predicted flooding to occur only for 1 in 100, or 1 in 75, year flood events respectively. Where these minimum standards are not achieved the Environment Agency will consider the three following possible courses of action;

- Improvements to flood defences.
- Implementation or alteration of a maintenance plan.
- Development of Flood Warning Procedures for the affected area.

Possible courses of action are assessed by considering the "benefits" of each, in terms of prevented flood damages against the costs associated with implementing the action, together with the environmental impact of each. Priority is given to actions where the greatest benefit/cost ratio will be achieved. In certain circumstances the Environment Agency may take no action. e.g. where a small number of properties are affected and insufficient benefits exist or where unacceptable environmental damage cannot be avoided.

Within the LEAP area the existing maintenance regime consists of both planned and emergency works which are undertaken to maintain current levels of service and minimise the impact of blockages and failure of defences. It involves works such as desilting, screen clearing and vegetation control. Individual maintenance activities are constantly reviewed to ensure that the benefits achieved exceed their cost, appropriate prioritisation of the available resources and any adverse effect on the environment is minimised.

Protection of the floodplain from inappropriate development proposals is achieved by encouraging Planning Authorities to restrict development in floodplains. To assist in the Planning process the Agency has developed a policy document "Policy and Practice for the Protection of Flood Plains" and will provide flood risk maps to Planning Authorities in the near future.

Effects

Threat to life and property due to flooding, with consequential cost to society.

Examples

Within the LEAP area there are a number of known flooding problems. These will be investigated with a view to the implementation of an improvement scheme, maintenance plan or flood warning procedure.

The following identified problems require a pre-feasibility study:

- River Irwell, Irwell Vale/Lumb/Strongstry/Stubbins
- Blackshaw Brook, Breightmet
- Deans Brook, Smithills Mill

Options	Responsibility	Benefits	Concerns
1. Investigate flooding problems and identify appropriate course of action (i) Improvement Works (ii) Maintenance Plan (iii) Flood Warning Plan (iv) Do Nothing.	Environment Agency, MAFF. Environment Agency.	Prioritisation of Flood Defence Budget. Integrated approach to Flood Defence. Achieve best value for money and the environment.	
2. Consider implementing capital, maintenance and flood warning programmes.		Raised flood defence standards of protection for those most at risk.	Limited resources.
3. Do Nothing (action not justified).		Reduced cost to the Environment Agency.	Properties will continue to be flooded.

Issue 16 Dereliction Adjacent To and Within the Watercourses Leading to Increased Flood Risk, Loss of Built Heritage and Decreased Environmental Quality

Background

The Coarl/Irwell LEAP area has a long history of continuous settlement dating back to 6000BC. In the nineteenth century it was the birthplace of the Industrial Revolution with the rivers in upper reaches being used as a power source to drive the mills. This industry moved down the valley with the introduction of coal. Although no longer needed as a power source industries still concentrated on the river banks as the water was used as a raw material, typically in dye and bleach works and the river as a waste disposal system. This has led to a wealth of industrial heritage. Some of this has been well documented and researched and is protected. However, over much of the area there are many known sites that have not been adequately recorded while the concentration of records in surveyed areas indicates that there are many sites waiting to be discovered in the unsurveyed areas.

Many of these sites are deteriorating as a result of the natural processes of ageing, erosion or development for other uses. Such dereliction makes the waterside environment look unattractive and reinforces the public perception that rivers in urban areas are of little amenity, recreational or ecological value. Due to the lack of maintenance many of these features are now derelict and present a flood risk problem. Many of the structures which act as flood defences are beyond economic repair and will need to be replaced by the Agency, or the riparian owners, at considerable cost. Other derelict structures that impede flow by falling into the river increase maintenance costs as they need to be removed.

Some man made river features like weirs and flood defence structures may be of archaeological significance. The significance of these features is needed for consideration when planning maintenance or renewal or when designing new flood defence schemes.

Unless the land is contaminated the Agency may have little statutory power to address derelict land adjacent to the river. It is important that the Agency encourages others to redevelop land sensitively and to a high standard as necessary, in compliance with land drainage byelaws. Clean rivers will not be appreciated if they flow through derelict and degraded landscape. With major improvements in river water quality rivers are no longer open sewers.

Effects

- Increased risk of flooding.
- Increased costs associated with maintenance.
- Unattractive environment.
- Loss of potential economic investment.
- Poor adverse public image of rivers.
- Loss of recreational opportunities.
- Loss of ecological improvement opportunities.
- Loss of built heritage.
- Loss of local character and distinctiveness.
- Restriction of fish migration.

Examples

There are large areas of derelict land that affect the quality of the river environment. Some specific examples include Eagley Mills, Bolton on Eagley Brook, Holden Wood Works, Holcombe on the River Ogden, Weir Mills, Weir, Bacup and Ilex Mill on the River Irwell.

In these areas the Agency is working with others to secure environmental improvements. Clifton Valley is an example of an area of degraded, old industrial landscape where the Agency is supporting the work of the Lower Irwell Valley Integrated Action (LIVIA) project in partnership with the Groundwork Trust and Salford City Council. The project includes landscaping of open sections of Slack Brook.

The Agency does not have a register of assets on the Sites and Monument Record (SMR) or a list of historically interesting river structures. However, given the duration of industrial development in this area it is likely that there are many features of historic interest. An archaeological investigation of the River Ribble commissioned by the Agency and published in June 1997 increased the SMR fourfold. A study here may produce similar results.

Bury MBC has been relatively well surveyed and has a large number of sites on the Sites and Monument Record (SMR). The adjoining Bolton MBC has comparatively few SMR entries. This is likely to be a result of intensity of survey rather than an actual paucity of historic sites.

Some of the recognised sites are deteriorating. In adjacent areas there is evidence of late Iron Age/Romano-British settlements occupying spurs and the inside of meanders that are being undercut by river erosion. At Radcliffe East (NGR SD797068) wooden stakes were revealed in the 1950s during gravel extraction and now more timbers are being revealed on the outer bank of a River Irwell meander.

There are approximately ten roads in the Manchester area which may reveal timber bridge remains wherever they crossed the area's rivers. Additionally, a river may expose remains of the road itself through the process of meandering over the last 2000 years.

There are many medieval corn mill sites and 18th and 19th century textile mills associated with the rivers. Some of these survive as standing buildings but others are only left as below ground remains which are vulnerable to river erosion. Some of these sites are known but there may be many others that are hidden.

There are also many examples of old crumbling walls and culverts and other structures which are an eyesore as well as potential flood hazards:-

- The dilapidation of some riverbank retaining walls is so bad that collapse is possible. This would cause blockage, loss of ground and slope instability affecting highways and property. Shoring has been erected to resist further bulging of retaining walls, for example at Whitewell Brook and the River Croal in Bolton town centre.
- There are numerous derelict weirs on the River Irwell. Many of these are of timber construction and are at the end of their useful life. A typical example is the weir at Rawtenstall; failure of this could affect the stability of the adjoining public highway and gasholder. Any reconstruction works should incorporate fish and canoe passes, with consideration given to conversion to riffles.
- Bed erosion has undermined a riparian flood defence wall at Limy Water which was rebuilt by the owner. Stacksteads Riverside Park Group have highlighted the need to repair an undermined retaining wall and remove demolished building debris from the River Irwell as part of their project 'Our Greener Valley' which aims to transform the river corridor in Stacksteads.

Options	Responsibility	Benefits	Concerns
1. Recommend improvements in amenity value in planned public or private developments.	Environment Agency, Local Planning Authorities, Developers, Groundwork Trusts.	Improvements achieved at no extra cost to the Agency.	Improvements achieved slowly as piecemeal redevelopment occurs.
2. Develop strategies for redevelopment.	Environment Agency, Local Authorities, Developers.	Overall strategy agreed with Local Authority and incorporated in the Development Plan.	Needs investment in time by Agency staff.
3. Achieve improvements in riverside dereliction through partnerships with developers, Local Authorities, Groundwork Trusts and Landowners.	Environment Agency, Local Authorities, Developers, Groundwork Trusts, Landowners.	Improvements become an integral part of redevelopment. Proactive role by the Agency. Conservation of historic features.	Partnerships difficult to establish.
4. Archaeological survey of built heritage to assess importance.	Environment Agency, Greater Manchester Archaeological Unit (GMAU).	A strategic approach to repairs. Important structures are protected and not destroyed. Important sites are recorded even if they cannot be saved.	Cost. If too extensive the report may not be widely understood or used.
5. Assess historical importance of structures to be repaired as needed.	Environment Agency, GMAU.	Important structures retained.	Delay to the repair works.
6. Achieve structural improvements to walls/structures through alliance with riparian owners.	Environment Agency, Riparian owner.	Cost effective to repair before collapse.	Alliance difficult to establish. Cost to Agency. Inability to pay by riparian owner.
7. Achieve structural improvements to walls/structures by enforcement.	Riparian owner.	Cost effective to repair before collapse.	Opposition to proposals. Inability to pay.
8. Do nothing.		No survey cost.	Increased maintenance costs and flood risk. Riverside environment deteriorates and historically important features may be lost. Structural failure of adjoining property and highway.

Issue 17 Sediment Deposition Causing Increased Flood Risk

Background

The transportation of cobbles, gravels, sands and silts downstream by rivers is a natural process which occurs as a result of catchment run-off and erosion of the river channels by moving water. As a consequence of urbanisation increasing water run off and altering natural channel form, the peak flows and velocities of rivers are greatly increased as are the rates of erosion and sediment deposition.

Sediment deposition gradually reduces the capacity of a river channel to convey flood flows thereby decreasing the standard of flood protection to adjoining properties. Consequently, to maintain existing standards of flood protection it is necessary to remove sediment deposition. This is an extensive problem throughout the LEAP area requiring regular heavy machine excavation work.

The removal of sediment from river channels is both expensive and ecologically damaging as long lengths of river can be affected. There are a number of ways to reduce sediment transfer along rivers and thereby minimise the need for excavating. In moving from a "reactive" to a "managing" approach to sediment transfer and deposition it is necessary to investigate and monitor catchments so that understanding is gained of the relative extent of the problem, its distribution through a catchment, and how it varies through time and with changes in flow.

There is potential to raise awareness to Canal owners of the practices used within the Sustainable River Management project to reduce Canal maintenance caused by sediment deposition. This would reduce bankside erosion with a subsequent reduction in sediment deposition and the costs of its removal. A similar initiative would need to be set up between owners of Canals and owners of adjoining land.

Effects

Deposition of silt, sand and gravel in urban river channels and culverts reduces capacity and increases the risk of flooding.

Periodic maintenance works to remove sediment is expensive and causes extensive disruption to river wildlife during operation, and indirect disruption to wildlife over a longer period, as a flat bed is produced removing the variation in form upon which the habitat diversity of the river bed is dependent.

Examples of locations where accelerated erosion occurs

Only isolated locations are currently known. These include Alden Brook, Musbury Brook, Upper Irwell, River Ogden and River Tonge.

Examples of locations of trials at sediment control

Doe Hey Brook, Bolton.

Examples of locations where recent maintenance works have removed deposits and which will require future maintenance on 2-10 year cycles

River Irwell - Bury to Radcliffe
Astley Brook (Dean Brook), Bolton
Kirklees Brook, Woodhill
Limy Water, Constable Lee, Rawtenstall
River Tonge
River Croal
Middle Brook

Options	Responsibility	Benefits	Concerns
1. Construct silt traps at appropriate locations to simplify maintenance works to remove natural deposits.	Environment Agency, Riparian owners.	Reduced impact of maintenance activities on river wildlife. Reduced siltation of fish spawning areas and weedbeds. Reduced maintenance expenditure.	Initial capital cost. Visual impact. Fisheries impact. Maintenance costs. Limited success. Loss of downstream bed and bank replenishment.
2. Identify and control areas of severe erosion through application of sustainable river management techniques, for example, by fencing off over grazed stretches in rural areas.	Riparian owners, possibly aided by Agency, FWAG.	Reduced impact of maintenance activities on river wildlife. Reduced maintenance expenditure.	Initial aided funding. Need agreement of riparian owner. Loss of downstream bed and bank replenishment.
3. Increase low flow velocities and reduce sediment deposition, for example, by introducing two stage river channels.	Environment Agency.	Reduced sediment deposition, maintenance costs and damage to wildlife. Increased habitat diversity .	Initial capital costs. Need agreement of riparian owner. Cost of land take. Loss of downstream bed and bank replenishment.
4. Strategic catchment approach ie, identify worst affected areas and determine most effective solutions.	Environment Agency.	Most effective solutions to worst affected rivers with consequential reduction in maintenance costs and wildlife damage.	Cost of studies. Experimental trial and error approach can be costly.
5. Do Nothing.		No additional capital expenditure.	No change to the existing situation, ie, high maintenance cost and damage to the river habitat.

Issue 18 Culverts Causing Flood Risk and Loss of Habitat

Background

Within the LEAP area approximately 16km (8%) of watercourse has been enclosed by culverts. The majority of these culverts were constructed during the period of rapid urbanisation during the nineteenth and early part of the twentieth centuries. The presence of these culverts affects the land drainage system and its ecology in the following ways:-

- Culverts present a barrier to wildlife. This is caused by a lack of light, unnatural channel beds, and the interruption of river channel banks. The result is a detrimental environment for fish, aquatic plants, invertebrates and mammals.
- Culverts fragment the natural river corridor producing gaps in open water, river bank and valleys. As well as having an adverse effect on ecology this reduces the amenity value of the watercourse and therefore its value to the general public. As a consequence the remaining open lengths of watercourse become vulnerable to further unsympathetic development.
- Long culverts can have numerous surface water drains connected into them, serving large areas of the catchment. The water entering a culvert can become contaminated and the inaccessibility of the drain outlets makes investigation of the pollution difficult.
- Culverts increase the risk of flooding due to the occurrence of blockages, collapse due to structural decay and insufficient hydraulic capacity. To reduce this risk requires the provision of debris screens and the regular clearance of silt and debris from within culverts and inspection of the structural integrity.

Responsibility for maintaining culverts lies with the riparian owners. However, due to the difficulty in identifying ownership and ensuring that obligations are fulfilled, the Environment Agency, under its permissive powers, inspects and cleans culverts and debris screens on a best endeavours basis, as resources allow, to reduce the risk of flooding to adjoining properties. This represents a significant maintenance expenditure.

Watercourses have been culverted to allow construction of canals and railways. Some railway routes have been dismantled and the land sold. Responsibility for the culvert then transfers to the riparian owner from a public body. The legality of ownership of culverts below canals (and thus maintenance liability) is unclear and should be resolved conclusively before remedial works are needed.

There are instances where pipelines are laid inside culverts thus reducing the hydraulic capacity and increasing the risk of flooding. There is also the possibility for pollution if the pipe is carrying effluent and bursts.

The Environment Agency maintains a database of "Main River" culverts which are greater than 30 metres in length. Within the area there are at least 99 of these culverts totalling approximately 16 kilometres in length.

Any culverting of a watercourse, or the alteration of an existing culvert requires the Agency's consent. In considering new development proposals an Agency objective is to retain open watercourses with a corridor of open land on both sides. This maintains a flood channel and creates a valuable environmental feature. The Agency, therefore, will approve an application to culvert a watercourse where there is a demonstrable need, no practical alternative and where there is minimal impact on habitats.

When sites over a culverted section of watercourse are proposed for redevelopment, the Agency endeavours to promote the reopening of the watercourse to provide a landscaped and attractive water feature. Although it is difficult and expensive to remove culverts which are deep underground, or where waste material has been placed over them, there are many other culverts that could be removed for the benefit of wildlife and the local environment. The most suitable are those below uncontaminated previously developed areas where the planning use has been redesignated as green zone, where the new channel could meander naturally and be landscaped attractively. Opportunity should also be taken to open up formal concrete channelled sections. A recent reclamation site at Bull Hill, Great Lever, Bolton has reopened and diverted the most downstream section of Doe Hey Brook.

Effects

- Loss of river habitats.
- Fragmentation of the river corridor and its amenity value.
- Difficulty in controlling pollution.
- Increased risk of flooding due to blockages.
- Provision of debris screens and regular maintenance works required to maintain standards of flood protection.
- Need for regular structural inspection and repair to maintain structural integrity.
- Maintenance liability falling on the Environment Agency due to difficulty in identifying riparian owners and enforcing them to fulfil their obligations.

Examples of watercourses where culverting causes a flood risk

Culverts on the following watercourses provide insufficient hydraulic capacity and consequently cause a flood risk :-

- Captains Clough Brook, Bolton
- River Croal, Bolton
- Riding Gate Brook
- Worsley Brook, Eccles
- Bessy Brook, West Bolton

Culverts on the following watercourses contain internal pipelines reducing the hydraulic capacity and increasing the risk of blockage :-

- Blackshaw Brook, Bolton

Options	Responsibility	Benefits	Concerns
<p>1. Continue to refuse consent to restrict culverting except for access purposes and special circumstances. Seek to open up culverts during redevelopment where opportunities arise.</p>	<p>Environment Agency, Local Authorities, Developers, Riparian owners.</p>	<p>Reduce extent of new culverting. Gradual reduction in existing old culverts.</p>	<p>Cost of opening up culverts. Reopened watercourse may be unattractive due to legacy of industrial contamination.</p>
<p>2. Identify possible river restoration schemes, where culverted watercourses can be reopened. Promote & implement schemes.</p>	<p>Environment Agency, Local Authority, Developers, Riparian owners, Groundwork trusts.</p>	<p>Reduced flood risk. Improved pollution detection, wildlife habitat, amenity value and awareness of watercourse.</p>	<p>Cost and availability of resources.</p>
<p>3. Undertake investigations of pipeline crossings within culverts, identify and remove where possible. Discourage construction of new pipelines within culverts.</p>	<p>Environment Agency, Local Authorities.</p>	<p>Reduce extent of new pipelines within culverts. Gradual reduction in existing old pipelines within culverts.</p>	<p>Cost and availability of resources.</p>
<p>4. Install debris screens and telemetry on culvert inlets, where appropriate.</p>	<p>Environment Agency, Local Authority, Riparian owners.</p>	<p>Reduced blockages within the culverts and improved maintenance response.</p>	<p>Capital costs.</p>
<p>5. Attenuate flows or provide alternative open water routes where culvert capacity causes flood risk.</p>	<p>Environment Agency, Local Authority, Riparian owner.</p>	<p>Reduction in flows entering culverted sections lessening flood risk.</p>	<p>Cost. Land take. Future maintenance.</p>
<p>6. Identify riparian owners and enforce compliance with their obligations.</p>	<p>Environment Agency, Riparian owners.</p>	<p>Reduce Environment Agency maintenance liability.</p>	<p>Initial costs in identifying owners and enforcement. Cost to riparian owners.</p>
<p>7. Do Nothing.</p>	<p>Environment Agency.</p>	<p>Reduced maintenance costs.</p>	<p>Increased culverting of watercourses with associated consequences of increased flood risk and loss of habitat quality.</p>

Issue 19 Poor Access to Watercourses For Maintenance Works¹

Background

There is poor access to watercourses at many locations within the area which restricts regular and emergency maintenance works. This problem is most apparent in urban and urban fringe areas where walls, fences and buildings have been built at the edge of the watercourses. This legacy is mainly due to past development, where the rivers became marginalised within the urban landscape.

Urbanisation has developed on the natural floodplain of the rivers and the natural river channels have been extensively modified by the introduction of walls, culverts, paved channels and weirs. Due to the natural river process of sediment transfer, and illegal tipping activities¹ in and adjacent to rivers, it is necessary to undertake cleansing and dredging works to maintain existing standards of flood protection to the adjacent properties.

Due to the difficulty in gaining access the costs of undertaking planned and emergency maintenance works can be disproportionately high. To offset this the current planned maintenance regime consists of infrequent visits during which extensive works are undertaken. As a result, extensive damage to the river habitat can occur and a reduction in the standard of flood protection during maintenance intervals will ensue. Significant ecological damage can also occur when plant and labour have to be moved along the river between existing access positions and the works location.

Maintenance costs and damage to the plant and animal habitats of the river caused by maintenance works would be significantly reduced by the provision of access points at the locations of these recurrent works.

The preferred means of performing maintenance operations is by working from the riverbank. Opportunities should be taken to enforce Land Drainage Byelaw No.7, requiring 8 metre wide access from the top of the bank or wall confining the river, when redevelopment is being considered.

Effects

- Reduced efficiency of maintenance operations within watercourses in urban areas.
- Limited access available to undertake emergency maintenance during flood situations.
- Irregular but extensive maintenance of watercourses undertaken to offset high costs generated by poor access.
- Poorly maintained stretches of watercourse reduce standards of flood protection.
- Needless damage to the plant and animal habitats within the river environment.
- Poor recreational access¹
- High cost of removal of tipped waste.

Examples

These problems are extensive throughout the area particularly where watercourses pass through the urban and urban fringe areas, but is most acute along the River Irwell within Salford, the River Croal in Bolton, the River Ogden and Riding Gate, Kirklees and Crow Tree Farm brooks.

It is proposed to construct access ramps at the River Ogden/Musbury Brook confluence and Salteye Brook adjacent to the M63 motorway during 1998/1999.

It is proposed to undertake a study to identify other possible locations to construct access ramps in the near future.

Options	Responsibility	Benefits	Concerns
1. Identify areas where improved access into the river channel would improve the efficiency and effectiveness of maintenance works and instigate a capital programme for their construction.	Environment Agency.	Reduced maintenance expenditure and improved effectiveness of maintenance activities. Improved access for recreational activities where appropriate, (This will support the aims of the Upper Irwell Strategy).	Initial Capital cost, Objections from riparian landowners. Security of waterside properties reduced. May increase risk of tipping and littering. Access structures can be visually obtrusive. Improved access may lead to a local deterioration of ecological value and loss of, or disturbance to the river corridor.
2. Purchase of specialised maintenance equipment to work in restricted areas.	Environment Agency.	increased efficiency of maintenance works.	Cost. Specialised equipment may not be fully utilised. No improvement to amenity value of the watercourse.
3. Do not provide improved access.		No additional cost.	No improvement to the amenity value or recreational use of watercourses. No improvement in public awareness of watercourses. No reduction in the damage to river habitats by maintenance works. Poor utilisation of maintenance resources.

Note¹ This issue cross references with Issue 22 'Adverse impacts of illegal waste disposal' and Issue 20' Lack of Awareness and Poor Access to Watercourses for Recreational Activities'.

Issue 20 Lack of Awareness and Poor Access to Watercourses For Recreational Activities¹.

Background

Rivers, still waters and other watercourses represent some of the few natural features found in heavily built up areas and are an excellent resource for outdoor recreation. Poor access to such features can restrict both informal and formal recreational activities including rowing, canoeing, walking, cycling, horse riding and angling. Watercourses within the Croal/Irwell area are mainly considered to be neglected and undervalued. People cannot walk along them and therefore do not perceive them to be an amenity or recreational asset.

When discussing the opportunities for the creation, extension and improvement of footpaths and increased access areas, consideration should be given to the possibility of disturbing wildlife and livestock, and the possibility of easier access for trespassers and flytippers.

Indicating the presence and overall value of a watercourse, through signage and interpretation material, should raise public awareness of the waterbody. This may help to discourage mis-use of the watercourse, raise the aesthetic appeal and generally improve public perception. Informal recreation should also be encouraged.

Better access for recreation can also improve access for flood defence maintenance thereby reducing the possibility of flooding.

Effects

Restricted recreation and amenity use, poor access and lack of potential for recreation along watercourses.

Unattractive and undervalued watercourses.

Lack of public awareness of the existence of watercourses

Examples

The problem of restricted access occurs in many locations throughout the LEAP area, including;

River Irwell -Downstream of Burrs Country Park -canoeing restricted by poor access (and vertical banks adjacent to the river)

River Croal -Downstream of Moses Gate Country park -canoeing restricted by poor access

River Irwell -within Salford and Manchester -canoeing restricted by poor access

Options	Responsibility	Benefits	Concerns
1. Identify where improvements for public access to watercourses are necessary for recreation, including water based recreation such as canoeing and rowing.	Environment Agency, Local Authority, Landowners, Groundwork Trusts, Upper Irwell Partnership, River Valley Initiatives, Ramblers Association, English Sports Council, Countryside Commission, Parish Councils, British Canoe Union, NW Rowing Council, Canal Societies.	Improved recreational use of the water environment. Allows public more access to enjoy rivers.	Land take. Maintenance. Security of waterside properties. May increase risk of tipping and littering. Access structures can be visually obtrusive.
2. Encourage the creation, extension and linking of linear parks, footpaths, cycleways and bridleways adjacent to waterbodies, including those in disrepair.	Environment Agency, Local Authority, Landowners, Groundwork Trusts, Upper Irwell Partnership, RVI, Ramblers Association, English Sports Council, Countryside Commission, Parish Councils, Canal Societies.	Improved recreational use and increased public perception of the watercourse.	Land take. Maintenance. Security of waterside properties.
3. Increase public awareness of the existence, nature conservation /recreational value and purpose of the watercourses, through signage and interpretation boards alongside footpaths and on bridge crossings.	Environment Agency, RVI, Local Authority, Schools, riparian owners and the local Groundwork Trusts, Countryside Commission, Upper Irwell Partnership.	Increased public knowledge, perception and awareness of the water environment and its uses.	Cost.
4. Do nothing		No immediate cost.	Poor utilisation of resources. Infrequent maintenance. Lack of public knowledge and awareness of watercourses.

Note¹ Linked with Issue 19 'Poor Access to Watercourses for Maintenance Works'.

Issue 21 The Adverse Environmental Impact Of Contaminated Land

Background

Redevelopment of land provides an opportunity to remediate contaminated sites and the Agency works closely with Local Authorities, developers, consultants and other organisations to ensure that where possible the environment is protected and improved by redevelopment. On some contaminated sites habitats have developed, which need careful consideration and protection as part of any proposed remediation work. However, whilst some sites can be addressed by redevelopment, this has not proved enough to make more than small inroads into the widespread problem. In some cases serious pollution is occurring and a more pro-active approach is required.

Section 57 of the Environment Act 1995 contains important new provisions on the regulation of contaminated land in England, Wales and Scotland. It inserts a new Part IIA into the Environmental Protection Act 1990 and places a duty on local authorities to inspect their areas for the purposes of identifying land which falls within a new statutory definition of contaminated land. Land formally designated as "contaminated land" is subject to a number of provisions intended to ensure unacceptable risks to health and environment are properly controlled. Both local authorities and the Environment Agency have an important role to play in achieving this objective.

The type and degree of harm to be taken into account, what is regarded as "significant" and how the remaining provisions of the legislation are to be discharged are to be set out in statutory guidance which is being prepared.

Effects

Contaminated land causes degradation of water quality in areas where direct discharges to surface waters are causing acute pollution.

Chronic pollution will also be occurring from more diffuse discharges, however these problems may not be identified where they are masked by other polluting input occurring elsewhere.

Contaminated land affects not only surface waters, but is also known to be affecting groundwaters at some sites.

Watercourses which should be an asset to the amenity of the area have a poor appearance, unpleasant odours, and provide an unhealthy environment with an impoverished ecology and loss of fishery potential.

Contaminated land hinders the Agency in its efforts to promote and improve the amenity and ecological value of this area and in the carrying out of maintenance and flood defence work.

Public health issues including landfill gas can cause problems such as damage to crops and vegetation. There are hazards such as asphyxiation and explosions in confined spaces. This has engineering and cost implication for developers.

Examples of contaminated land sites where the Agency has been involved

Victoria St Gasworks Bury (SD 794 109)

A full site investigation and risk assessment was carried out for British Gas Property Division by consultants Komex Clarke Bond in 1997 and remedial works agreed in principle with the Contaminated Land Section of the Agency. Remedial works were due to commence in 1998, but for commercial reasons these have been postponed by British Gas.

J & W Whewells Ltd., Bridge St Chemical Works, Radcliffe (SD 801 085)

After meetings with Environmental Protection And Contaminated Land Sections of the Agency, significant infrastructure improvements have been made in an attempt to reduce ongoing pollution of the R Irwell. A contamination investigation of the ground under the site is planned in the future.

Former Elf Oil Distribution Depot, Cadishead (SJ 712 919)

This site is known to be contaminated with hydrocarbons and is adjacent to the Manchester Ship Canal. In agreement with the Agency, Secor Consultants have installed a pump and treat scheme to remediate contaminated perched groundwater at the site. This required the serving of a conditional prohibition notice under section 86 of the Water Resources Act 1991 due to the recharge of treated water to the site via a soakaway. The potential impact of the residual soil contamination on the Manchester Ship Canal was modelled by Dames and Moore Consultants who concluded that there would be no significant impact.

Former Barton Rd. landfill site, Dimplington (SJ 760 970)

This is a formerly licensed landfill site which accepted mainly inert waste, but which was known to be producing landfill gas. The adjoining land to the north west lies adjacent to the Manchester Ship Canal and includes an infilled section of the former River Irwell channel. This was also producing landfill gas. A site investigation and risk assessment was carried out by Stanger Science Consultants for the Manchester Ship Canal Company. Site remedial works, mainly in the form of passive gas venting were agreed with the Agency prior to the construction of a sports centre.

Former Texaco/Carless site, Trafford park (SJ 776 977)

This is a site known to be contaminated with hydrocarbons and the Agency and former NRA have been trying to get the site remediated for a number of years. The site has been subject to several site investigations and a risk assessment has been carried out by Allott & Lomax Consultants for the previous site owners (the former Trafford Park Development Corporation). As a result, works to resolve the visual problem of oil pollution on the Manchester Ship Canal are under discussion with a number of interested parties. The design of a new oil interceptor which should solve this problem has been agreed with the Agency.

Sandywood former landfill, Lumns Lane, Salford (SD 794 023)

The Agency was consulted in June 1997 on a planning Application for housing. A full contaminated land and landfill gas investigation will be required prior to development and discussions regarding the nature of these have been carried out with Salford MBC. A limited site investigation of the site was previously carried out in 1991.

Singing Clough former landfill, Kersley (SD 744 050)

The Agency has provided detailed comments to Bolton MBC on the proposed investigation of this site for contamination and landfill gas prior to redevelopment for commercial use.

Watersmeeting, Tonge Valley, Bolton (SD 723 104)

This was an industrial site which was formerly used as a bleachworks with associated gasometer, reservoir and filter beds. The site is adjacent to Eagley and Astley Brook which join to the south of the site to form the River Tonge. Site investigations were carried out between 1994-6 by Parkman Consultants, and a remedial plan agreed with the Agency prior to commercial redevelopment of the site. This involved the removal of contaminated materials above agreed action levels, and limited lime stabilisation of areas unsuitable for construction for geotechnical reasons.

Union Way reclamation, Tonge Valley, Bolton (SD 733 076)

This site is a former industrial area which lies to the east of the River Tonge and was investigated between 1994-6 by Parkman Consultants. A remediation strategy was agreed with the former NRA and involved the removal of contaminated material above agreed action levels. This has been carried out in a number of phases prior to commercial redevelopment of the site.

Former Theodore Saint Just Chemical Works, Radcliffe (SD 797 067)

The Agency was consulted on plans by Bury MBC to remediate this site which is on the banks of the River Irwell. The remedial works were carried out in two phases and involved the removal of contaminated material, including corroded chemical drums to landfill. Sampling was carried out to prove the removal of contaminated material had been successful. A riverside footpath has now been installed by Bury MBC.

- former Red Moss landfill, Bolton
- former Bull Hill landfill, Bolton
- former Tower Farm landfill, Bury
- former Strong and Fisher landfill, Bury

Options	Responsibility	Benefits	Concerns
Identify and undertake detailed site investigation.	Site owners, developers, Local Authorities, Environment Agency.	Determine degree of contamination and identify suitable remediation approach.	Resources required to manage substantial information needs. Cost.
Develop a database of contaminated sites.	Environment Agency, Local Authorities.	Enable a more strategic and pro-active approach.	Resources required to manage substantial information needs. Cost.
Initiate and co-ordinate proposals for sites.	Landowner, Local Authorities, Environment Agency, English Nature, Greater Manchester Ecology Unit.	Improved co-ordination of action and communication of concerns.	Cost and public funding. Time.
Remediation of sites, where appropriate.	Landowner, polluter, developers, Local Authorities, Environment Agency, English Partnerships.	Improvements in environmental quality. Potential of the site for beneficial use may be greatly enhanced. Improved aesthetic appeal and recreational and amenity value.	Cost.
Encourage the development of brownfield sites for new housing.	Local Authorities, developers, Environment Agency.	Meet Government target of 60%. Retain greenfield sites and associated amenity value. Improve value of otherwise derelict land.	Restoration costs especially where contaminated.
Do nothing.		No immediate costs.	Possibility of groundwater and surface water pollution. Loss of amenity. Diversion of development to Greenfield sites.

**Croal/Irwell
Local Environment Agency Plan
Map 2**



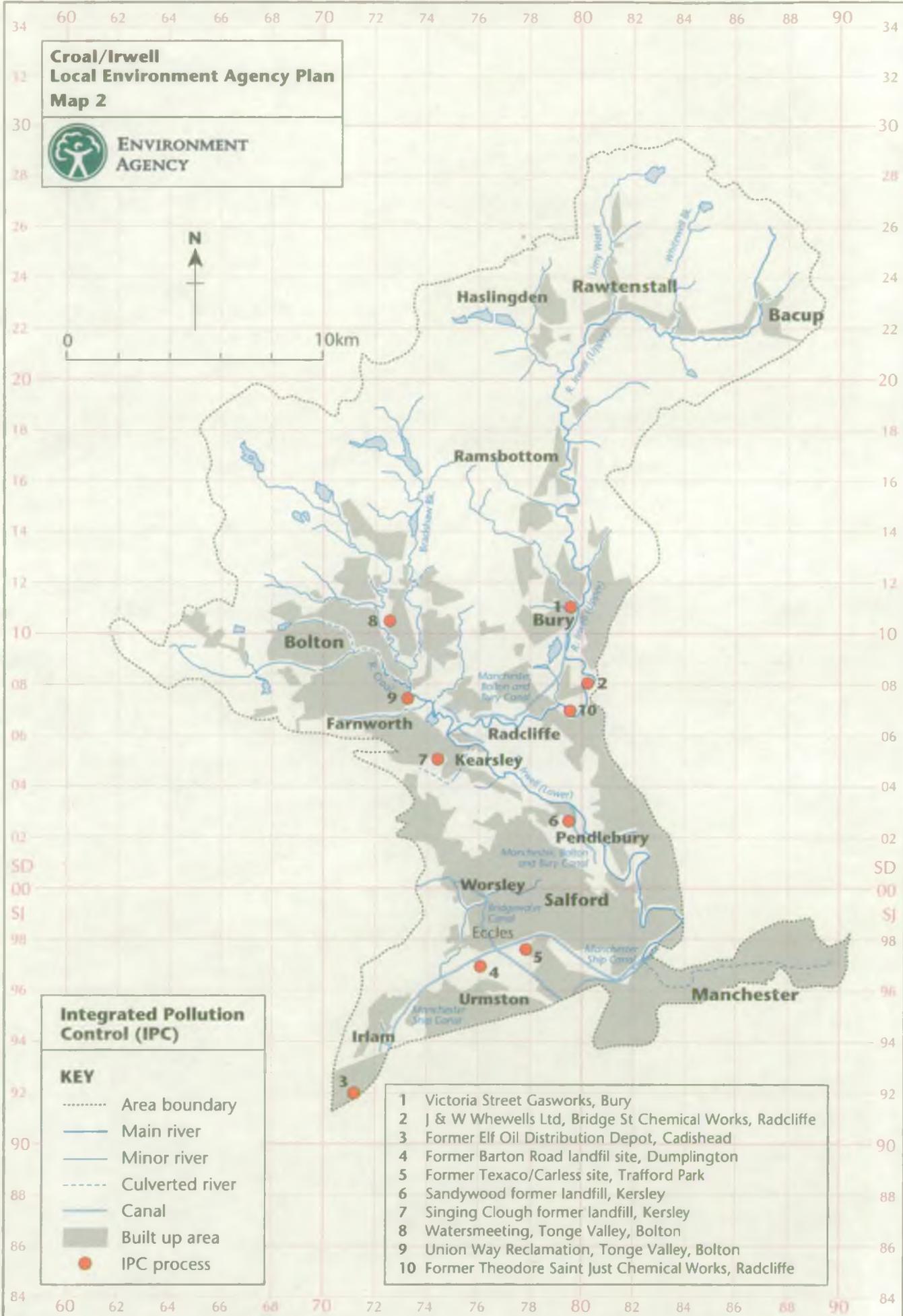
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Integrated Pollution Control (IPC)

KEY

- Area boundary
- Main river
- Minor river
- - - - - Culverted river
- Canal
- Built up area
- IPC process

- 1 Victoria Street Gasworks, Bury
- 2 J & W Whewells Ltd, Bridge St Chemical Works, Radcliffe
- 3 Former Elf Oil Distribution Depot, Cadishead
- 4 Former Barton Road landfill site, Dumpington
- 5 Former Texaco/Carless site, Trafford Park
- 6 Sandywood former landfill, Kersley
- 7 Singing Clough former landfill, Kersley
- 8 Watersmeeting, Tonge Valley, Bolton
- 9 Union Way Reclamation, Tonge Valley, Bolton
- 10 Former Theodore Saint Just Chemical Works, Radcliffe



Issue 22 Adverse impacts of illegal waste disposal

Background

There is a significant problem of illegal waste disposal activity, including "flytipping", in this area. This occurs particularly in urban areas, but can also be a problem in the more rural localities. Wastes are deposited on all kinds of open sites, including waste ground, derelict premises, car parks, verges, alleyways, public highways, and in or adjacent to rivers, lakes, ponds and canals.

The wastes concerned typically include building and demolition wastes, domestic refuse, garden and DIY wastes and unwanted furniture and domestic appliances. More problematic wastes are abandoned from time to time such as asbestos, chemical waste and tyres. The quantities involved range from single bin bags of household waste to bulk lorry loads of building wastes.

Waste tipped into watercourses quickly builds up and blocks the flow of water, especially where it becomes trapped within culverts or at bridges. This increases the likelihood of flooding to roads and property. It also causes aesthetic deterioration of the watercourse or canal and its surrounding area. The Agency supports the Water Watch and Stream Care projects working on waterside waste and litter problems. Water Watch identifies sources of waterside waste, advises on solid waste management and encourages involvement by Local Authorities, waterside businesses, schools, voluntary groups and local communities in clearing up and preventing problems recurring. An important part of the Projects's work is raising the awareness of the problems caused by the deposit of waste in rivers and canals. Stream Care supports local voluntary action to clean up and care for streams and rivers. Local communities, schools and groups can get help, advice and equipment to carry out a clean up. Groups can also be helped to improve the waterside environment.

The Agency's Enforcement Team helps to control illegal waste disposal activity, both by direct observation and inspection, and as a result of information received from members of the public, Local Authority officers and members of the waste disposal industry. The team undertakes to investigate all incidents made known to it, and where necessary will take action, ranging from education and persuasion to enforcement notices or ultimately prosecution.

Local Authorities also deal with a large number of flytipping incidents each year, including clearing up the waste in many cases, and investigating the incident. There are currently ambiguities in the respective roles of Local Authorities and the Environment Agency with regard to flytipping, and for this reason the Environment Agency is currently developing a flytipping strategy. The strategy will include a flytipping matrix which makes clear the responsibilities of local authorities and the Agency, depending on the type and severity of the incident.

In addition to flytipping incidents, there are also a number of waste management activities operating illegally without a waste management licence or exemption, including some scrap metal dealers and car breakers. These sites may pose a pollution threat to the environment.

Effects

- Detriment to local amenity
- Risk of environmental pollution
- Risk of physical injury and harm to human health
- High cost of cleaning up flytipping incidents
- Increased risk of flooding.
- Increased cost of river maintenance
- Adverse affect on public image of rivers

Examples

The nature of this problem means that it can occur throughout the LEAP area. It is however, more prevalent within built up areas.

Options	Responsibility	Benefits	Concerns
1. Prompt regular clearance of flytipped material, attempt to recover costs.	Local Authorities, landowners, Tidy Britain Group, Voluntary Groups.	Effects of flytipping reduced. Increased aesthetic and amenity value.	Cost. Unclear responsibilities
2. Agree flytipping strategy and matrix of responsibilities.	Environment Agency, Local Authorities.	Clearer responsibilities for dealing with flytipping. More effective management and investigation of incidents.	Obtaining agreement. Implementing strategy.
3. Improve awareness and information on best waste management practice and facilities.	Environment Agency, Local Authorities, Waste Disposal Authorities.	Encourage awareness and better practice. Reduce effects of flytipping.	Cost.
4. Promote the control of unauthorised access to problem sites.	Environment Agency, Local Authorities, Landowners.	Discourage use of particular sites.	Cost. Problem may be moved elsewhere.
5. Promote greater liaison between EA and Local Authorities.	Environment Agency, Local Authorities.	Pooling of knowledge to combat flytipping.	Cost. Organisation.
6. Educate the public about the adverse impacts of illegal waste disposal.	Environment Agency, Local Authorities.	Reduce flytipping incidents.	Cost and resources.
7. Identify all unauthorised metal recycling sites in the area and regulate through licensing or exemption.	Environment Agency.	Identify the extent of the problem and reduce threat of pollution.	Cost and resources. Difficulty in locating sites.

A "Do nothing" option is not applicable as one of the Environment Agency's core activities is to enforce illegal waste disposal.

Issue 23 Need To Increase the Awareness of Sustainable Waste Management

Background

In December 1995 the Government published "Making Waste Work - a strategy for sustainable waste management in England and Wales", indicating that waste management should be pushed as far up the following waste hierarchy as possible.

REDUCTION
+
RE - USE
+
RECOVERY
Recycling
Composting
Energy recovery
+
DISPOSAL

The consultation paper on the waste strategy for England and Wales titled "Less Waste, More Value", launched in June 1998, is an indication of on going Government pressure to move towards sustainable development.

The Agency will have a key role in delivering this strategy at a local level, including providing information and statistics, and forming partnerships with appropriate interest groups to encourage local waste minimisation and recycling projects.

Effects

Wasted resources such as raw materials, energy and water
Cost to industry of waste production and disposal
Loss of valuable materials for the reprocessing market
Large volumes of potentially recyclable household waste are deposited at landfill sites, therefore taking up valuable voidspace at landfill sites.

Examples

The nature of this problem means that it occurs mainly in urban areas throughout the LEAP area.

Options	Responsibility	Benefits	Concerns
Identify the potential for setting up waste minimisation clubs in the area.	Environment Agency, Business Links, Groundwork Trusts, Local Authorities.	Increased waste minimisation and recycling and reduction of waste to landfill. Reduced environmental impacts.	Unclear responsibilities. Cost.
Create working relationships with waste producers, waste collection and disposal authorities and reprocessors - promote the environmental and economic benefits of sustainable waste management.	Environment Agency, Groundwork Trusts, Business Links, Local Authorities.	Increased awareness of waste minimisation.	Diversity of external groupings, cost.
Do nothing.		Cost saving.	Landfill space used up faster, requiring more sites to open, resources wasted, increased disposal costs, lack of sustainable waste management.

Issue 24 Adverse Impact of Discharges from Wastewater Treatment Works, (WwTW)

Background

The main Wastewater Treatment Works (WwTW) in this area are Rossendale, Bury, Bolton, Davyhulme, Salford and Eccles. The works are all consented, however, the consents do not provide full environmental protection. In dry weather, the discharges from some works can be a substantial part of the river flow. The impacts on the watercourses that the works discharge to is significant. In many cases the impact results in the failure of the river to meet designated River Ecosystem/River Quality Objectives thereby reducing the level of protection afforded to aquatic life.

Wastewater Treatment Works can have additional effects on a river. Some works cause visual problems including discolouration of the water and foaming.

Considerable investment has been made by NWW Ltd. to build new, and improve existing WwTW over the last few years and further improvements are programmed for the future. The programme of expenditure by Water Service Companies such as NWW Ltd. on environmental improvements is known as the Asset Management Plan (AMP). The amount of capital that is made available is determined in negotiations with OFWAT. The second such plan AMP2, covers the period 1995 to 2000. The third plan AMP3 covers the period April 2000 to March 2005.

Effects on watercourse

- Increased biochemical oxygen demand and ammonia levels.
- Reduction in dissolved oxygen.
- Reduction, or in extreme cases the elimination, of aquatic fauna and flora.
- Surface films of oil and grease reducing oxygen exchange between air and water.
- Sewage litter debris and waste materials in the watercourse.
- Growths of sewage fungus.
- Discolouration of the water.
- Unpleasant odours.

Examples

Bury WwTW discharges to the Irwell near Blackford Bridge. The works has an impact on the downstream stretch of the Irwell which fails the River Quality Objective, and a problem with foam. The Environment Agency is concerned that the discharge may be causing the river to become eutrophic. There are intermittent aesthetic problems with foam.

Bolton WwTW has a significant impact on the Lower Irwell. The Environment Agency perceive that the effluent from the works may be causing eutrophication. The discharge contributes to the failure of the River Quality Objective and a problem with foam.

Eccles WwTW discharges to Saltey Brook, a tributary of the Manchester Ship Canal. The watercourse significantly fails the long term River Quality Objective.

The Manchester Ship Canal receives the discharge from a number of WwTW including Salford, Davyhulme and Urmston. Of these, Davyhulme has an impact on the Manchester Ship Canal in terms of organic load, intermittent colour and foam. Improved treatment facilities are being built at this moment.

Belmont WwTW discharges to Eagley Brook. This works takes trade effluent that results in an intermittent coloured discharge and has an organic impact downstream.

Rossendale WwTW discharges to the River Irwell. There are aesthetic problems with intermittently discoloured discharges. There is an impact on the Irwell downstream from the pesticide Permethrin, which the works takes in as a trade effluent. Discussions between the Environment Agency, Kearns and NWW have sought reductions in the levels of Permethrin in the effluent to achieve the required environmental quality standards.

Options	Responsibility	Benefits	Concerns
1. Reduce the organic load from WwTW to achieve and ensure compliance with short term RQOs.	Environment Agency NWW Ltd.	Improvement of the aquatic ecosystem.	
2. Assess the impact of WwTW discharges on rivers failing RQOs for future improvements and possible expenditure required in NWW Ltd Capital Programme (AMP3).	Environment Agency.	Achievement of RQOs and improvement of the aquatic environment.	Cost to Customers of NWW.
3. Monitor for possible eutrophication to determine if a reduction in the nutrient content of effluent discharges is needed.	NWW Ltd, Environment Agency.	Prevent algal blooms and the eutrophication of water bodies. Achieve Directive standards. Improve fishery potential.	
4. Pursue better control of trade effluents received at WwTW.	NWW Ltd.	Reduce impact of foaming and colour, and control toxic substances.	Cost to Industry.
5. Raise public awareness concerning chemicals used in the home.	Environment Agency, Manufacturers.	Reduce the impact of chemical substances on the environment.	Cost.
6. Once completed monitor and assess the impact on the watercourses following improvements at the WwTW.	Environment Agency.	Determine if the objectives have been achieved. Provide data for future decision making.	
7. Do Nothing.			Deterioration in water quality. Failure to meet objectives.

Issue 25 Adverse Impact of Industrial Discharges on Water Quality

Background

European Union Directives, the Environmental Protection Act (1990) and the Environment Act (1995) control the release of certain substances that are go into the environment. Any industry directly discharging to a watercourse has to have a Consent to Discharge. Certain industrial processes produce waste that can have a harmful effect to the environment, these are subject to Integrated Pollution Control (IPC) Authorisations. Both Authorisations and Consents set limits on the release of substances that can pollute the environment.

The Environment Agency recognises that there is a risk to the environment from the release of complex mixtures of substances that when combined could potentially be toxic in water. The Environment Agency, in order to provide better protection through regulatory control are undertaking trials using toxicity assessment on discharges to watercourses. This can be used to assess the impact of a discharge and possibly, in the future, toxicity based consent conditions be introduced on certain discharges.

Effects on watercourse

- Increased biochemical oxygen demand and ammonia levels.
- Reduction in dissolved oxygen.
- Reduction, or in extreme cases the elimination, of aquatic fauna and flora.
- Surface films of oil and grease reducing oxygen exchange between air and water.
- Accumulation of litter, debris and waste materials.
- Discolouration of the water.
- Unpleasant odours.

Examples

There are few direct trade discharges to water in this LEAP. The majority of industrial and trade effluent goes to the NWW WwTW. The major remaining dischargers are:-

Magnesium Electron (IPC) discharge to Slack Brook, the ammonia content of the effluent contributes to the failure of the brook achieving the River Quality Objective. It also has an effect on the River Irwell downstream of the brook.

Robert Fletchers Paper Mill discharge to the Irwell has a high organic load which has an impact on water quality.

Pilkington Tiles discharge to the Irwell contains fine suspended solids. A programme has been implemented to improve the discharge.

Chloride Industrial Batteries (IPC) discharge to the Irwell contains listed metals.

Marshalls Mono Ltd. in Ramsbottom discharges Quarry drainage to the Irwell.

Barden Roadstone Jamestone Quarry at Haslingden discharge to the Irwell.

Options	Responsibility	Benefits	Concerns
1. Improve on site treatment of effluent discharges or if possible divert to sewer.	Industry, NWW Ltd, Environment Agency.	Reduce pollution and improve water quality and aquatic ecosystem. Improve aesthetic, amenity value and fishery potential.	Cost to industry. The availability of a nearby sewer and suitable treatment works.
2. Hold discussions with Industry, to review Authorisations and Consents to bring them in line with new regulations and to meet environmental objectives.	Environment Agency, Industry.	Reduce pollution and improve water quality and aquatic ecosystem. Improve aesthetic, amenity value and fishery potential.	Cost to Industry.
3. Promote prompt on site response to works malfunction and accidents.	Environment Agency, Industry.	Minimise the risk of environmental pollution.	Cost to Company.
4. Minimise waste from industry and where possible promote reuse and recycling.	Environment Agency, Industry.	Savings in cost to companies and natural resources.	Possible cost due to re-structuring or new equipment.
5. Do Nothing.			Deterioration in water quality. Failure to meet objectives.



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Protection Through Partnership

This section provides information on joint initiatives and partnership between the Agency and others.

The Department of the Environment's Statutory Guidance under Section 4 of the Environment Act 1995 (draft June 1996) describes how the Agency should contribute towards the objective of attaining sustainable development. In particular it concludes that the Agency should:

- make use of integrated catchment management planning or other integrated geographical management tools in order to take a holistic approach to the protection and enhancement of the environment
- strive to develop close and responsive relationships with the public, local authorities and other representatives of local communities, regulated organisations and public bodies with environmental responsibilities. It should also strive to work in partnership with all such groups.

The protection of the environment on a local and global scale requires partnership and cooperation, if we are to be successful in achieving sustainable development as described by the World Commission on Environment and Development, in the Brundtland Report. To this end the Environment Agency is involved in many partnerships and funds many projects.

Local Agenda 21 in the Croal/Irwell LEAP area

This LEAP area contains some of the foremost Local Authorities in the region for their development of local agenda 21 with their communities. Bolton, Bury and Manchester have all produced plans for their areas. The Agency has worked with Bolton and Bury's environment fora, giving advice and consulting local people on the issues in this document. The Agency has also been working closely with Salford C.C. in connection with the regeneration of the Manchester Ship Canal and we are represented on local community groups there. Rossendale LA21 is being helped by the local Groundwork office and the Agency has had links with it through local River Valley Initiatives. The most recent development has been with Blackburn and Darwen LA21 team. They are piloting Action at Home (a programme for more sustainable lifestyles) with a residents association in Ewood Park which is sponsored by the Environment Agency.

North-West Regional Biodiversity Audit

This audit began in November 1996 and aims to produce a strategic overview of the region's habitats and species of conservation concern. The Regional Biodiversity Steering Group consists of English Nature, County Ecologists, Biological Records Centres, Wildlife Trusts, RSPB and the Environment Agency. The main outcomes to date are a set of regional Species Statements for all national key species. Matrices which show distributions of species of local and national importance are almost complete. Habitats have been classified into 82 sites which occur in the North-West. Habitat statements have been produced for all these types, together with distribution matrices for political boundaries and Natural Areas.

The Audit is due to be launched in January 1999.

Mersey Basin Campaign

The Mersey Basin Campaign is the 25 year, government backed partnership, which brings together local authorities, businesses, voluntary organisations, and government sponsored agencies, to deliver water quality improvements and waterside regeneration throughout the Mersey Basin river system. The aims of the Campaign are;

- to improve water quality so that all rivers, streams and canals are clean enough to support fish
- to stimulate the development of attractive waterside environments - for businesses, housing, tourism, heritage, recreation and wildlife
- to encourage people to value and cherish their watercourses and waterfront environments.

Water Watch

Water Watch is a project to reduce the amount of litter and debris in and around the rivers and canals of the Mersey Basin area. It does this by raising public awareness, appraising and giving specific advice on urban debris problems and developing partnerships with local authorities, businesses and local communities, to tackle problems in the area's rivers and canals. Water Watch is a partnership between the Mersey Basin Campaign, the Environment Agency and the Tidy Britain Group who manage the project.

Within the LEAP area, Water Watch has:

- given training to the Darwen River Valley Initiative (RVI) co-ordinator on the project's waterside litter survey techniques and has taken part in a number of awareness raising events including voluntary clean-ups. Current involvement includes helping the initiative develop a Tidy Waterside Business Charter which will encourage waterside businesses to manage their solid waste more effectively and so protect local waterways.
- produced a report (1996) for the Radcliffe Renewal Group on how to tackle the rubbish problems associated with sections of the River Irwell and Manchester Bolton and Bury Canal in Radcliffe.
- commissioned, together with the Environment Agency, a student study on the sources and pathways of litter and debris in the Lower Irwell, particularly studying linkages with the types of debris deposited at Mode Wheel Locks on the Manchester Ship Canal. Water Watch is, with the MBC and partners, involved further in looking for ways to reduce the amount of litter and debris at Salford Quays.

Mersey Basin Trust

The Mersey Basin Trust is the voluntary sector arm of the Mersey Basin Campaign. The Trust is a network made up of organisations representing the community and voluntary sectors. The Trust runs a number of projects which provide voluntary groups and schools with information, advice and financial assistance to help them carry out projects which support the aims of the Mersey Basin Campaign. For example:

Water Detectives

The Mersey Basin Trust Water Detectives project helps schools to carry out national curriculum work on the topic of "Rivers" through conducting stream surveys and providing teaching materials such as education packs and aerial photographs. Shell UK is the main sponsor of Water Detectives.

Stream Care

Stream Care and the Mersey Basin Trust community project officer help voluntary and community groups to "adopt" a local watercourse. The Trust is able to provide advice and support which enable member groups to carry out small scale practical projects. Stream Care is funded by North West Water Ltd and the Environment Agency.

Examples of projects supported by Stream Care in the Upper Irwell area include:

- Stream Care assisted Groundwork Rossendale and Duke of Edinburgh volunteers from Bacup to enhance the River Irwell in the Cloughfield area during October 1997. The Trust community project officer advised on the health and safety aspects of clearing litter from the river. Stream Care was able to provide equipment, such as gloves, rope and waders, for the volunteers and provided funds to hire a skip. The second part of the project involved planting bulbs along the banks of the river. The planting was organised and designed by Groundwork. Stream care was again able to provide funds.
- The Chesham Fold Tenant Management Organisation of Bury has been active in looking after their local stream, the Gypsy Brook, for the past couple of years. The group has initiated a number of clean-ups and cleared excess vegetation from in and around the stream. The Trust has helped the group to build links with the local British Trust for Conservation Volunteers (BTCV) office and Stream Care has provided funding for items such as protective equipment and skip hire.

The Upper Irwell Partnership

The Upper Irwell Partnership comprising of six core members, the Environment Agency, Lancashire County Council, Mersey Basin Campaign, North West Water Limited, Rossendale Borough Council and Rossendale Groundwork Trust, has highlighted the need for a Regeneration Strategy and Action Plan for the Upper Irwell catchment area. It will address the problems of the area in relation to the physical, social and economic environment which have been affected by the decline in certain industries, development and associated factors. The mission of the partnership is to regenerate the Upper Irwell Valley corridor in Rossendale and secure a long term sustainable future for the river and its surrounding environment.

Steam, Coal and Canal

The Steam, Coal and Canal project will create Great Britain's first Linear Industrial Heritage Park. The Park will run along the Bridgewater Canal Corridor, initially from Barton Aqueduct to Leigh Basin and, eventually be extended all the way from Castlefield to Wigan Pier. Steam Coal and Canal will use the canal and its towpaths to link together important sites in our industrial heritage.

Steam, Coal and Canal is a partnership between the Local Authorities through which the Bridgewater canal passes, the Environment Agency, the Countryside Commission and the Red Rose Forest, together with voluntary associations such as the Inlands waterways Association and the Worsley Civic Trust and partners from the private sector who include the Manchester Ship Canal Company, Terry Adams Ltd and Bridgewater Boatbuilders.

Lower Irwell Valley Integrated Action (LIVIA)

The LIVIA project is a partnership between the Groundwork Trust, Salford City Council and the Agency and aims to secure environmental improvements in the Agecroft and Salford areas. Clifton Valley is an example of an area of degraded, old industrial landscape where the Agency is supporting the work of the LIVIA project. This involves the landscaping of open sections of Slack Brook.

Clean-up of Salford Docks

The Agency is working with North West Water Limited, Salford City Council, Trafford Metropolitan Borough Council and the Manchester Ship Canal Company on a project to improve water quality in the Salford Quays area through re-oxygenation techniques.

The East Lancashire Waste Minimisation Club (ELiminate)
The ELiminate project has recruited 18 companies to date who have begun work on waste, water and energy problems. The project was initiated by Groundwork Blackburn's Business Environment Association, Northern Technologies and the East Lancashire Business Environment Network (ELBEN). The Environment Agency is on the projects steering group.

Land Use Planning

The Environment Agency is taking a pro-active role in the land-use planning system. We published our national document Liaison with Local Planning Authorities (LPAs) March 1997. The document explains our role and contribution to the land use planning system.

Past development has had a major influence on shaping the area and the planning system plays an important role in protecting much of its special character. New development has to be carefully considered to recognise both potential adverse effects, as well as the benefits, change can have on the environment. We consider LEAPs are an important part of the on-going dialogue with LPAs to foster partnerships and identify issues, where environmental problems and potentials can be most actively pursued.

The link between Development Plans and LEAPS is most important. Section 54a of the Town and Country Planning Act 1990 indicates that decisions on development proposals should be made in accordance with development plans unless material considerations indicate otherwise. The recognition of LEAPS in development plan process is considered essential, as certain LEAP issues, could have an impact on future land use planning.

Local Biodiversity Action Plans (LBAPs) are also to be put in place to monitor and improve biodiversity on a local scale. At present these are mainly in the planning stage, but the Agency expects to have a considerable input to these plans.

Regional and Area Committees

Each region of the Agency has three statutory Committees, which we support, and which play a vital role in our relations with those affected by our work. These committees meet four times a year and the meetings are open to the public and press. The committees are;

Regional Environment Protection Advisory Committee

We are required to consult this Committee about proposals relating to the way in which we carry out our functions in the Region and we must consider representations made by the Committee. The chief role of the Committee is to identify issues of special importance to the Region, to act as a regional sounding board for ideas emanating from the Agency and our Policy Directorates and to help the Regional Managers to do their jobs by providing advice on matters arising in the Region. The Committee's general remit covers all aspects of the Agency's functions but it would not normally expect to concern itself with specific matters dealt with by the other committees.

Regional Flood Defence Committee

The chief role of this Committee is to advise us on the manner in which we discharge our duties in relation to Flood Defence in the Region.

Regional Fisheries Advisory Committee

The chief role of this Committee is to advise us on the manner in which we discharge our duties in relation to Fisheries and Recreation in the Regions and these duties will also include advising on all Conservation issues relating to the functions within its remit.

The South Area of North West Region also has three other committees or groups, which are;

Area Flood Defence Advisory Committee

The role of this Committee is to be receptive to local opinion on flood defence and land drainage issues. Also, to consider new flood defence capital schemes, proposed variations to the statutory Main River Map and other matters of a local nature and to make recommendations to the Regional Flood Defence Committee.

Area Environment Group

This group provides a communication link between the local community and the Agency, advice to the Area Manager on the local environment and a focus for the input into Local Environment Agency Plans (LEAPs)

Liaison Groups

This group has been set up due to the large number of Local Authorities and Councils, within the South Area, who could not be fully represented on the Area Environment Group. It provides a link between the Agency and these Authorities on a local level..

Other Partnerships

Bolton Environment Forum,
Bolton "Living Links"
Business and Ecology Demonstration Project
English Nature,
Environet 2000,
Farming and Wildlife Advisory Group,
Greater Manchester Ecology Unit,
Greater Manchester Archeology Unit,
Irwell Sculpture Trail,
Pond "Life" Project,
Rossendale Borough Council, Highways Department,
Rossendale Quarries Project,
The Manchester, Bolton and Bury Canal Society,



Appendices

ABSTRACTION

Removal of water from surface of groundwater.

ABSTRACTION LICENCE

A licence to abstract water issued by the Environment Agency. The maximum annual, daily, and hourly abstraction rates are normally set within the terms of the licence.

AGENDA 21

A comprehensive programme of worldwide action to achieve more sustainable development for the next century. UK Government adopted the declaration at the United Nations Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro in 1992.

ALLUVIAL

Referring to materials eroded, transported and deposited by the action of river flow.

AQUIFER

A layer of underground porous rock which contains water and allows water to flow through it.

ASSET MANAGEMENT PLAN 2 (AMP2)

The second Asset Management Plan produced by the Water Companies for the Office of Water Services (OFWAT). It sets out the water industry investment programme for the period 1995 to April 2000.

ASSET MANAGEMENT PLAN 3 (AMP3)

The third Asset Management Plan produced by the Water Companies for the Office of Water Services (OFWAT). It sets out the water industry investment programme for the period April 2000 to March 2005 and will follow on from AMP2.

BED

The bottom of a river.

BERM

A shelf at the base of a bank at normal flows which gives extra channel width in high flows.

BED CONTROL

Stable river bed which limits the movement of bed materials.

BEST PRACTICABLE ENVIRONMENTAL OPTION (BPEO)

Can be applied to any aspect of pollution control used to indicate the waste disposal choice having the least impact on the environment. It does not refer to cost; the BPEO may be the most expensive.

BIOCHEMICAL OXYGEN DEMAND (BOD)

A standard test which measures over 5 days the amount of oxygen taken up by aerobic bacteria to oxidise some organic (and some inorganic) matter.

BIOLOGICAL HERITAGE SITE (BHS)

Sites that have been designated by Local Authorities in Lancashire, for their nature conservation value.

BUFFER STRIP

Strip of land alongside watercourses which is removed from intensive agricultural use or left free from development of any kind.

CHANNEL

A cutting in land along which a river flows.

CIVIC AMENITY SITE

Facility provided by a local authority for householders to take bulky household waste, garden wastes and other household wastes which are not normally taken by vehicles on domestic waste collection rounds.

CLOUGH

A small steep sided river valley.

COARSE FISH

This is a common term for Cyprinid fish and other commonly associated species such as pike, perch and eels. The term does not normally refer to minor species such as bullhead, stone loach, minnow and stickleback.

COMBINED SEWER OVERFLOW (CSO)

An overflow structure which permits a discharge from the sewerage system during wet weather.

COMPENSATION WATER

Water released from a reservoir to maintain the flow required in the river.

CONFLUENCE

Point where two, or more, rivers meet.

CONTROLLED WASTE

Defined by the Control of Pollution Act 1974, Part 1 Section 30. It includes household, industrial and commercial waste.

CONTROLLED WATERS

Defined by the Water Resources Act 1991 Part III Section 104. They include groundwaters and inland waters, estuaries and coastal waters to three nautical miles from the shore.

CULVERT

A man-made structure, for example a pipe, carrying a watercourse underground.

CYPRINIDS

The carp family of fish comprising some 200 freshwater species.

DEPOSITION

Where a river flows more slowly it may deposit gravel, sand and silt in its channel - often on the inside edge of bends or meanders.

DETRITIVORE

An invertebrate that feeds on decaying organic matter such as leaves.

DIFFERENT UNITS FOR FLOW MEASUREMENT

m ³ /s	Cubic metres per second (cumec)
l/s	Litres per second
Ml/d	Megalitres per day
mgd	Millions of gallons per day

Conversion Table

m ³ /s	Mld	mgd
0.012	1	0.224
0.06	5	1.12
0.12	10	2.24
0.24	20	4.48
0.6	50	11.2
1.2	100	22.4

DIFFUSE POLLUTION

Pollution without a single point source, eg pesticides, urban runoff.

DRIFT

Superficial deposits covering solid rock. Often deposited by rivers or by former glaciation in the form of boulder clay, peat or sands and gravels.

DRY WEATHER FLOW

It is a selected flow that is not exceeded for ten successive days which is also referred to as a Q95 flow.

ECOSYSTEM

A functioning, interacting system composed of one or more living organisms and their environment, in a biological, chemical and physical sense.

EUTROPHICATION

Enrichment of water by nutrients causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned.

FAUNA

Animal life.

FLOODPLAIN

Parts of river valleys which are inundated during floods. It includes areas protected by flood defences.

FLYTIPPING

The illegal dumping of waste.

FRESHWATER FISH

For the purpose of the Salmon and Freshwater Fisheries Act 1975, fish other than salmon, brown trout, sea trout, rainbow trout and char.

GEOMORPHOLOGICAL FEATURES

Physical features of a river, which include meandering (winding) channel, gravel beds and shoals, oxbows, earth cliffs and river terraces.

GROUNDWATER

Water contained in the void spaces of pervious rocks and also within the soil.

INDIGENOUS

Occurring naturally in a particular area.

INTEGRATED POLLUTION CONTROL(IPC)

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.

INVERTEBRATE

Animal without a backbone for example insects.

LANDFILL

The deposit of waste into or onto land, which can then be restored to some other use. The predominant method for the disposal of controlled waste in the UK.

LEACHATE

Liquid containing material in solution, draining from the ground.

LOAD

A measure of the material carried by a river either in suspension or as dissolved material.

LOCAL PLANS

Statutory documents produced by District or Borough Councils to implement the development strategy set out in County Structure Plans. Specific land use allocations are identified.

MAIN RIVER

Some, but not all, watercourses are designated as Main River. Main River status of a watercourse must first be approved by MAFF. The Environment Agency has the power to carry out works to improve drainage or protect land and property against flooding on watercourses designated as Main River. Formal consent is required for all activities that interfere with the bed or banks of the river or obstruct the flow.

MARGINAL

At the water's edge.

NUTRIENTS

Providing or contributing nourishment.

OCHRE

Iron based orange discolouration.

OUTFALL

The point where a river or pipe discharges.

PART A PROCESSES

Complex industrial processes with the potential to cause pollution, regulated through Integrated Pollution Control by the Environment Agency.

PART B PROCESSES

Less complex processes where emissions to air are regulated by Local Authorities.

PERMISSIVE POWERS

Powers which confer the right to do things but not the duty.

POOL

A deep slowing flowing section of a river or stream.

POTABLE WATER

Water fit for human consumption.

PRECIPITATION

The total amount of water which falls as rain, hail, or snow expressed as mm or inches of rainfall over a specified period.

RESIDUAL FLOW

The flow remaining in a watercourse after abstractions have taken place.

RETURN PERIOD

Refers to the return period of a flood. Flood events are described in terms of the frequency at which, on average, a certain severity of a flood is exceeded. This frequency is usually expressed as a return period in years, e.g. 1 in 50 years.

RIFFLE

A shallow, but fast flowing part of a river or stream.

RIPARIAN

Of, or on, the banks of a river.

RIPARIAN OWNER

Owner of land abutting a river or lake. Normally riparian owners own the bed of river to the mid point of the channel.

RIVER CORRIDOR

Stretch of river including its banks and the land close by.

RIVER QUALITY OBJECTIVE(RQO)

The level of water quality that a river should achieve in order to be suitable for its agreed uses.

RUN-OFF

Water leaving a river catchment. Normally regarded as rainfall minus evapotranspiration (evaporation and loss of water by plants) but commonly used to mean rainwater flowing across the land.

SALMONIDS

Fish classified as belonging to the Salmon family, such as Salmon, Trout and Char.

SITE OF BIOLOGICAL IMPORTANCE (SBI)

Sites which have been designated by Local Authorities, sometimes in conjunction with local Wildlife Trusts, for their nature conservation value.

SHOAL

A sand and/or gravel deposit at the edge of or within river channel.

SITE OF SPECIAL SCIENTIFIC INTEREST(SSSI)

Sites of national importance designated under the Wildlife and Countryside Act 1981 by English Nature in England. Sites may be designated to protect wildlife, geology or land forms.

SOURCE CONTROL

A collective term used to describe the management of run-off at or near the point of impact of rainfall and before it reaches the piped drainage and sewerage systems of urban areas. It can include the use of balancing ponds, permeable pavements and buffer strips.

SPATE

Very high flows, usually associated with rain storms and often cause flooding. Spate flows naturally cleanse the river channel.

SPECIAL WASTE

A strictly defined group of wastes, which are considered to be particularly dangerous or difficult, usually by virtue of hazard or toxicity and are therefore subject to additional controls.

STRATA

Layer of rock.

STRUCTURE PLANS

Statutory documents produced by County Councils outlining their strategy for development over a 10-15 year timescale.

SUSTAINABLE DEVELOPMENT

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

TRANSFER STATION (Waste Disposal)

A licensed depot where controlled waste is stored and sorted for disposal or recycling.

WATER TABLE

The surface of a body of groundwater within the underground strata. The water table will fluctuate as a result of natural or artificial causes.

AMP	-	Asset Management Plan
APES	-	Alkyl Phenol Ethoxylates
AOD	-	Above Ordnance Datum
BATNEEC	-	Best Available Techniques Not Entailing Excessive Cost
BC	-	Borough Council
BHS	-	Biological Heritage Site
BOD	-	Biochemical Oxygen Demand
BPEO	-	Best Practicable Environmental Option
BW	-	British Waterways
CC	-	City Council
CSO	-	Combined Sewer Overflow
DETR	-	Department of the Environment, Transport and the Regions
EC	-	European Community
EN	-	English Nature
EQS	-	Environmental Quality Standard
FRCA	-	Farming and Rural Conservation Agency
FWAG	-	Farming and Wildlife Advisory Group
GPZ	-	Groundwater Protection Zone
GQA	-	General Quality Assessment
HMIP	-	Her Majesty's Inspectorate of Pollution
HMSO	-	Her Majesty's Stationery Office
ICI	-	Imperial Chemical Industry
IPC	-	Integrated Pollution Control
LBAP	-	Local Biodiversity Action Plan
LPA	-	Local Planning Authority
MAFF	-	Ministry of Agriculture Fisheries and Food
MBC	-	Metropolitan Borough Council/Mersey Basin Campaign
MBT	-	Mersey Basin Trust

MCC	-	Manchester City Council
MSCC	-	Manchester Ship Canal Company
NFU	-	National Farmer's Union
NGR	-	National Grid Reference
NWW Ltd	-	North West Water Limited
QSL	-	Quality Survey Limit
RE	-	River Ecosystem
RHS	-	River Habitat Survey
RPG	-	Regional Planning Guidance
RQO	-	River Quality Objective
RSPB	-	Royal Society for the Protection of Birds
RVI	-	River Valley Initiative
SBI	-	Site of Biological Importance
SMD	-	Soil Moisture Deficit
SPA	-	Special Protection Areas
SSSI	-	Site of Special Scientific Interest
SWQO	-	Statutory Water Quality Objectives
UDP	-	Unitary Development Plan
UPM	-	Urban Pollution Management (procedures)
VOC	-	Volatile Organic Compounds
WCA 1981	-	The Wildlife and Countryside Act, 1981
WLMP	-	Water Level Management Plan
WML	-	Waste Management Licence
WRA	-	Water Resources Act
WwTW	-	Waste water Treatment Works

River Quality Objectives

River Ecosystem (RE) River Quality Objectives (RQO's) for the rivers and canals of this catchment are proposed here. These will initially form non-statutory Water Quality Objectives until notice is served by the Secretary of State for the Environment giving them legal status. Although a formal public consultation will take place before the objectives become statutory, views on the proposals are sought at this stage.

The stretches of river and canal to which the objectives have been applied are the same as those previously used for the National Water Council (NWC) system of classification and objectives.

It is also possible to relate the classes of the previous NWC objectives to the RE scheme. This has been considered in the assessment of the proposed RE objectives in addition to what the water quality is currently like and how this is predicted to change. Changes in water quality could arise, for example, as a result of improvements in consented discharges, improvements to farm drainage or changes in land use. Other assumptions have also been made such as, unless improvements are known to be in hand, consented discharges contain the maximum permitted pollutant load.

Objectives proposed for non-statutory RQO's and ultimately statutory WQO's will be achievable within 10 years or by a given target date. The dates given for compliance will become part of the statutory obligation. In predicting improvements it has only been possible to consider expenditure which is firmly committed. The recent negotiations relating to water company expenditure are of particular significance here.

For the purpose of this plan longer term RE RQO's have also been considered. Achievement of the proposed long term RQO's for some stretches may be beyond the timescale of this plan or require expenditure not available within this period. No date has been ascribed to these.

Statistical procedures have been used to assess whether samples collected for a particular river length are within the appropriate chemical standards. Failures have been distinguished as either marginal or significant.

The table below, summarises the proposed current and long term RE RQO's for the classified stretches of the LEAP area.

River Ecosystem (RE) River Quality Objectives (RQOs) for the River Irwell and River Croal.

River	Stretch	Length (km)	Short Term RQO	Long Term RQO
MANCHESTER SHIP CANAL	SALFORD DOCKS TO MERSEY	10	No Objective	RE4
IRWELL (MSC)	SALFORD UNIVERSITY TO SALFORD DOCKS	8.2	RE5 1997	RE4
IRWELL	ROCH TO SALFORD UNIVERSITY	22.3	RE5 1997	RE3
IRWELL	CHEST WHEEL BRIDGE TO ROCH	10.3	RE3 1997	RE3
IRWELL	ROSSENDALE STW TO CHEST WHEEL BRDG	9.2	RE3 1997	RE3
IRWELL	WHITWELL BK TO ROSSENDALE STW	6.4	RE2 1997	RE2
IRWELL	QSL AT DEERPLAY TO WHITWELL BK	8.7	RE2 M 1997	RE2
SALTEYE BROOK	ECCLES STW TO MSC	1	RE5 2006	RE4
WORSLEY BK	QSL AT FOLLY BK TO ECCLES STW	2.3	RE42001	RE3
FOLLY BK	QSL AT SWINTON STW TO WORSLEY BK	2.1	RE41997	RE3
CORN BROOK	OPENSHAW TO MSC	5.6	No Objective	RE4
SINGLETON BROOK	A56 TO RIVER IRWELL	1.5	RE5 2001	RE4
SLACK BROOK	LUMN'S LANE TO IRWELL	0.6	No Objective	RE4
UNITY BROOK	MOSS LANE TO IRWELL	1.3	No Objective	RE4
SINGING CLOUGH BROOK	WORSLEY ROAD TO IRWELL	1.9	No Objective	RE4
CROAL	CROAL MINOR TO IRWELL	4.2	RE4 1997	RE3
CROAL	TONGE/BRADSHAW BK TO CROAL MINOR	0.7	RE3 1997	RE3
TONGE	ASTLEY BROOK TO BRADSHAW BROOK	3.9	RE3 1997	RE3
BLACKSHAW BROOK	HALL LANE TIP TO CROAL	0.6	RE3 1997	RE3
BLACKSHAW BROOK	RED BRIDGE TO HALL LANE TIP	3.3	RE3 M 1997	RE2
CROAL MINOR	CAPTAINS CLOUGH TO CROAL	3.2	RE5 1997	RE3
MIDDLE BROOK	HEATONS BRIDGE TO CAPTAINS CLOUGH	3.8	RE3 1997	RE3
MIDDLE BROOK	RED MOSS TO HEATON BRIDGE	4.7	RE3 1997	RE3
CAPTAINS CLOUGH	DOFFCOCKER LODGE TO MIDDLE BK	3.4	RE4 1997	RE3
BRADSHAW BROOK	BRADSHAW BROW TO TONGE	5.2	RE2 1997	RE2
BRADSHAW BROOK	JUMBLES RESVR. TO BRADSHAW BROW	3.5	RE2 1997	RE2
BRADSHAW BROOK	WAYOH RESVR. TO JUMBLES RESVR.	1.6	RE2 1997	RE2
QUARLTON BROOK	EDGEWORTH TO BRADSHAW BROOK	1.1	RE2 1997	RE2
ASTLEY BROOK	A666 TO EAGLEY BROOK	0.5	RE3 M 1997	RE3
ASTLEY BROOK	SMITHHILLS DEAN ROAD TO A666	1.7	RE2 1997	RE2

River	Stretch	Length (km)	Short Term RQO	Long Term RQO
EAGLEY BROOK	BELMONT STW TO CHARLES TURNER	1.3	RE2 M 1997	RE2
EAGLEY BROOK	BELMONT RESEVR. TO BELMONT STW	1.6	RE2 1997	RE2
ELTON BROOK	DOW LANE TO IRWELL	1.9	RE3 M 1997	RE3
KIRKLEES BROOK	OLIVES PAPER MILL TO IRWELL	0.7	RE3 1997	RE3
KIRKLEES BROOK	BROOKHOUSE BRIDGE TO OLIVES PAPER	3.8	RE2 1997	RE2
PIGS LEE BROOK	A56 TO IRWELL	0.9	RE3 1997	RE3
HOLCOMBE BROOK	REDISHER CLOSE TO IRWELL	1.3	RE2 1997	RE2
DEARDEN BROOKS	COUT MOOR RESVR. TO IRWELL	4.2	RE2 1997	RE2
OGDEN	SWINNEL BROOK TO IRWELL	2.8	RE3 1997	RE3
OGDEN	HOLDENWOOD RESVR. TO SWINNEL BK	0.4	RE2 1997	RE2
SWINNEL BROOK	HUD HEY ROAD TO OGDEN	2.7	RE3 1997	RE3
LIMY WATER	LOVECLOUGH TO IRWELL	5.1	RE3 M 1997	RE3
LIMY WATER	CLOW BRIDGE TO LOVECLOUGH	2.2	RE4 1997	RE2
WHITEWELL BROOK	SHAWCLOUGH BROOK TO IRWELL	1.6	RE3 1997	RE2
WHITEWELL BROOK	CLOUGH BOTTOM TO SHAWCLOUGH BK	4.4	RE2 M 1997	RE2
COWPE BROOK	HIGHER BOARSGREAVE TO IRWELL	1.4	RE2 1997	RE2
BRIDGEWATER CANAL	WATERS MEETING TO ROCHDALE CANAL	3.6	RE 3 1997	RE3
BRIDGEWATER CANAL	TRAFFORD PARK TO WATERS MEETING	2.5	RE3 1997	RE3
BRIDGEWATER CANAL	ASTLEY GREEN TO TRAFFORD PARK	10	RE3 M 1997	RE3

M - Marginal failure of the proposed objective
 River Ecosystem (RE) River Quality Objectives (RQOs) for the River Irwell and River Croal

What we do

The Environment Agency's work is divided into seven main functions:

Flood Defence has the role of protecting people and the developed environment from flooding by providing effective defences and protection of floodplains. Safeguarding life is its highest priority and to meet this aim it provides a flood forecasting and warning service. Flood Defence also has an aim to protect and enhance the natural environment by promoting projects that are sustainable and work with nature.

The **Water Resource** function comprises the conservation, redistribution and augmentation of surface and groundwater supplies. It includes the powers to encourage water conservation and to promote transfer schemes and to balance the needs of water users and the environment by issuing licences for users to abstract water from rivers and boreholes.

The **Pollution Control** function includes:

Integrated Pollution Control (IPC) regulating the most polluting, or technologically complex, industrial and other processes in air, on land or in water.

Water Quality and pollution control which prevents and controls pollution and monitors the quality of rivers, estuaries and coastal waters.

Radioactive Substances regulating the disposal of radioactive material, including that from licensed nuclear sites, and regulating the accumulation, keeping and use of radioactive materials, except from licensed nuclear sites.

Waste Regulation setting consistent standards for waste management practice to regulate the treatment, storage, movement and disposal of controlled waste. The Agency also has a requirement to register and monitor those who produce waste imposing obligations to re-use, recover or recycle products and materials.

Reporting on the extent of contaminated land and contributing to its management (primarily undertaken by local authorities).

Abandoned mine operators are also required to work with the Agency so that steps can be taken to prevent minewater pollution in the future.

The Environment Agency is responsible for maintaining, improving and developing **Fisheries**. This is carried out by licensing, regulation and enforcement schemes which cover salmon, sea trout, non-migratory trout, coarse and eel fisheries. The Agency also carries out improvements to fisheries by improving the habitat, fish stocks and providing advice to fishery owners.

The **Navigation** function is responsible for managing and improving over 800km of inland waterways, the non-tidal Thames, the Harbour of Rye and Dee Estuary. Its aim is to make these resources widely available to the public for water or land based recreational use.

The Agency must also take account of **Recreation** and access. Over 1000 sites in our control are managed for recreational use. We also have a general duty to promote the recreational use of water and land throughout England and Wales.

In fulfilling all its functions the Environment Agency is required to contribute to the **Conservation** of nature, landscape and archaeological heritage. We have a regard to conserving and enhancing flora, fauna, geological or physiographical features when carrying out our pollution control functions, and a duty to further conservation when carrying out our other functions. We also have a duty generally to promote the conservation of flora and fauna dependent on the aquatic environment.

What we do not do

The Environment Agency does not cover all aspects of environmental legislation and service to the general public. Your local authority deals with all noise problems, household and commercial waste collections, air pollution arising from vehicles, household areas, small businesses and small industries and litter.

Planning permission is the responsibility of your local authority who will contact the Environment Agency when necessary. The local authorities also deal with contaminated land issues in liaison with the Environment Agency.

Environmental Health issues should also be directed to your local authority - details can be found in your local telephone directory.

Sewage treatment is carried out by Thames Water Utilities Ltd and the supply of potable water is the responsibility of your local water company.

Further Information

Further information on the work of the Agency can be found in a series of Agency strategy documents covering water quality, water resources, flood defence, fisheries, conservation, navigation, recreation, and research and development. These documents are available from the Corporate Planning Section at the Agency's head office in Bristol. Fact Files on rivers and functions and other leaflets may also be obtained from South East Area offices (01932-789833).

We maintain several public registers which can be inspected at most Environment Agency offices. Information is usually provided free of charge, but for large and complex requests we may charge for staff time and materials. There are also standard charges for some specific searches. Further details about our public registers and the types of information we hold are available in our leaflet A Guide to Information Available to the Public. Copies are available from the Public Relations Department in Reading or the South East Area office.

At present, offices may have information relevant only to their local area; please call before you visit to ensure that the information you want is available at your local office.

Some environmental details and information about our public registers are available on the internet on <http://www.environment-agency.gov.uk>

NORTH WEST REGION ADDRESSES

REGIONAL OFFICE

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PO Box 12
Richard Fairclough House
Knutsford Road
Warrington WA4 1HG
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Fax: 01925 415 961

NORTH AREA OFFICE

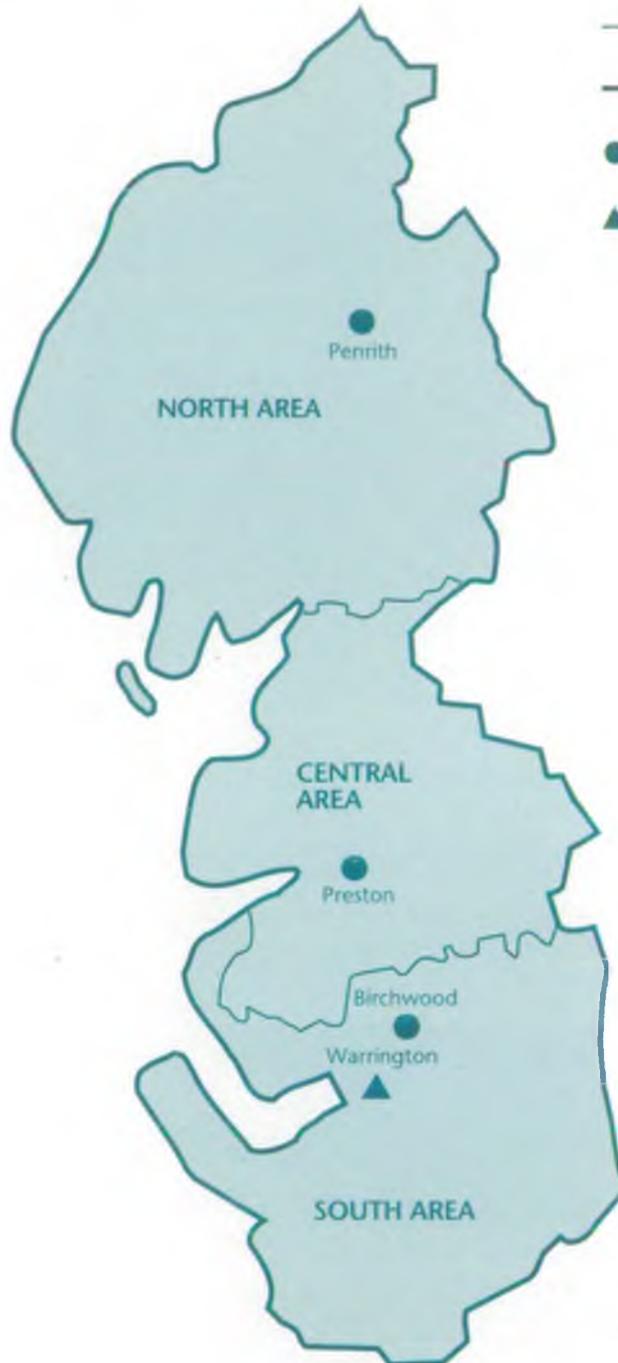
Environment Agency
Ghyll Mount
Gillan Way
Penrith 40 Business Park
Penrith
Cumbria CA11 9BP
Tel: 01768 866666
Fax: 01768 865606

CENTRAL AREA OFFICE

Environment Agency
Lutra House
PO Box 519
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Lancashire
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Tel: 01772 339 882
Fax: 01772 627 730

SOUTH AREA OFFICE

Appleton House
430 Birchwood Boulevard
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Cheshire WA3 7WD
Tel: 01925 840 000
Fax: 01925 852 260



— Area Administrative Boundaries

— Regional Boundary

● Area Office

▲ Regional Headquarters

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

ENVIRONMENT AGENCY
GENERAL ENQUIRY LINE

0645 333 111

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

ENVIRONMENT AGENCY
EMERGENCY HOTLINE

0800 80 70 60



ENVIRONMENT
AGENCY



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