

**Croal/Irwell
Local Environment
Agency Plan
Environmental Overview
October 1998**

NW - 10/98-250-C-BDBS



**ENVIRONMENT
AGENCY**

ENVIRONMENT AGENCY

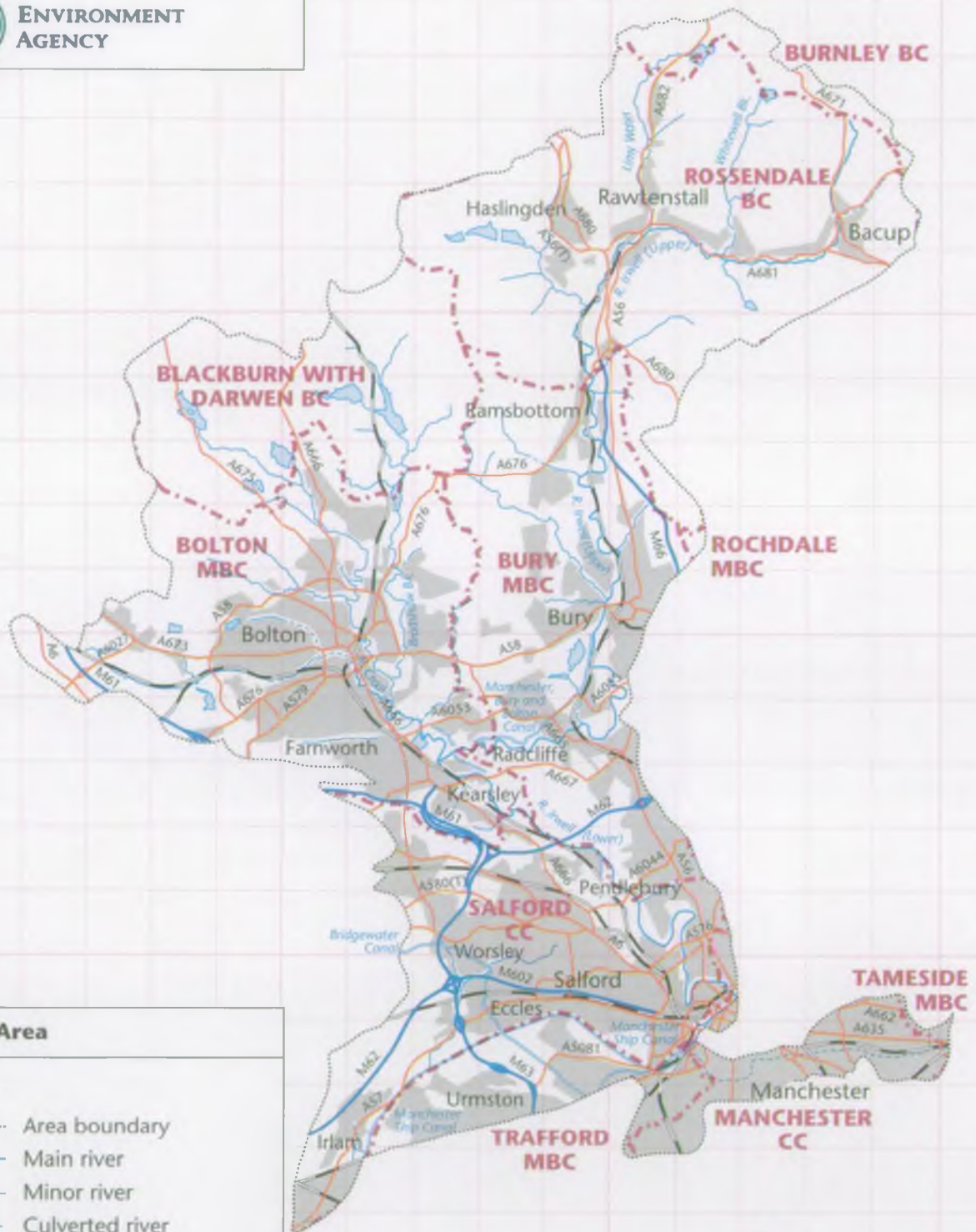


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**Croal/Irwell
Local Environment Agency Plan
Map 1**



**ENVIRONMENT
AGENCY**



The Area

KEY

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

Contents

Croal/Irwell Local Environment Agency Plan (LEAP) Environmental Overview Contents

1.1	Introduction	1
1.2	Air Quality	2
1.3	Water Quality	7
1.4	Effluent Disposal	12
1.5	Hydrology	15
1.6	Hydrogeology	17
1.7	Water Abstraction - Surface and Groundwater	18
1.8	Area Drainage	20
1.9	Waste Management	29
1.10	Fisheries	36
1.11	Ecology	38
1.12	Recreation and Amenity	45
1.13	Landscape and Heritage	48
1.14	Development	50
1.15	Radioactive Substances	56
1.16	Agriculture	57
	Appendix 1 - Glossary	60
	Appendix 2 - Abbreviations	66
	Appendix 3 - River Quality Objectives (RQOs)	68
	Appendix 4 - Environment Agency Leaflets and Reports	71

Maps

Number	Title	Adjacent to Page:
1	The Area	Cover
2	Integrated Pollution Control (IPC)	3
3	Water Quality: General Quality Assessment Chemical Grading 1996	7
4	Water Quality: General Quality Assessment: Biological Grading 1995	8
5	Water Quality: Compliance with proposed Short Term River Ecosystem RQOs	9
6	Water Quality: Compliance with proposed Long Term River Ecosystem RQOs	10
7	EC Directive Compliance	11
8	Effluent Disposal	12
9	Rainfall	15
10	Hydrometric Network	16
11	Summary Geological Map: Geology at Surface (simplified)	17
12	Licensed Abstractions >0.5 Megalitre per day	18
13	Flood Defence: River Network	21
14	Flood Defence: River Corridor Land Use Plan	25
15	Flood Defence: Capital Works	26
16	Flood Defence: Flood Risk Areas	27
17	Licensed Operational Landfill Sites and Major Treatment Plants	33
18	Fisheries: River Habitat Potential and Actual Fish Species Recorded	37
19	Designated Sites of Conservation Interest	39
20	Recreation and Amenity Sites Associated with Water	46
21	Landscape and Heritage	49
22	Local Authority Boundaries	51
23	Radioactive Substances (RAS) Sites	56
24	Land Cover	57

Figures and Tables

Figures

Number	Title	Page:
1	Seasonal Variation in Rainfall	15
2	Typical Soil Moisture Deficit (1993)	16
3	Monthly Mean Flow (ML/d) River Irwell, Adelphi Weir,	16

Tables

Number	Title	Page:
1	Summary of Real-Time Air Quality Monitoring Sites and Pollutants	5
2	Summary of Non Real-Time Air Quality Monitoring Sites and Pollutants	5
3	Annual Averages for Sulphur Dioxide (SO ₂), Smoke and Nitrogen Dioxide (NO ₂) in Air	6
4	General Quality Assessment (GQA) Scheme for Biology	8
5	Physical Features Within the LEAP Area	24
6	Distribution of Maintenance Expenditure	24
7	Recycling by Local Authorities in 1995/96	34
8	Local Authority Administration in the LEAP Area	50
9	Current State of Development Plan Preparation Within the LEAP Area	52
10	River Ecosystem (RE) River Quality Objectives (RQOs) for the River Irwell and River Croal	69

1.1 Introduction

This document contains environmental information relating to the Croal/Irwell Local Environment Agency Plan (LEAP) area and will support the issues and actions put forward in the Croal/Irwell LEAP Consultation Report and Plan. The information included here relates to the Environment Agency's responsibilities and details the current uses, resources and pressures of the area as we see them. The document is not intended to be a complete Environmental Assessment of the area.

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1.2 Air Quality

General

Air quality is an indicator of environmental quality. Air pollution can damage flora and fauna, as well as buildings and can have significant effects on soil and water. It can also cause serious problems for those with asthma, bronchitis and other respiratory diseases.

Air pollution may be as gas or particulate matter. Its dispersion and dilution depend on climatic conditions. Its impact may be local, especially regarding particulate matter that will often settle on nearby land or water or may be global, for example affecting the ozone layer or the concentration of greenhouse gases such as carbon dioxide.

The Role of the Agency

The Environment Agency has wide powers, but will need to work closely with others if environmental improvements are to be achieved. The Agency will need to look at partnerships with national and local government, business, industry and environmental and conservation groups to maximise its influence in securing environmental improvements. This is particularly important with regard to local air quality, where the Agency is only one of a number of regulatory bodies.

The Local Authorities have primary responsibility for local air quality.

The Environment Agency has powers to regulate air quality principally by operating a system called Integrated Pollution Control (IPC) for certain industrial processes which stems from Part 1 of the Environmental Protection Act 1990 (EPA90). The processes regulated are the potentially most polluting industrial processes including large combustion plant, iron and steel making, the chemical industry, solvent recovery and incineration plants. Nationally there are approximately 2,500 of such licenced processes, of which there are 64 in the area covered by this LEAP.

Within the Croal/Irwell LEAP area there are 11 processes in Trafford MBC, 26 in Salford CC, 8 in Manchester CC, 9 in Bury MBC, 5 in Bolton MBC, 4 in Rossendale BC and 1 in Blackburn BC. By process type there are 29 for the production of organic chemicals, 11 for the production of inorganic chemicals, 2 for textile treatment, 3 di-isocyanate processes, 6 for the manufacture of paper, 3 non-ferrous metal processes, 1 for the manufacture of glass fibre, 3 combustion processes, 3 for solvent recovery, 1 incinerator, 1 processes for manufacturing asbestos containing products and 1 for timber treatment.

The incineration process is Bolton Municipal Waste Incinerator operated by GM Waste Ltd which at present is not operating because it is being modified using the best available techniques not entailing excessive cost, so that the releases to air satisfy the latest European Union (EU) Directive for Municipal Waste Incineration and are minimised and rendered harmless in the environment. The Agency will not allow the incinerator to commence operation again until it is satisfied that the releases to air have been minimised and rendered harmless.

1.2 Air Quality

The objective of IPC is to develop an approach to pollution that considers releases to all media from industrial processes in the context of the affect on the environment as a whole. This is to ensure that where releases to the environment cannot be avoided, the release is to the media that offers the Best Practicable Environmental Option (BPEO).

Under the IPC arrangements, the Agency places in the IPC public register the following: -

- applications for authorisations;
- representations from statutory consultees;
- authorisations including limits set on releases;
- monitoring information required by conditions of an authorisation;
- any enforcement action or prosecutions taken by the Agency.

The Agency also regulates landfill sites and in particular landfill gas which is a product resulting from chemical and biological breakdown at waste sites. This gas is principally a mixture of methane and carbon dioxide, both of which are greenhouse gases.

The Role of other Organisations

The Department of the Environment Transport and the Regions (DETR) enforces controls on vehicle manufacturers.

The Health and Safety Executive regulates the nuclear industry by issues site licences and monitoring their operations.

The County Council Structure Plan contains policies on the need to control pollution and the County Analysts provide an analytical service for District Council Environmental Health Officers (EHOs).

District Councils environmental health departments regulate air pollution from a large number of industrial premises under Part 1 of the Environmental Protection Act 1990. These are premises with a lower potential to pollute than those regulated by the Agency. The processes are designated as Part B processes under the Act, but Local Authorities can only regulate releases to air, whereas processes controlled by the Agency are regulated for releases to all environmental media. District Councils also have powers to deal with nuisances from a wide range of non-industrial activities, such as smells from domestic and agricultural premises, smoke from outdoor cable burning and noise pollution.

The Police are responsible for controlling emissions from vehicles.

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

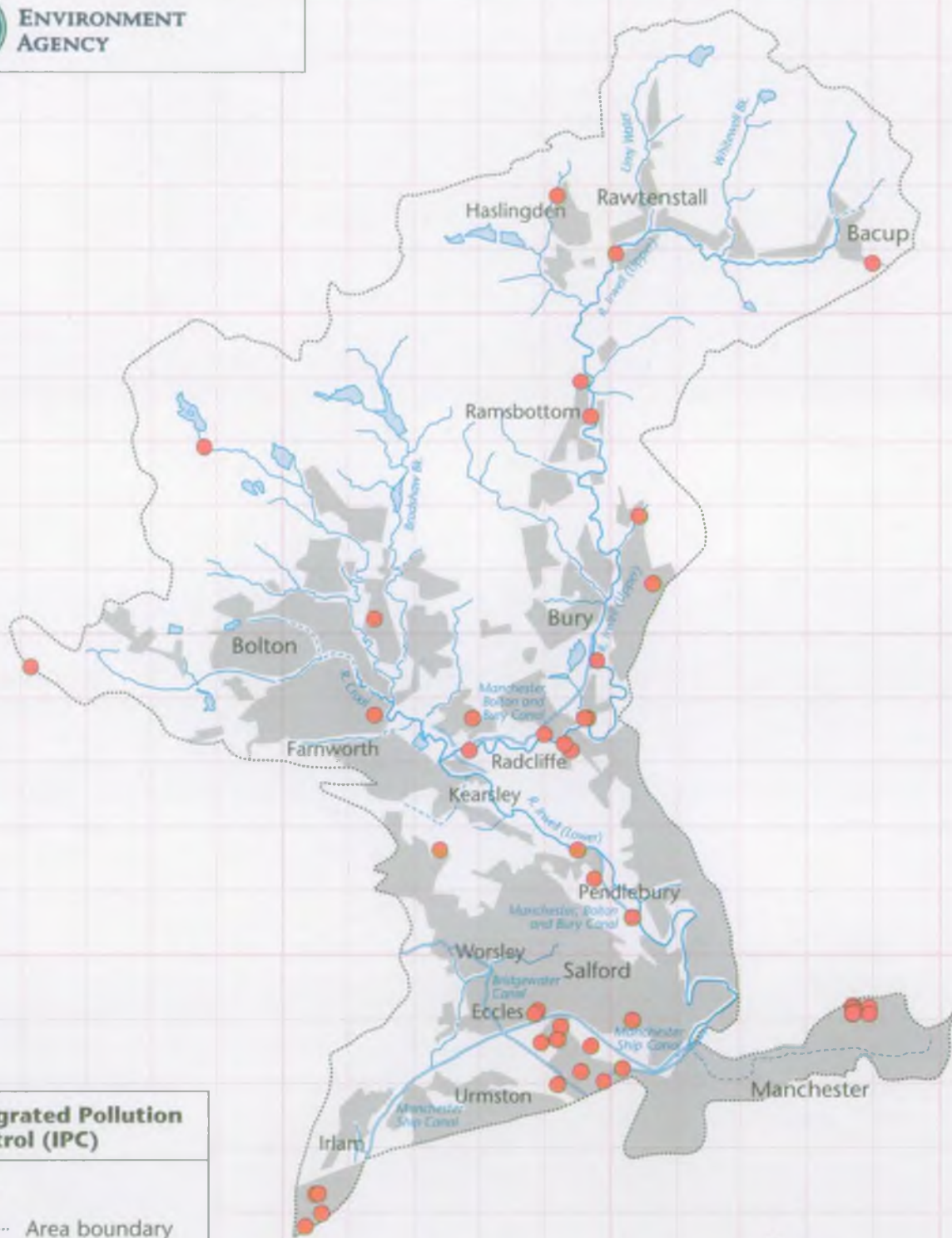


**ENVIRONMENT
AGENCY**

**Integrated Pollution
Control (IPC)**

KEY

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



1.2 Air Quality

The Local Authorities and the National Air Quality Strategy

Under Part 4 of the Environment Act 1995 the Government was required to publish a national strategy for air quality including:

- a framework of standards and objectives for the pollutants of most concern
- a timetable for achieving objectives
- the steps the Government is taking and the measures it expects others to take to see that objectives are met.

The strategy was published in March 1997.

The Environment Act 1995 also laid the foundations for a nationwide system of local air quality management, in which local authorities are obliged to review and assess the quality of air in their areas, and to take action where air quality standards or objectives are breached or at risk of being breached. The standards and objectives are defined in the Air Quality Regulations 1997 and are to be achieved throughout the UK by 2005. The standards reflect advice from the EU and WHO and take into account potential risks, costs and technical feasibility.

To ensure that the standards and objectives of the Air Quality Regulations are met it will be necessary for local authorities to carry out periodic reviews of air quality. Where standards are not being met an Air Quality Management Area should be declared, and an action plan produced to improve air quality. This will require objective assessments together with appropriate monitoring and modelling studies. The Agency is providing details of the processes it regulates together with air emissions data from them, to local authorities to assist with into modelling studies.

The Agency will ensure that releases to air from industrial processes which it regulates will have IPC authorisations issued for new processes with appropriate conditions for achieving the objective of compliance with the air quality standards. Conditions for existing IPC authorised processes will be reviewed and varied as necessary. The whole burden of compliance with an air quality standard will not be put solely onto industry where it is not the major source of the pollutant.

Local Perspective

Air quality monitoring is undertaken in the LEAP area by seven local authorities, Manchester CC, Salford CC, Bolton MBC, Bury MBC, Trafford MBC, Rossendale BC and Blackburn BC as real - time and non real - time air quality monitoring. This is summarised in tables 1 to 3 below.

1.2 Air Quality

Table One Summary of Real - Time Air Quality Monitoring Sites and Pollutants

Local Authority	Pollutant Monitored
Manchester	Oxides of Nitrogen, Particulates, Sulphur Dioxide, Carbon Monoxide
Salford	Oxides of Nitrogen, Particulates, Sulphur Dioxide, Carbon Monoxide, Ozone
Bolton	Oxides of Nitrogen, Particulates, Sulphur Dioxide, Carbon Monoxide, Ozone
Bury	Oxides of Nitrogen, Particulates, Sulphur Dioxide, Carbon Monoxide, Ozone
Trafford	No real-time monitoring carried out in LEAP Area
Rossendale	No real-time monitoring carried out in LEAP Area
Blackburn	No real-time monitoring carried out in LEAP Area

Table Two Summary of Non Real-Time Air Quality Monitoring Sites and Pollutants

Area	Smoke	SO ₂	NO _x	Lead	Benzene	Particulates
Manchester	2	2	2	1	1	1
Salford	1	1	9	5		3
Bolton	4	5	18	2	4	7
Bury	4	4	6	2	1	
Trafford	11	11	11	8		
Rossendale	2	2	5			
Blackburn	No monitoring in this LEAP area					

Table 3 Annual Averages for Sulphur Dioxide (SO₂), Smoke and Nitrogen Dioxide (NO₂), in Air (micrograms per cubic metre)

Location	1995/6		
	SO ₂	Smoke	NO ₂
Bacup	14	8	-
Bolton	22	10	56
Bury	43	15	46
Farnworth	25	17	45
Horwich	19	10	36
Manchester	26	14	43
Rawtenstall	15	13	40
Swinton	19	12	36
Trafford	50	11	38

Further details of air quality monitoring can be obtained from the Local Authorities.

1.3 Water Quality

General

The Environment Agency has a statutory responsibility under the Water Resources Act, 1991 and some European Union (EU) Directives to monitor the pollution of controlled waters. Controlled waters include rivers, streams, lakes, ditches, groundwaters, estuaries and coastal waters. This is achieved by comprehensive chemical and biological sampling programmes.

Water Quality information is available on the Public Register, at the Environment Agency offices, and can be obtained by contacting the Customer Service Department at the Sale Office or the North West Regional Office at Richard Fairclough House, Knutsford Road, Warrington.

The chemical quality and the aquatic life in the Irwell and Croal catchments are monitored regularly in a routine program. This allows the water quality to be categorised and targets set relating to the Agency's River Quality Objectives (RQOs) or General Quality Assessment (GQA) classification schemes. Sampling for obligations arising from EU Directives is undertaken for assessment.

Pollution is controlled at source by a number of means:

- The discharge of effluent to a watercourse is allowed only with the consent of the Agency. Conditions are attached to discharges to control the impact on receiving watercourses.
- Inspections of farm and industrial sites are carried out and, where appropriate, improvements are recommended to reduce the risk of pollution.
- During the consultation process with local authorities, the Agency gives advice regarding pollution control requirements to be included in planning permissions, Integrated Pollution Control authorisations and waste management licences.
- The Agency is also consulted by, and directs North West Water Ltd on the ongoing programme of sewerage and sewage treatment improvements.

The agency provides a 24 hour response to pollution incidents.

General Quality Assessment

The Agency's scheme is used to make periodic assessments of water quality in order to report trends, both over time and between different rivers in England and Wales. Different aspects of water quality are referred to as 'windows'. Currently the scheme reports using the chemical and biological windows, the nutrient and aesthetics windows are still in development.

Chemical Window - the GQA grades shown on the map indicate a variation in the chemical quality of the rivers in the area. It can be seen that to some extent the changes in water quality relate to centres of population.

**Croal/Irwell
Local Environment Agency Plan
Map 3**

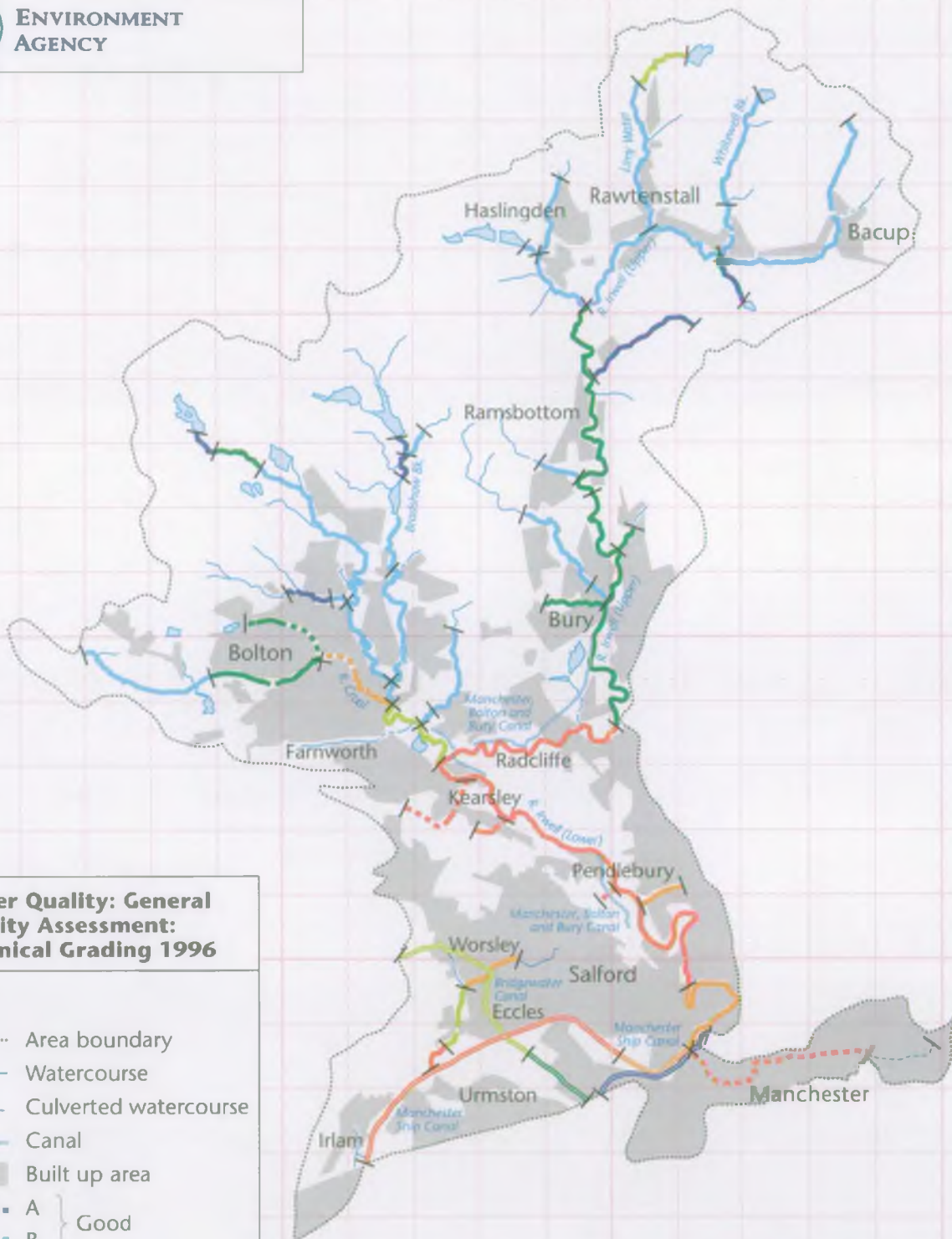


**ENVIRONMENT
AGENCY**

**Water Quality: General
Quality Assessment:
Chemical Grading 1996**

KEY

- Area boundary
- Watercourse
- - - Culverted watercourse
- Canal
- Built up area
- A } Good
- B }
- C } Fair
- D }
- E } Poor
- F } Bad
- - - Unclassified
- Reach Boundary



**Croal/Irwell
Local Environment Agency Plan
Map 4**

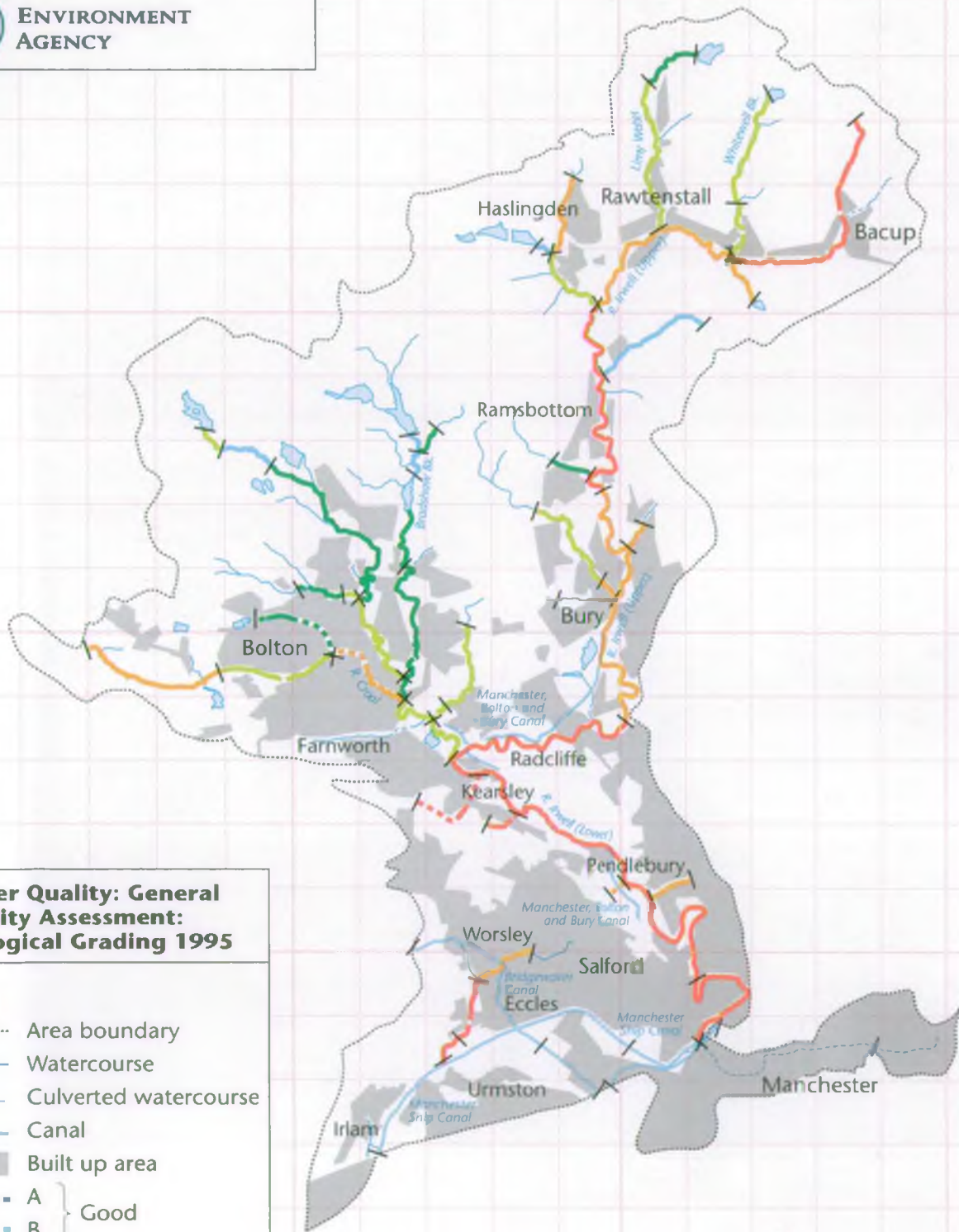


**ENVIRONMENT
AGENCY**

**Water Quality: General
Quality Assessment:
Biological Grading 1995**

KEY

- Area boundary
- Watercourse
- - - - - Culverted watercourse
- Canal
- Built up area
- A } Good
- B }
- C } Fair
- D }
- E } Poor
- F } Bad
- - - - - Unclassified
- Reach Boundary



1.3 Water Quality

Biological Window - aquatic invertebrates sampled routinely from all classified rivers provide a basis for the biological GQA grades as shown in the following table. Like the chemical GQA grades, this is a six tier system, however the two are not directly comparable. Biological classification is capable of detecting toxic and intermittent pollution which can be missed by chemical monitoring, and also of highlighting habitat degradation.

Table 4 General Quality Assessment Scheme for Biology

Grade	Outline Description
a - Very Good	Biology similar to (or better than) that expected for an average and unpolluted river of this size, type and location. High diversity of taxa, usually with several species in each. Rare to find dominance of any one taxon.
b - Good	Biology falls a little short of that expected for an unpolluted river. Small reduction in the number of taxa that are sensitive to pollution. Moderate increase in the number of individuals in the taxa that tolerate pollution.
c - Fairly Good	Biology worse than expected for an unpolluted river. Many sensitive taxa absent, or number of individuals reduced. Marked rise in numbers of individuals in taxa that tolerate pollution.
d - Fair	Sensitive taxa scarce and contain only small numbers of individuals. A range of pollution tolerant taxa present, some with high numbers of individuals.
e - Poor	Biology restricted to pollution tolerant species with some taxa dominant. Sensitive taxa rare or absent.
f - Bad	Biology limited to a small number of very tolerant taxa such as worms, midge larvae, leeches and water hoglouse, some may be present in very high numbers. In the worst case, there may be no life present.

Biological Water Quality

In the upper reaches of many of the Irwell tributaries; Whitewell Brook, Limy Water, Cowpe Brook, Kirklees Brook and the River Ogden in particular; the aquatic invertebrate communities are diverse and consist of a wide variety of pollution sensitive species, including stonefly nymphs, mayfly nymphs and caddis fly larvae. However, the headwaters of the Irwell itself and the tributary Greave Clough Brook, are heavily influenced by the effects of minewater discharges.

Below Bacup, invertebrate diversity shows some improvement towards the Cowpe Brook confluence, with an increase in species variety. The lower reaches of Cowpe Brook, and the section of the Irwell from the Cowpe Brook confluence to the Kirklees Brook confluence, show a dramatic decrease in water quality. This is believed to be linked, certainly in part, to the presence of pesticides in the river.

Downstream of the Kirklees Brook confluence some recovery is evident. Diversity is still restricted but there is an increase in the abundance of the more pollution tolerant organisms.

1.3 Water Quality

The aquatic invertebrate communities present in the Lower Irwell, Slack Brook and Singleton Brook, are of restricted diversity and include large numbers of pollution tolerant organisms, for example freshwater hog lice, Chironomid midge larvae and tubificid worms.

Singing Clough Brook and Unity Brook have particularly poor aquatic invertebrate communities, consisting of only a small number of pollution tolerant taxa. This reflects the poor water quality found there.

The situation in Worsley Brook and Folly Brook is slightly better, however the Eccles WwTW discharge does have a significant impact on the invertebrate communities in the lower reaches of Worsley and Saltey Brooks.

In general, the Croal catchment supports a higher invertebrate diversity than the other Irwell sub-catchments with a wide variety of organisms present at most sites, including many pollution sensitive species. There is, however, some reduction in diversity in and downstream of Bolton town centre, reflecting changes in water quality and an increase in organic enrichment.

River Quality Objectives

The Agency has strategic targets known as River Quality Objectives (RQOs) which provide a basis for water quality management decisions. The first set of standards to be developed, in the River Ecosystem (RE) scheme, relate to the chemical quality requirements for different aquatic ecosystems. Details of the scheme and the standards are given in Appendix 3.

The definition of the RE classes in chemical terms can be equated with particular reference to fish populations, which could be expected to be supported by the ecosystem.

Class RE1:	Water of very good quality (suitable for all fish species)
Class RE2:	Water of good quality (suitable for all fish species)
Class RE3:	Water of fair quality (suitable high class coarse fish populations)
Class RE4:	Water of fair quality (suitable for coarse fish populations)
Class RE5:	Water of poor quality (likely to limit coarse fish populations)
No Class	Water of bad quality (in which fish are unlikely to be present)

For the classified watercourses of the Irwell and Croal short term and long term RE RQOs have been proposed. Short term objectives must be achievable within a ten year horizon of committed investment or by the actions of the Agency or others. Long term objectives have also been proposed which reflect the achievable aspirations for the water quality. Achievement of these objectives may take more than ten years and require currently uncommitted expenditure.

The chemical quality of the watercourses in the LEAP is varied with streams in the Upper Irwell and parts of the Croal being of good quality and designated as salmonid fisheries. In other areas, most notably where there are large populations, the water quality can be very poor. The main sources of pollution are from effluent discharges such as from waste water treatment works,

**Croal/Irwell
Local Environment Agency Plan
Map 5**

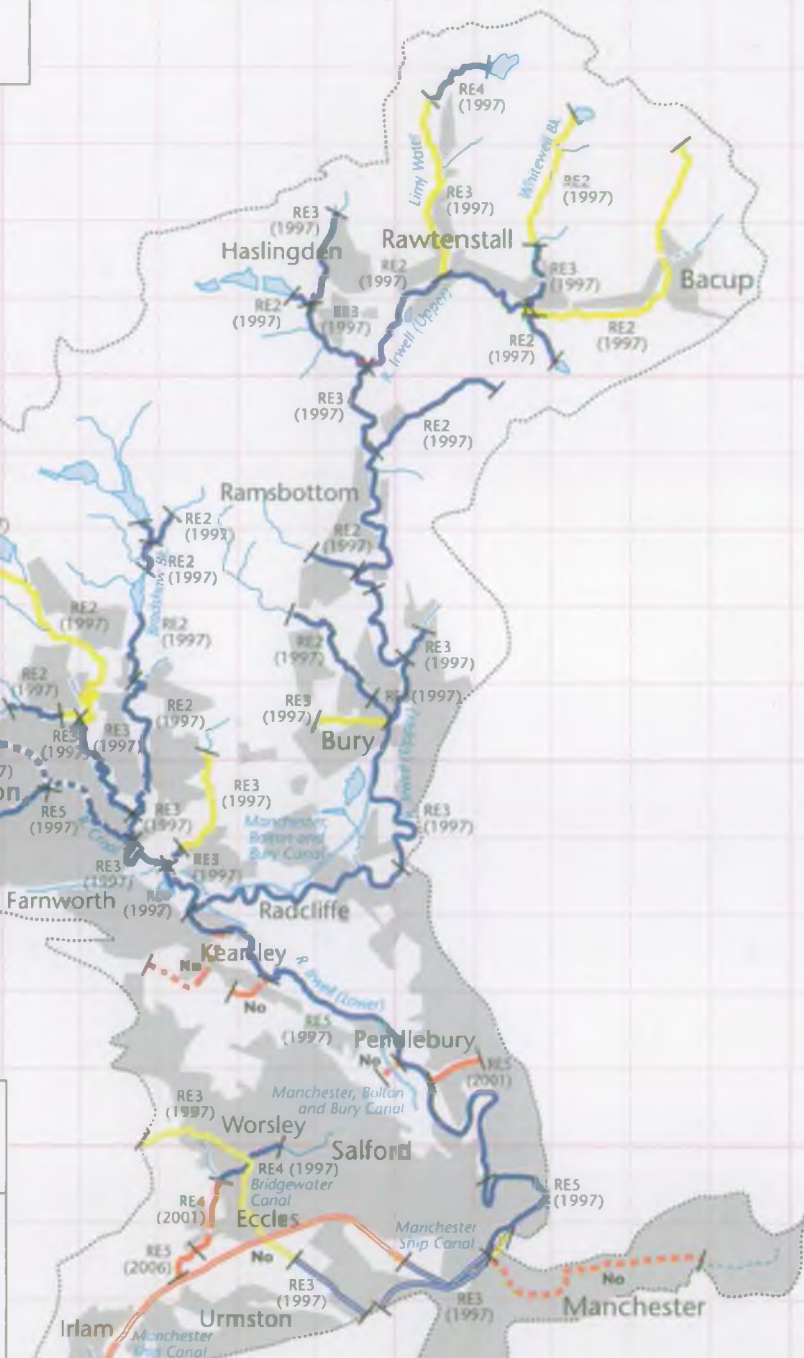


**ENVIRONMENT
AGENCY**

**Water Quality: Compliance
with proposed Short Term
River Ecosystem RQOs**

KEY

- | | | | |
|--------------|-----------------------|--------------|--|
| | Area boundary | | |
| — | Watercourse | | |
| - - - | Culverted watercourse | | |
| — | Canal | | |
| ■ | Built up area | | |
| River | | Canal | |
| RE () | Objective (date) | RE () | |
| — | Compliant | — | |
| - - - | Marginal failure | - - - | |
| — | Significant failure | — | |
| — | Reach boundary | | |
| No | No objective proposed | | |



**Croal/Irwell
Local Environment Agency Plan
Map 6**

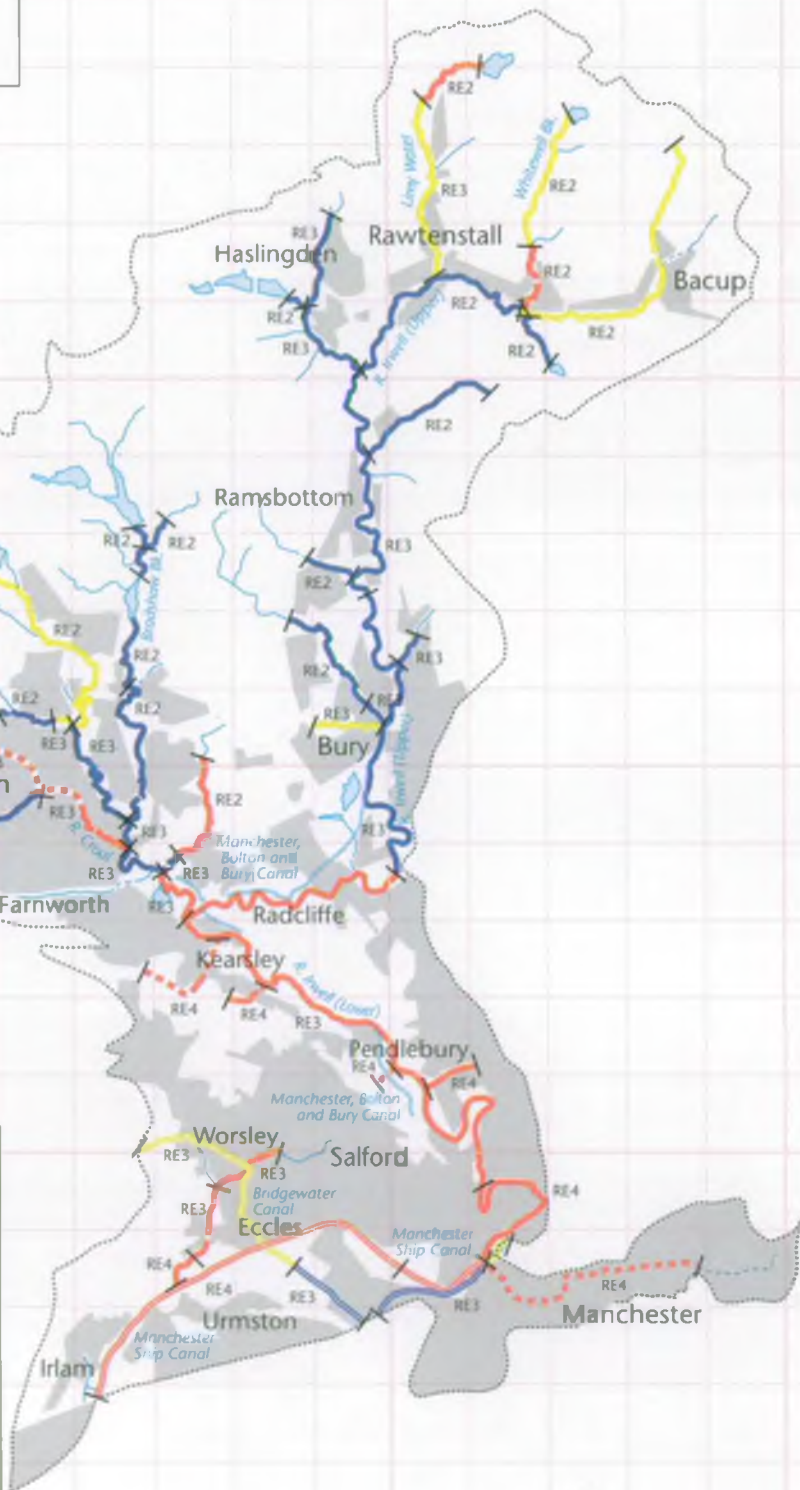


**ENVIRONMENT
AGENCY**

**Water Quality: Compliance
with proposed Long Term
River Ecosystem RQOs**

KEY

- | | | | |
|--------------|-----------------------|--------------|--|
| | Area boundary | | |
| — | Watercourse | | |
| - - - | Culverted watercourse | | |
| — | Canal | | |
| ■ | Built up area | | |
| River | | Canal | |
| RE () | Objective (date) | RE () | |
| — | Compliant | — | |
| — | Marginal failure | — | |
| — | Significant failure | — | |
| — | Reach boundary | | |



1.3 Water Quality

industry and overflows on the sewerage system.

There are other pollution sources that have a more local impact including run-off from contaminated land and drainage from abandoned mines. Drainage from urban areas can have a significant effect on smaller watercourses. Contaminated surface water discharges and storm water run-off from roads and domestic or commercial properties cause pollution. Natural acidic run-off in the headwaters, contaminated run-off from farming also have a localised impact.

Run-off via storm drains from streets, commercial and residential properties have a significant impact on water quality in urban areas.

The Environment Agency and its predecessor aim to reduce pollution to achieve the River Quality Objectives and improve the aquatic ecosystem.

EU Directives

The Following EU Directives contain standards that have implications for water quality within the area of the plan. Map 7 shows the EU Directive monitoring points and designated stretches.

a) Directive on Urban Waste Water Treatment (91/271/EEC)

The Directive specifies requirements for the collection and treatment of industrial and domestic wastewater at sewage treatment works. It also covers treatment of wastewater from certain sectors of industry prior to direct discharge to a watercourse.

The directive specifies secondary treatment for all treatment facilities serving population equivalents greater than 2000 by the year 2005. Interpretation of the directive in the UK means that nearly all significant inland Waste water Treatment Works, (WwTWs) will already comply with all the requirements. In addition waters that receive a WwTW discharge greater than 10 000 population equivalent may be designated as 'sensitive' under the directive if they are eutrophic, are used for public supply and contain more than 50 mg/l nitrate. There are presently no designated 'sensitive areas' in the Irwell and Croal catchments but future designations are under review.

The requirement for collecting systems (sewerage networks) is that they be designed, constructed and maintained in accordance with best technical knowledge not entailing excessive cost. This is with particular regard to the limitation of pollution in the receiving

water due to storm (and emergency) overflows. This presents a very significant objective to be met.

b) Directive on Dangerous Substances (76/464/EEC)

This Directive provides a frame work for measures to control water pollution from discharges of certain dangerous substances, sub-divided under List I and List II. Member States of the EU are

1.3 Water Quality

required to take steps to eliminate pollution by List I substances and reduce pollution by List II substances.

UK Environmental Quality Standards (EQSs) have been established for concentrations of these substances in watercourses. Limits for discharges containing the substances have been set according to dilutions available.

In the catchment in 1997 two EQS failures for copper have been identified on the Irwell at Stubbins and Eagley Brook. In both cases the levels are attributed to natural enrichment, surveys to determine if there are any other possible sources are to be undertaken. A failure of the EQS for permethrin was recorded at Stubbins. (Please refer to the Croal/Irwell LEAP Consultation Report, Issues 12 and 14).

c) Freshwater Fish Directive (78\659\EEC)

The Directive sets Environmental Quality Standards (EQSs) for stretches of freshwater designated as suitable for either salmonids (salmon and trout species) or cyprinids (coarse fish species). It is concerned with ensuring that the water quality in designated stretches of water is suitable for supporting fisheries.

In addition for each fishery type there are two sets of standards. The imperative (I) standard specifies what must be achieved, and guideline (G) standards which should be met.

Eleven salmonid stretchers of water are designated, eight in the upper Irwell and three on the Croal.

d) Surface Water Abstraction Directive (75\440\EEC)

This Directive ensures that surface water used for drinking water meets certain standards and is given adequate treatment before entering public supplies. The Directive sets out imperative standards which must be achieved, and guideline standards which Member States should aim to achieve. Surface waters are divided into three categories A1, A2, and A3 which reflect the method of treatment received to meet the required quality for potable water supply.

There are nine monitoring sites in the area on the main reservoirs shown on the map, four in the Croal and the remaining five in the Upper Irwell.

**Croal/Irwell
Local Environment Agency Plan
Map 7**



ENVIRONMENT
AGENCY

EC Directive Compliance

KEY

- Area boundary
- Watercourse
- - - Culverted watercourse
- Canal
- Built up area
- Discharge with consent condition for List 1 Dangerous Substance
- River monitoring point for List I Dangerous Substance
- River monitoring point for List II Dangerous Substance
- Abstraction for the purpose of Surface Water Abstraction Directive
- Freshwater Fish Directive - salmonid fishery



0 10km

**Croal/Irwell
Local Environment Agency Plan
Map 8**



**ENVIRONMENT
AGENCY**



0 10km

Effluent Disposal

KEY

- Area boundary
- Main river
- Minor river
- - - - - Culverted river
- Canal
- Built up area
- Sewer overflows (storm and emergency)
- Non-NWW STW
- ▲ Trade effluent discharge

NWW Ltd. STW:

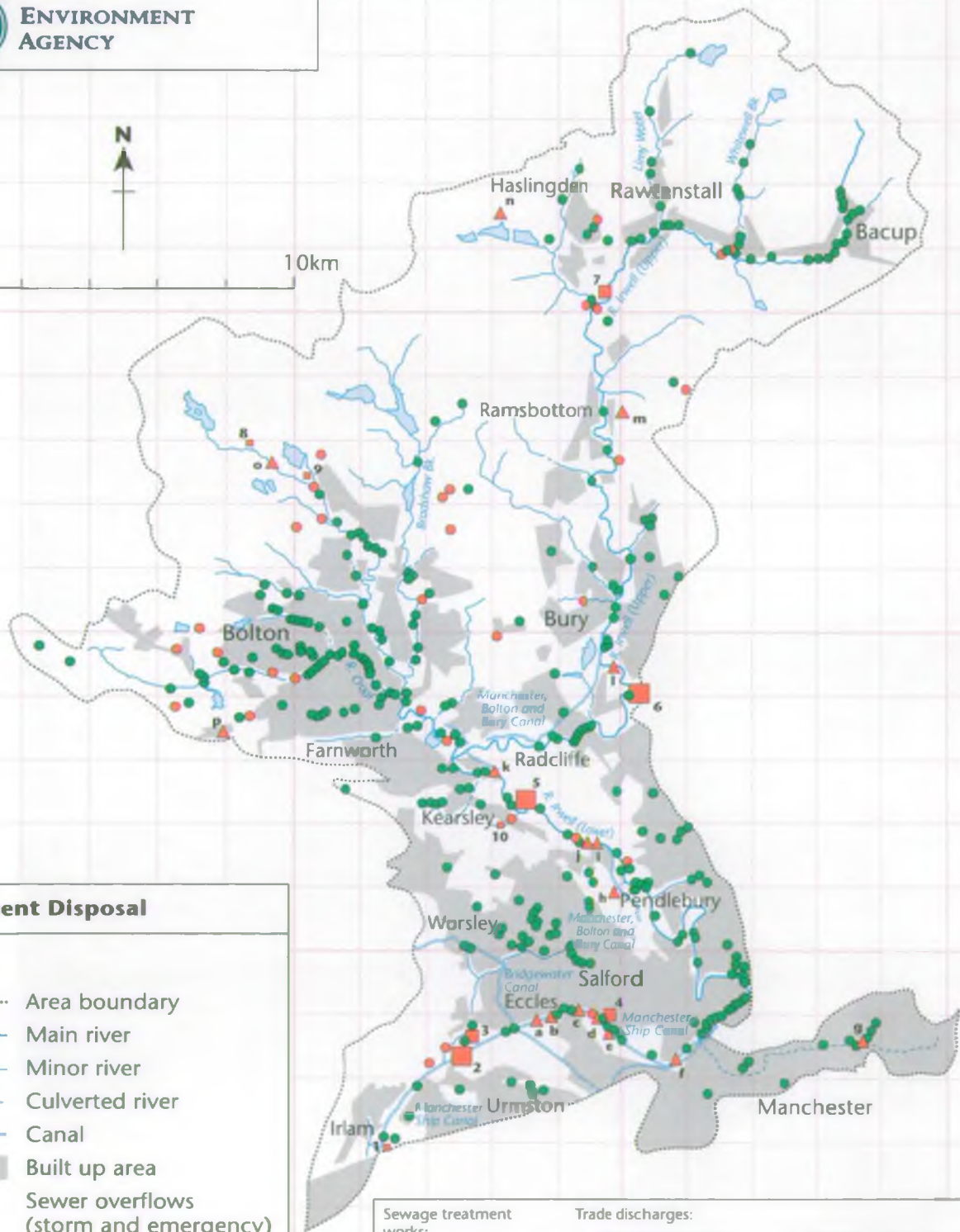
- Small (DWF < 10MI/d)
- Medium (DWF > 10MI/d)
- Large (DWF > 50MI/d)

Sewage treatment works:

- 1 Urmston
- 2 Davyhulme
- 3 Eccles
- 4 Salford
- 5 Bolton
- 6 Bury
- 7 Rossendale
- 8 Belmont
- 9 Longworth
- 10 Hulton Lane Ends

Trade discharges:

- a Houghton Vaughan & Co Ltd
- b Cerestar (UK) Ltd
- c Proctor and Gamble
- d Robert Wiseman Dairies Ltd
- e ESSO
- f Colgate Palmolive
- g Rolls Royce Ltd
- h MEL Chemicals
- i Chloride Industrial Batteries
- j Pilkington Tile Ltd
- k R. Fletcher & Son Ltd
- l Kemira Coatings
- m Marshalls Mono
- n Bardon Roadstone
- o Charles Turner & Co Ltd
- p NCB Garnet Opencast Site



1.4 Effluent Disposal

General

This use relates to the disposal of domestic and industrial effluents to the river system. Discharges to controlled waters require Consents from the Environment Agency, or if they relate to a prescribed process they will be covered by an Integrated Pollution Control (IPC) Authorisation.

Continuous Effluents

Fully treated effluents such as those from Wastewater Treatment Works (WwTW) and trade effluent treatment plants are continuous effluents.

The more significant WwTWs are operated by water companies, in this case North West Water Limited (NWW Ltd). WwTW may receive both domestic and industrial waste. The main works are Bolton, Bury and Rossendale which discharge to the Irwell, Salford, Eccles, Urmston, and Davyhulme discharge to the Manchester Ship Canal, and Belmont goes to Eagley Brook. There are smaller works within the area operated by NWW Ltd, such as Hulton Lane Ends. Houses and other premises which are not on the sewerage network may have a private sewage treatment facility.

The organic load from WwTWs has an impact on the watercourses in the area and in many cases, this can cause the failure to achieve the River Quality Objectives (RQOs) set for the stretch of water. In times of dry weather the volume discharged from some of the larger works makes up a major part of the river flow. In order to meet the RQOs, WwTWs causing such failures will require additional expenditure for improvements.

Many works have an aesthetic impact as the discharge may be discoloured or foaming. These problems are often due to a particular type of trade effluent going to the treatment works. Resolution of the problem may be down to actions taken at source by the trader rather than additional treatment at the WwTWs.

In addition the discharges contain nutrients, such as nitrates and phosphates which lead to the enrichment of the water. Excessive weed and algal growth, variations in the dissolved oxygen levels on a daily basis and a decrease in the diversity of fish and invertebrates are all indicative of eutrophication. Watercourses which show these symptoms and receive a discharge from a Wastewater Treatment Works (serving a population equivalent of greater than 10,000) are put forward as candidates for designation as sensitive waters.

In the last few years NWW Ltd has invested in the improvement of a number of works, particularly the largest in the region at Davyhulme. The extensions to Davyhulme including the 'Biostyr' plant should see the improvement of 17.9km of the Manchester Ship Canal. In turn, this will benefit the quality of the River Mersey through Warrington and the Upper Mersey Estuary.

1.4 Effluent Disposal

Trade Effluents

Functions such as growth, reproduction, metabolic changes and the working of various organs in animals and humans are controlled by hormones. Man made and naturally occurring substances can mimic the effect of hormones while others can disrupt the normal hormonal processes.

Studies have indicated that hormonal changes in fish can be linked to discharges from WwTWs with effluents that contain substances used in the chemical industry, agricultural waste (including pesticides) and textile manufacturing. Nonyl and Octyl Phenols and non-ionic detergents are implicated.

Eccles WwTWs, which discharges to Saltey Brook a tributary of the Manchester Ship Canal, receives a trade effluent containing Alkyl Phenol Ethoxylates (APES) an alkylphenol - based detergent known to have endocrine-disrupting properties. The company, Akcros, has an Environment Agency Authorisation which sets levels on the concentrations used, and so looks to controlling the levels at source, rather than through Eccles Treatment Works.

An environmental quality standard has been proposed by the Agency for nonyl phenols, (1 microgram per litre annual average in watercourses).

Some industries in the area have their own treatment plants. Most of the larger industrial discharges are to the Lower Irwell and to the Manchester Ship Canal. It has been our policy to encourage industry to discharge to sewer. There are 18 main industrial discharges in the LEAP, these include process waters, cooling waters and quarry drainage.

Intermittent Effluents

Intermittent effluents include storm overflows on the sewerage network, emergency overflows, storm drains and surface water run-off. Of these the storm overflows are the most significant in terms of impact on water quality. There are approximately 400 overflows from the sewerage network, the majority of them are Combined Sewer Overflows, (CSOs) but there are a number of emergency overflows from pumping stations. This number changes as improvement work on the sewerage system is carried out and new overflows are built and older ones abandoned or rebuilt.

The organic impact from overflows can result in the failure of the watercourse achieving the River Quality Objectives. There may also be a visual impact, poor aesthetics, caused by sewage solids and litter, such as condoms and sanitary towels.

Although these discharges occur sporadically they can have an impact on aquatic populations. The sudden increase in the biochemical oxygen demand and ammonia concentration, resulting in a drop in the oxygen levels can be fatal to fish and invertebrates. In some cases the chemical monitoring of a stream does not reveal the true effect of CSO discharges in terms of RQO compliance. A more accurate indicator is the impact of the overflows on the aquatic

1.4 Effluent Disposal

ecosystem. In recognition of this the Urban Pollution Management (UPM) procedures have been introduced. The UPM procedures set standards for the assessment of overflows and develop solutions.

Contamination of the surface water drains through wrong connections has a more localised impact, but is a problem throughout the area and can be both difficult and time consuming to trace.

Asset Management Plans

The Asset Management Plan (AMP) is the Water Service Company's programme of expenditure and investment for ten year periods.

The Environment Agency is involved in setting priorities for work necessary for environmental improvements. At present we are involved in the second plan, AMP2, for the years 1995 to 2005. The first five years of the programme, 1995 to 2000, has been confirmed. Although schemes have been identified for the second five year period, up to 2005, they are still open to negotiation, and changes in priority, according to what are deemed to be the most environmentally beneficial projects. The Agency are at present negotiating with North West water on projects for Asset Management Plan 3 (AMP3), which will follow on from the year 2005.

The schemes put forward are assessed on the actual and potential environmental benefits that would occur following improvements in water quality. The Environmental Benefit Assessments on the AMP 3 submissions consider factors such as habitat, water uses for potable and industrial abstractions, and water based activities like angling, boating and canoeing. Comments from the public, Local Authorities, industry, fishing and canoeing clubs can also help in the decision making.

1.5 Hydrology

General

The average annual rainfall for the plan area, as shown in map 9, varies from 850mm near Manchester to over 1500mm north of Bolton. This variation is caused by the orographic effect (maritime air masses that cool when obliged to rise over mountains in their path, causing rainfall) of the hills north of Bolton, especially during south westerly rainfall events.

Daily rainfall is measured using voluntary observers via a network of twenty-one rainfall sites. As part of this network five of the sites record at sub-daily intervals from which rainfall intensity can be determined, three of the sites have telemetry units which allow data to be retrieved on a daily basis. These gauges form part of the Agency's national rainfall measurement network.

River levels and flows are measured at various points throughout the plan areas. The location of these hydrometric stations are given on map 10.

The pattern of rainfall throughout the year is shown in Figure 1 for the raingauges at Davyhulme WwTW, Urmston (NGR SJ756962) and Springs Reservoir (NGR SD690143). The highest and lowest monthly recorded totals are also given to illustrate the range of monthly totals that can be expected.

Figure 1 Seasonal Variation in Rainfall

Davyhulme WWTW (NGR SJ756962) 1961-90 Long Term Average: 858 mm/yr												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mean*	75	56	64	54	60	69	64	81	79	87	87	82
Max+	150	147	168	111	124	150	133	152	172	167	166	220
Min+	7.9	2.9	9.7	4.9	5.5	21	10	6.2	17	28	43	12
Springs Reservoir (NGR SD690143) 1961-90 Long Term Average: 1554 mm/yr												
Mean*	153	96	121	91	96	111	112	143	144	165	158	164
Max+	253	221	286	173	189	189	245	269	264	366	258	335
Min+	7.9	9.4	29	4.6	12	28	25	22	42	51	76	48

* 1961-90 Long Term Average. + Maximum and Minimum Recorded Monthly Totals 1961-96.

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

**Croal/Irwell
Local Environment Agency Plan
Map 9**



**ENVIRONMENT
AGENCY**

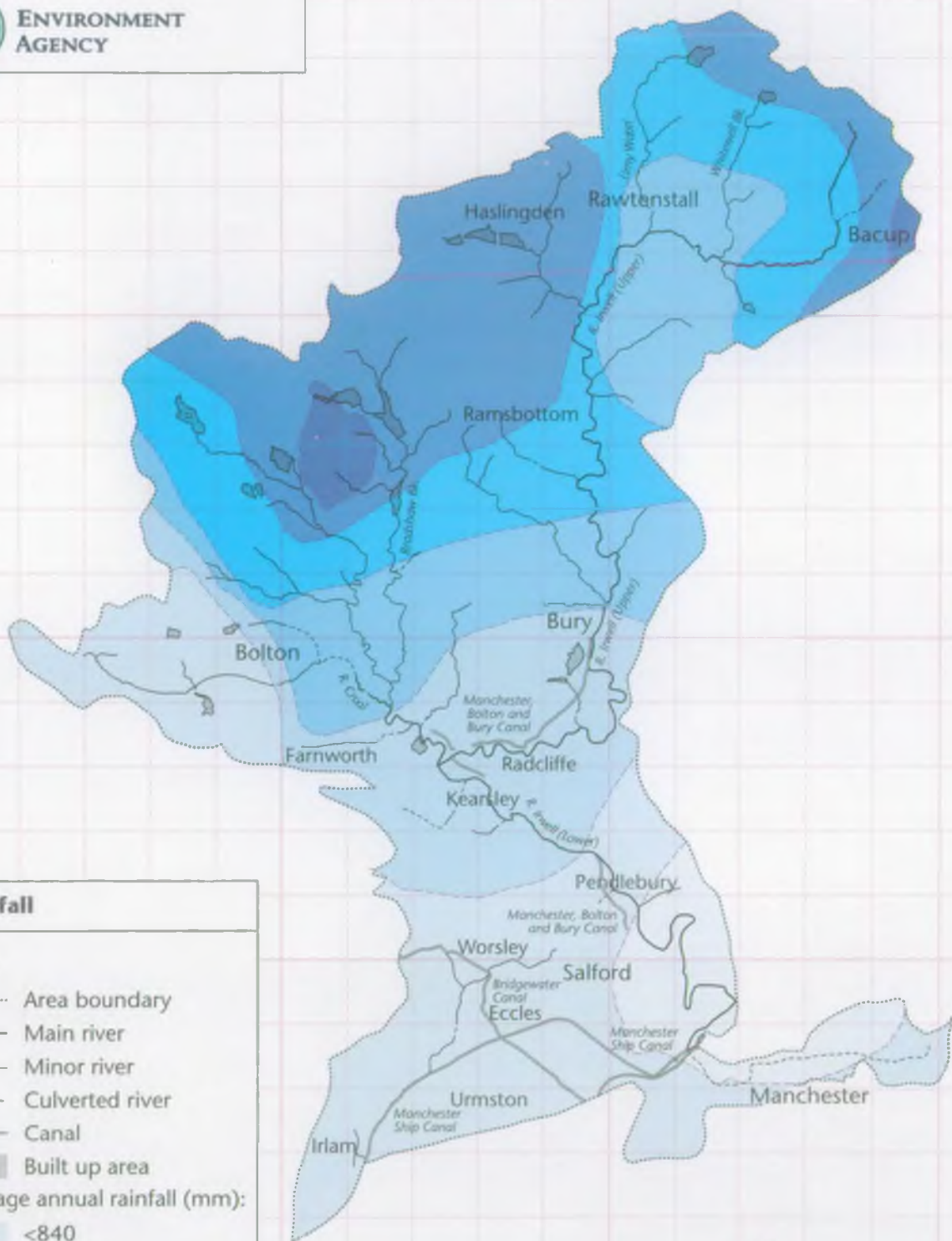
Rainfall

KEY

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

Average annual rainfall (mm):

- <840
- 840 - 960
- 960 - 1080
- 1080 - 1200
- 1200 - 1320
- 1320 - 1440
- >1440

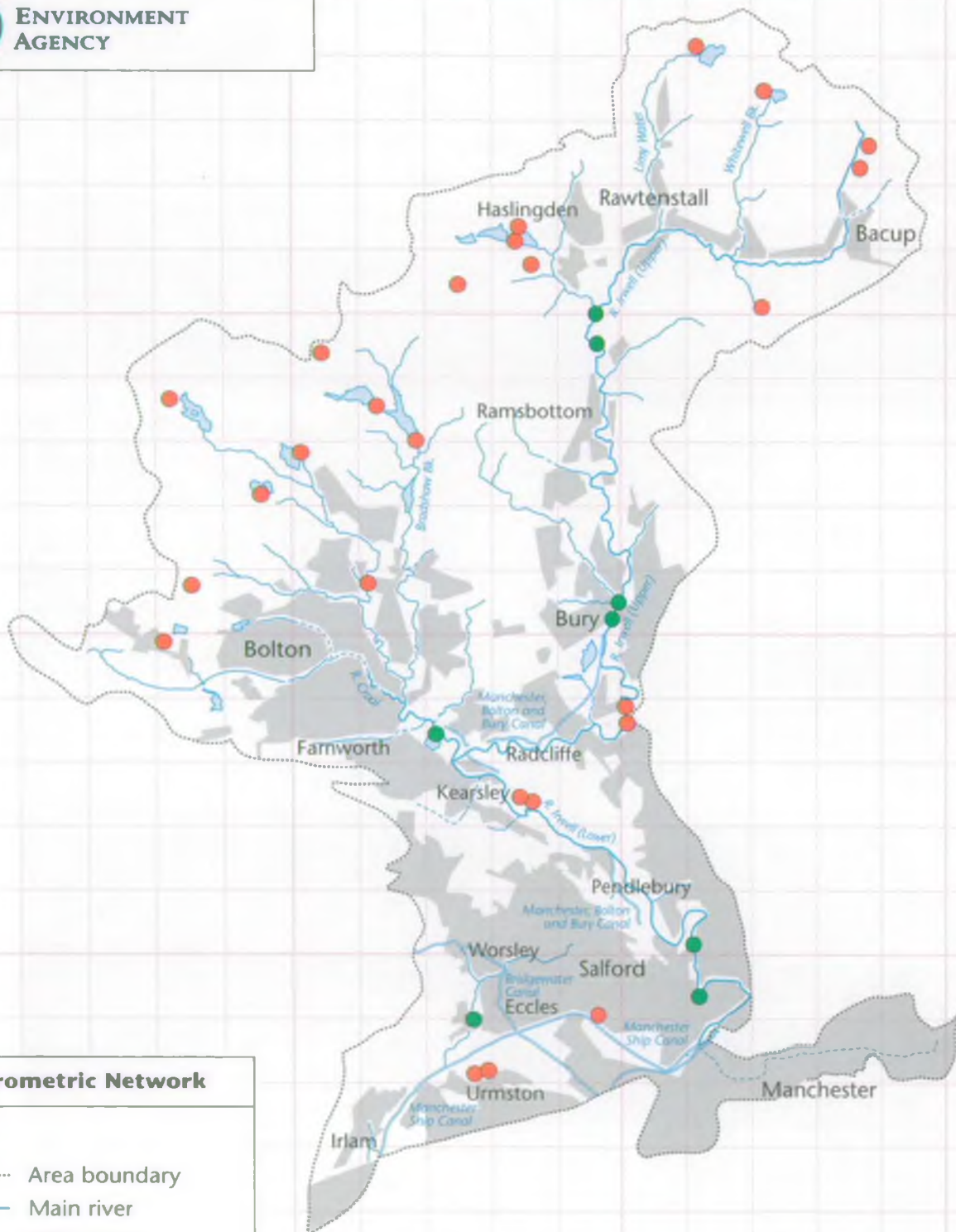


0 10km

**Croal/Irwell
Local Environment Agency Plan
Map 10**



**ENVIRONMENT
AGENCY**



Hydrometric Network

KEY

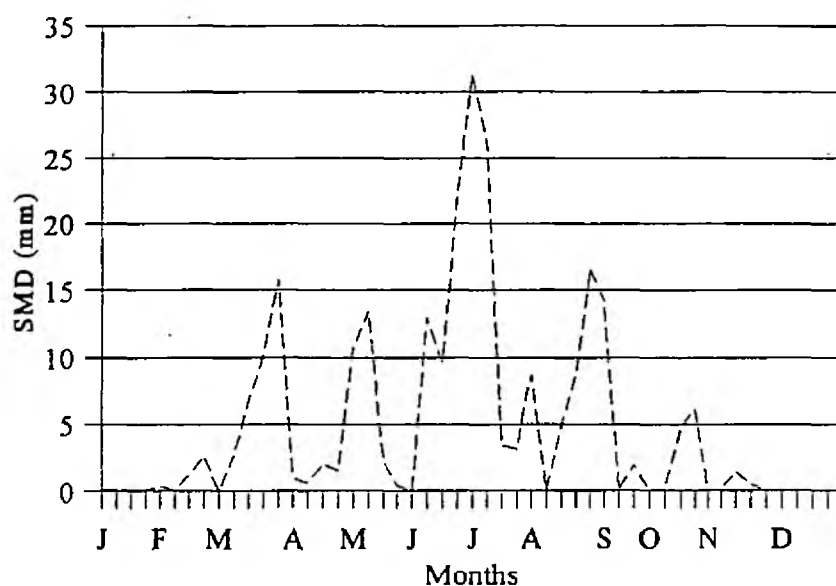
- Area boundary
- Main river
- - - Minor river
- . - Culverted river
- Canal
- Built up area
- Rain gauge location
- River level and flow measurement station



0 10km

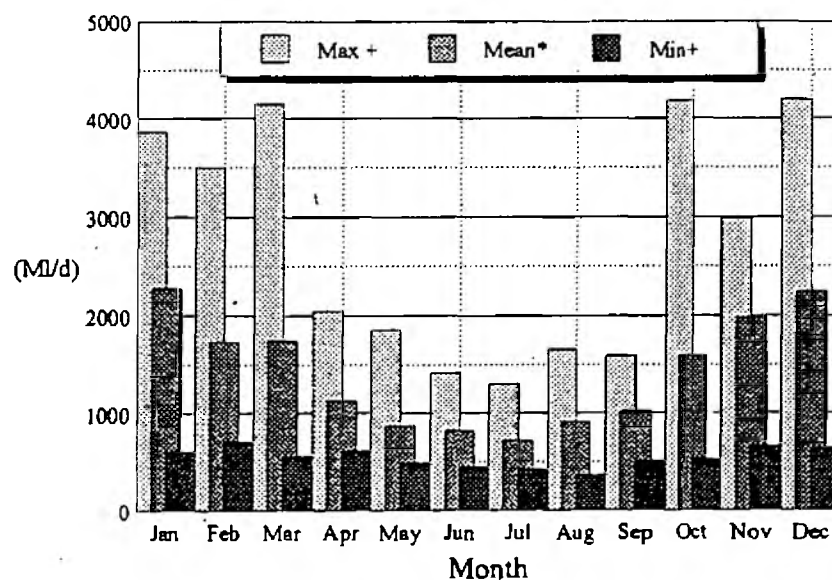
1.5 Hydrology

Figure 2 Typical Soil Moisture Deficit (1993)



Rainfall, SMD and groundwater levels contribute to the natural variability of the flow in a river. This seasonal variability is demonstrated by Figure 3 which shows the flows in the river Irwell measured at Adelphi Weir gauging station in Salford (NGR SJ8242 9874).

Figure 3 Monthly Mean Flow (ML/d) in the River Irwell at Adelphi Weir



1.6 Hydrogeology

General

The majority of the area, within the Croal catchment and upper reaches of the Irwell, is underlain by rocks of Carboniferous age (Coal Measures and Millstone Grit Series), comprising alternating sandstones, shales/mudstones and, in the case of the Coal Measures, occasional coal seams. Further south, the Irwell passes onto younger Permo-Triassic rocks. These comprise sandstones (the Collyhurst and Sherwood Sandstones) separated by a relatively thin layer of mudstone (the Manchester Marl). These strata have been displaced by a number of north-west/south easterly trending faults.

Except on the higher ground in the north, the solid rocks are mostly covered by glacial deposits, comprising 'boulder clay' or till and sands and gravels. Alluvium flanks the main watercourses. Peat bodies have developed locally, both on the hill tops and on low lying ground, for example Chat Moss in the south west.

The Carboniferous sandstones tend to act as individual 'minor aquifers' separated by the lower permeability shales/mudstones. Groundwater is generally by fissure flow. The presence of old coal workings within the Coal Measures (Westphalian) can give rise to complex and rapid groundwater flow and can adversely affect water quality.

In contrast, the Permo-Triassic sandstones form part of a 'major aquifer' which extends from Macclesfield up to Manchester and westwards across to Merseyside. However, again the hydrogeology is complicated by the presence of the low permeability Manchester Marls, combined with displacement by faulting. Poor quality (old saline) groundwater is present at depth in and around Trafford Park. (See issue 1 of the Croal/Irwell LEAP Consultation Report).

Where present glacial clay will restrict rainfall recharge to any underlying aquifers. It will also provide some protection against pollution from surface activities. In contrast, the more permeable sands and gravel deposits can act as minor aquifers in their own right, as well as providing potential pathways for recharge and contamination. They may allow leakage from or groundwater discharge into surface watercourses which flow over them.

**Croal/Irwell
Local Environment Agency Plan
Map 11**



**ENVIRONMENT
AGENCY**

**Summary Geological Map:
Geology at Surface (simplified)**

KEY

- Area boundary
- Main river
- Minor river
- - - Culverted river
- Canal
- Built up area
- Peat at surface
- Sandy drift at surface
- Clayey drift at surface
- pt Permo-Triassic strata
- Exposed Carboniferous Coal Measures (Westphalian) strata
- Exposed Carboniferous Millstone Grit series (Namurian)
- ms Millstone Grit series

DRIFT
SOLID



0 10km

**Croal/Irwell
Local Environment Agency Plan
Map 12**

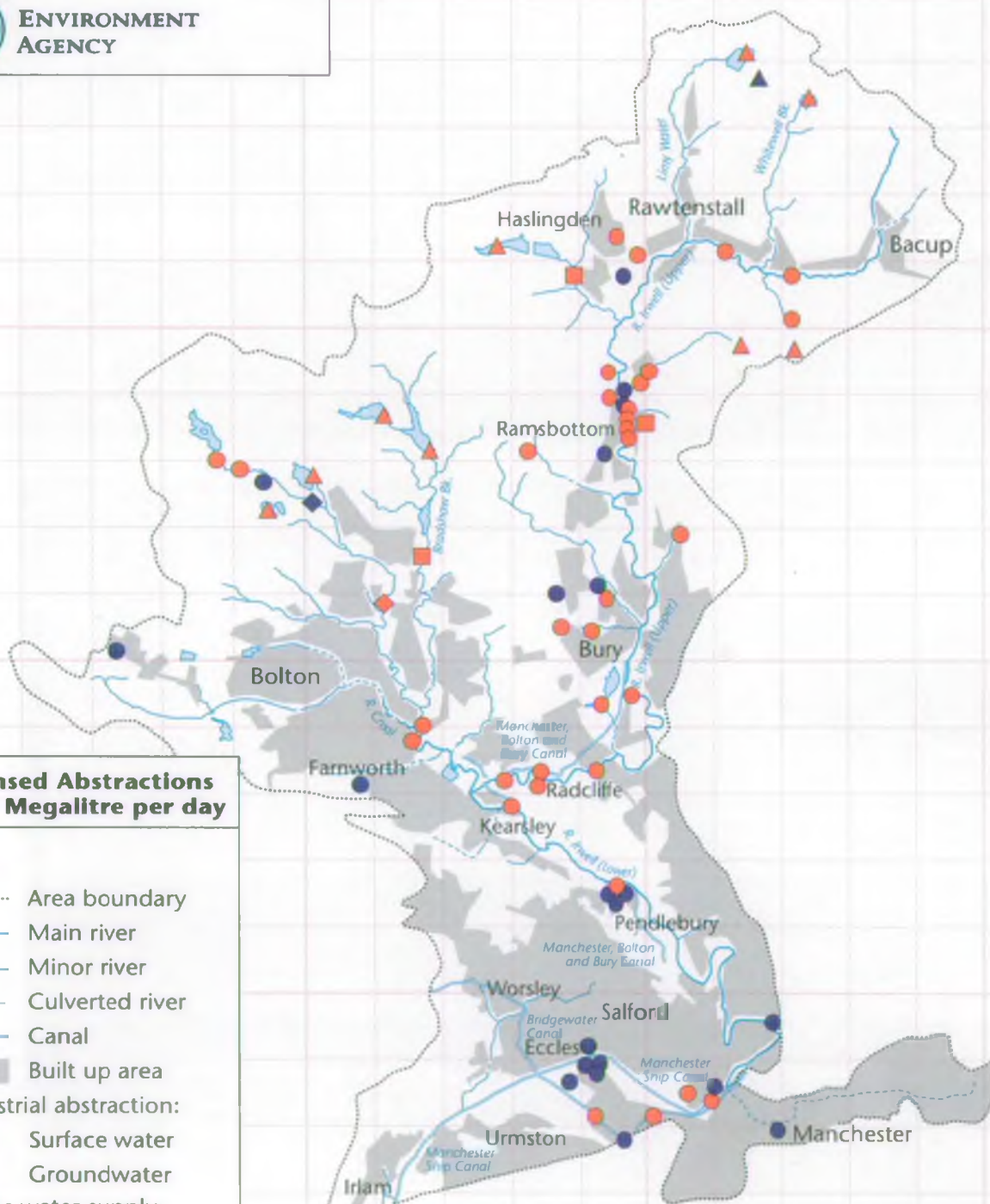


**ENVIRONMENT
AGENCY**

**Licensed Abstractions
>0.5 Megalitre per day**

KEY

- Area boundary
- Main river
- Minor river
- - - Culverted river
- Canal
- Built up area
- Industrial abstraction:**
 - Surface water
 - Groundwater
- Public water supply:**
 - ▲ Surface water
 - ▲ Groundwater
- Amenity:**
 - Surface water
 - Groundwater
- Other abstractions:**
 - ◆ Surface water
 - ◆ Groundwater



0 10km

1.7 Water Abstraction - Surface and Groundwater

General

The 1995 Environment Act gives the Environment Agency the statutory duties and responsibilities relating to the planning and management of water resources.

It is specifically responsible for licensing, and enforcing, abstractions made from water held in natural underground storage and from all surface waters above the tidal low water mark. The responsibility for public water supply in the LEAP area lies with North West Water Ltd.

To support the Agency in carrying out its water resource management function it is essential to collect quantitative data on the various aspects of the hydrological cycle. Water resources staff routinely monitor rainfall quantity and intensity, surface water level, river flow and groundwater levels.

The Agency also has a consultee role regarding applications for planning permission. This means that the Agency's views and advice are given on applications which can affect the demand for, or quality of, water resources.

The Agency's water resources activities are also influenced by certain EC directives which have a bearing on the quality of water resources for public water supply and other purposes.

Surface Water Usage

There are more than 200 licensed abstractions in this LEAP area. Of these, almost 80% are within the Irwell catchment. The head waters of both the Croal and Irwell are extensively reservoirised and these are used for public water supply purposes. These include Clough Bottom, Clowbridge, Holden Wood Group, Scout Moor, Cowpe, Entwistle, Wayoh, Delph, Springs and Dingle. Hydrology is used to optimise reservoir use by modelling reservoir refill characteristics, drawing largely on long term rainfall needs. Water for public water supply can also be imported from outside the catchment. During the drought of 1995-96, the compensation water discharges were reduced from some of these reservoirs through the granting of Drought Orders and Drought Permits in order to preserve stocks.

More than 50% of the licences in the catchment authorise abstraction for industrial use. Of these, many rely on surface water sources to provide supplies for process and manufacturing use within many traditional industries such as textiles and paper making.

There are many sources in the upper reaches of the catchment used for private water supplies and agricultural use, most of which are exempt from licensing requirements.

The distribution of the major licences (greater than 0.5 ml/d) are shown in Map 12.

1.7 Water Abstraction - Surface and Groundwater

Groundwater Usage

The Permo-Triassic sandstones are exploited for industrial purposes within the catchment; in

Trafford Park there has been a history of heavy groundwater abstraction, in excess of the natural rate of replenishment. This has resulted in quality problems, (Please refer to Issue 1 of the Croal/Irwell LEAP Consultation Report).

There is limited groundwater abstraction from the Carboniferous Coal Measures (Westphalian) strata in the area; yields are difficult to predict and the quality usually poor (with high iron contents). The sandstone layers within the Millstone Grit Series (Namurian) tend to act as individual 'minor aquifers' separated by the lower permeability shales/mudstones. Groundwater is generally by fissure flow. They are capable of supporting small scale agricultural and domestic supplies and may be used for such in areas remote from the public mains water system.

Groundwater Protection

The Policy and Practice for the Protection of Groundwater encompasses two principal initiatives: definition of Groundwater Protection Zones (GPZs) around major abstractions and national mapping of groundwater vulnerability at 1:100,000 scale.

Groundwater Protection Zones have been defined for the public water supply sources within the catchment. For smaller or none potable groundwater sources, catchment protection needs to be considered on a case by case basis.

The Croal and Irwell catchments are covered by four Groundwater Vulnerability Maps, Sheets 10, 11, 16 and 17, available from Her Majesties Stationary Office (HMSO).

1.8 Area Drainage

General

One of the corporate aims of the Environment Agency is to provide effective defence for people and property from rivers and the sea and to provide adequate arrangements for flood forecasting and warning.

The Nature of Flooding

Rivers and watercourses can transfer only a limited quantity of water and flooding occurs when the river's carrying capacity is exceeded. Flooding can be caused by extreme weather or problems associated with the river channel itself.

Watercourses of a similar nature can, however, respond differently to the same rainfall conditions due to variations in area and land use. Localised flooding may also occur where watercourses become blocked at particular points such as bridges or inside culverts. Often the debris, which may include garden waste and other rubbish deposited on river banks, gathers at these points which can be a major problem in urban areas. There is also a potential for flooding where either surface water drainage capacity is exceeded or drains are unable to discharge because of high water levels in the river.

When watercourses flood, water flows onto a floodplain. These natural floodplains, (which are as much a part of the river system as the channel that carries normal flows), provide extra capacity for the storage and continuation of flood water. This additional capacity is reduced if significant areas of floodplain are raised, embanked or built upon. The loss of storage volume can lead to higher river levels and consequently it becomes impossible to alleviate flooding in all areas. The priority for flood alleviation lies in urban areas as rural undeveloped floodplains should be allowed to maintain their natural role.

The Local River System

The primary rivers within the LEAP area are the Croal, Upper Irwell and Lower Irwell.

Description of Local River Drainage System

The headwaters of the River Croal rise on Darwen Moor to the north-west of Bolton. It flows in a general south-easterly direction to join the River Irwell between Bolton and Kearsley. Its main tributaries are the River Tonge, Eagley Brook, Bradshaw Brook and Middle Brook.

The Upper Irwell is that part of the Irwell system from its headwaters to the confluence with the River Croal. It rises on Deerplay Moor, near Bacup and flows in a southerly direction before turning west near Bacup and then returning to a southerly direction near Rawtenstall, continuing through Ramsbottom and Bury and turning west through part of Radcliffe. Its main tributaries are Limy Water, Kirklees Brook, the River Ogden and Whitewell Brook.

The Lower Irwell is that part of the River Irwell between the confluence of the Upper Irwell

1.8 Area Drainage

and the River Croal downstream to the River Mersey/Manchester Ship Canal confluence. It flows in a general south-easterly direction through Kearsley, Pendlebury and Salford. The catchment area includes several small, mainly culverted streams draining Central Manchester and Salford and also Worsley Brook.

Historical Background

With the exception of the northern moorland fringes, this LEAP area comprises dense urban areas of the Greater Manchester conurbation. This development occurred mainly through the nineteenth and early twentieth centuries following the advent of the industrial revolution. During this period society placed little value on the environment, the river being an asset which was exploited by industry and marginalised within the urban landscape.

This legacy is evident in this LEAP area where rivers pass through the urban areas. In these locations there is little remaining of the natural corridor as the river channel has been extensively modified by walls, which are often integral with adjoining buildings, or replaced by culverts. Many of these river walls, culverts and adjoining buildings have not been adequately maintained, are unsightly, provide substandard levels of flood protection and could contribute to a significant maintenance liability.

Throughout the LEAP area there are numerous lengths which have these characteristics. Long lengths of culvert exist on the River Croal, Middle Brook and Captains Clough Brook where they pass through Bolton town centre. Elsewhere there are old mill buildings adjoining the watercourses together with associated bridges, culverts, river walls, dwellings, millraces and mill reservoirs, many of which are in a derelict condition.

Flood Defence Framework

In undertaking its flood defence and land drainage functions the Environment Agency operates within duties conferred by legislation. The legislation imposes a basic duty on the Agency to "exercise a general supervision over all matters relating to flood defence". The degree of supervision which the Agency exercises over a particular watercourse depends on whether it is classified as "Main River" or "Ordinary Watercourse".

In discharging its functions, the Environment Agency is concerned with the natural catchment area of watercourses and rivers and excludes surface water drainage systems of development areas other than their effect on the natural system in terms of storage, discharge and outfall requirements.

Main River

Whilst Main Rivers are generally the significant watercourses within a catchment, the distinction between ordinary watercourses is for administrative purposes to identify those lengths of watercourse where the Agency has specific powers. The common law obligations and statutory responsibilities of riparian owners are unaffected by the distinction.

**Croal/Irwell
Local Environment Agency Plan
Map 13**



**ENVIRONMENT
AGENCY**

**Flood Defence: River
Network**

KEY

- Area boundary
- Main river
- Ordinary watercourse
- Culverted section
- Canal
- Built up area



0 10km

1.8 Area Drainage

Any works in, over or within 8 metres of the bank top of a Main River requires the consent of the Agency. The Agency also has permissive powers to undertake flood defence works on Main Rivers. Local Authorities have certain statutory powers and duties relating to ordinary watercourses.

The Agency may propose to change the status of a watercourse from "ordinary" to "main" if there are land drainage or flood defence problems associated with the watercourse which require the use of permissive powers to be addressed successfully. The final decision on whether a length of watercourse is "mained" rests with the Ministry of Agriculture, Fisheries and Food (MAFF). This is only taken after a period of consultation, including advertisement.

The Main Rivers within the LEAP area are identified on Map 13.

Flood Defence Activities

The Agency fulfils its duty of general supervision of flood defence matters by operating in the following distinct areas;

- (i) Maintenance activities on "Main River" watercourses and flood defence structures.
- (ii) Construction of new or improvement of existing flood defences.
- (iii) Development Control through liaison with Local Planning Authorities, consultation on Planning Applications and through consideration of applications for Land Drainage Consent.
- (iv) Provision and operation of Flood Warning systems.

These areas are considered separately below.

In carrying out these flood defence activities, the Agency looks to protect and enhance the environment by ensuring that all works are undertaken, as far as possible, in an environmentally sensitive manner with the minimum adverse environmental impact. The Agency attempts to enhance the river habitat diversity wherever practicable and identify opportunities for the enhancement of recreational and amenity facilities.

It is often necessary to balance the need to protect people and property from flooding with the environmental impact of undertaking works in a watercourse. In particular the Agency has to consider the impact on natural features, protection of features of historic interest and the conservation and enhancement of wildlife. Through consultation with internal conservation staff, local and national environmental organisations and the local public, the Agency seeks to achieve this balance before commencement of flood defence works.

1.8 Area Drainage

Maintenance Activities

Due to the processes of erosion and sediment deposition watercourses are a variable feature in the landscape. The resulting change in position and shape of river channels is, however, inconsistent with maintaining existing standards of flood protection to adjoining urban development.

In utilising areas of the natural floodplain for development in the past, levels adjacent to the channel were increased and the natural river channel was replaced or supplemented by walls and culverts, and water flows and levels regulated by the provision of sluices and weirs. Consequently the land drainage system, where it passes through older developed areas, has tended to become an artificial system which requires continual maintenance to function effectively at times of high flow and so maintain the existing standards of flood protection.

Large lengths of watercourse within this LEAP area exhibit these characteristics and therefore maintenance works are necessary to prevent the major areas of development on the natural floodplain from becoming increasingly susceptible to flooding.

Maintenance Strategy

Whilst the ultimate responsibility for the upkeep of a watercourse rests with the riparian owner, the Agency has permissive powers to perform maintenance works within and adjoining the watercourse. These powers are exercised according to the availability of resources and the assessed priorities.

The maintenance works undertaken include routine, reactive and emergency works. Planned maintenance is assessed to ensure that the available resources are directed to best effect for the region as a whole.

Physical Features within the LEAP Area

Maintenance works undertaken include vegetation control, repairs to earth floodbanks and other flood protection structures, dredging and the removal of blockages from culverts, channels and debris screens. The maintenance requirements of a watercourse are dependent on the extent of modification and the presence of structures and adjoining properties. The number of debris screens, weirs and culverts longer than 30 metres within the LEAP area are summarised in the table below.

1.8 Area Drainage

Table 5 Physical Features Within the LEAP Area

Sub-catchment	Area (km ²)	Main River Length (km)	No. of Culverts (>30m length)	Total length of Culverts(km) (>30m length)	No. of Weirs	No. of Debris Screens
River Croal	148	69.59	37	6.49	72	17
Upper Irwell	186	91.91	57	8.48	159	4
Lower Irwell	134	28.88	5	0.65	6	7
Total	468	190.38	99	15.62	237	28

Maintenance Expenditure Within the LEAP Area

In 1996/97 maintenance expenditure within the LEAP area was as detailed in the table below.

Table 6 Distribution of Maintenance Expenditure

Catchment	Main River Length (km)	Maintenance Expenditure 1996/97 (£k)	Maintenance Expenditure per main river length (£k/km)
N.W.Region - South Area	2073.6	3,600	1.74
River Croal	69.59	105	1.51
Upper Irwell	91.91	155	1.69
Lower Irwell	28.88	45	1.56
Total in LEAP Area	190.38	305	1.6

Emergency Maintenance

At times of heavy rainfall the operational priorities are to clear debris and identified obstructions where possible, patrol defences and carry out any emergency repairs as required.

During these emergency situations Local Authorities and the fire service may also provide assistance.

1.8 Area Drainage

Maintenance Problems

The following represent particular maintenance problems within the LEAP area;

- Illegal tipping into and adjacent to the watercourse
- Access into the watercourse to undertake maintenance works
- Channel blockages caused by collapsing river walls
- Need for routine dredging in man-made channels
- Prevention of blockages within culverts

Flood Defence Improvements

As part of the general supervision of watercourses, the Agency records incidents of actual flooding which will then be investigated to try and identify the reasons for the flooding and what, if anything, can be done to alleviate it. The Agency will consider using its permissive powers to promote improvements only if the proposed works are economically justified and technically and environmentally feasible.

Appraisal of Proposed Flood Defence Improvements

Improvements to flood defences will only be considered where the predicted existing standard of protection against flooding is less than the "indicative standard" for the land use type as determined by the Ministry of Agriculture, Fisheries and Food. For the "high density urban" and "medium density urban" land use, which is typical of much of this LEAP area, the indicative standards of protection against anticipated flooding are 1 in 100 and 1 in 75 years respectively. The river corridor land use types within the LEAP area are indicated on Map 14.

To be considered economically justified, the improvement project must cost less than the benefits which accrue to society generally in terms of prevented flood damages. In assessing the benefits a financial value is allocated to certain features such as type of property (residential, retail, office or manufacturing), land use, traffic disruptions and emergency services.

For the project to proceed, construction must also be possible in an environmentally sensitive manner compatible with the need to protect life and property from the risk of flooding.

Flood Defence Capital Programme

Following the initial investigation into a known flooding problem a preliminary scheme is assessed and, if justified, entered into the Capital Programme and a feasibility study

The map displays the River Mersey and its extensive network of tributaries across Greater Manchester. Key features include:

- Major Towns and Cities:** Bolton, Bury, Farnworth, Radcliffe, Kearsley, Pendlebury, Worsley, Eccles, Salford, Urmston, Manchester, Bacup, Haslingden, Ramsbottom, and Rawtenstall.
- Reservoirs:** Numerous reservoirs are marked, such as Belmont, Dingles, Springs, Gate, Easley, Delph, Turton & Entwistle, Worsley, Clough Bottom, Clough, and many others.
- Canals:** The Manchester, Bolton and Bury Canal and the Bridgewater Canal are shown.
- Legend:**
 - Area boundary (dotted line)
 - Main river (thick blue line)
 - Ordinary watercourse (thin blue line)

KEY

-

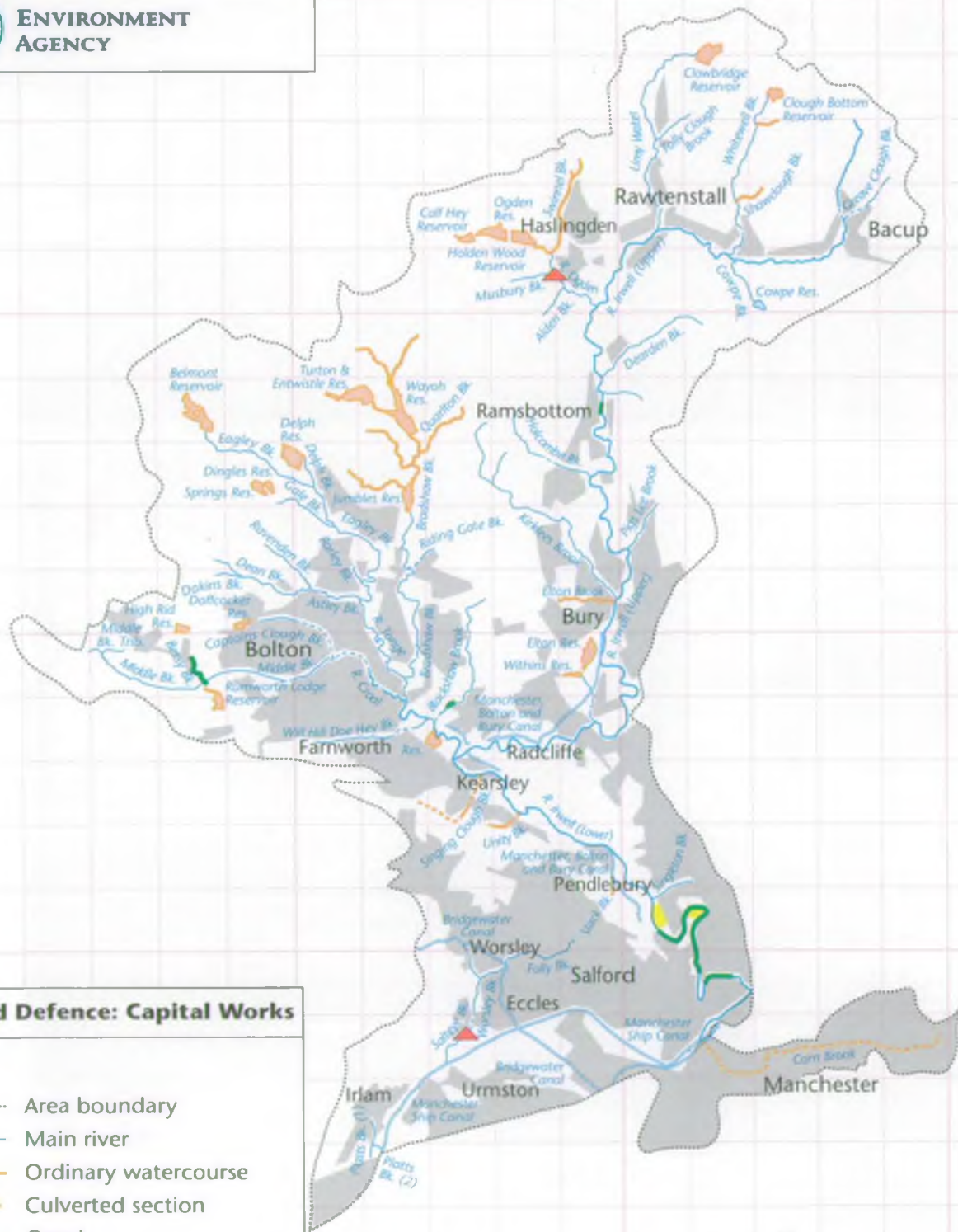
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10km

**Croal/Irwell
Local Environment Agency Plan
Map 15**



**ENVIRONMENT
AGENCY**



Flood Defence: Capital Works

KEY

- Area boundary
- Main river
- Ordinary watercourse
- Culverted section
- Canal
- Built up area
- ▲ Construct access ramp for maintenance works
- Improvement works
- Proposed site for flood basins

1.8 Area Drainage

undertaken to develop the options. The assessment of these options against the above criteria will determine whether a project proceeds to the design and construction stages.

Within the LEAP area there is currently one project which has progressed to the feasibility study stage. This is on the River Irwell at Ramsbottom and is currently programmed for construction in 2001-2.

The Agency is also carrying out a multi-million pound scheme to improve the standard of flood protection at Salford on the Lower Irwell. This heavily populated area has had a history of flooding with floods this century in 1946, 1954, 1980 and as recently as 1995. The floods of 1946 were the worst this century and affected 5000 homes and 300 business premises. This new scheme will involve storing excess flood water temporarily in a controlled manner and releasing it once river levels have subsided. When not used for flood storage the open areas will be used for sport and recreation. The works will also include improvements to the river channel and the construction of flood walls and an embankment.

Development Control and Land Drainage Consents

The Agency takes an active role in the planning process and liaises closely with Local Planning Authorities. Through this process the Agency seeks to discourage development that may be affected by flooding, would increase the risk of flooding to others, or would impede flood defence works and maintenance. The Agency seeks to establish a close working relationship, based on cooperation rather than simply consultation, to ensure that the Planning Authority makes informed and sound Planning decisions with regard to land drainage and flood defence matters.

Protection of the Flood Plain

In fulfilling the above role the Agency is concerned not only with the watercourse channel during normal flows, but also the river floodplains and washlands which naturally accommodate water during periods of flood.

In protecting the floodplain from inappropriate development the Agency is dependent on the Local Planning Authorities exercising their powers. As a statutory consultee in the Planning process the Agency has the opportunity to influence their decisions. To help in this process the Agency has developed a clear policy on the issue which is detailed, together with guidance, in the document "Policy and Practice for the Protection of Flood plains".

The objectives of the Agency's Floodplain Policy are as follows;

- development should not take place which has an unacceptable risk of flooding, leading to danger to life, damage to property and wasteful expenditure on remedial works.
- development should not create or exacerbate flooding elsewhere.

1.8 Area Drainage

- development should not take place which prejudices possible works to reduce flood risk
- development should not cause unacceptable detriment to the environment.
- natural floodplain areas are retained and where practicable restored in order to fulfil their natural function.

Flood Risk Areas

To assist in the Planning process the Agency, as part of its survey duties, is in the process of producing up to date and consistent maps of flood plains. These maps will indicate which areas are at risk of flooding for a "1 in 100" year flood event, and will be copied to local Planning Authorities to assist them in formulating Local Plans. The locations within the LEAP area which are considered to be at risk of flooding are indicated on Map 16.

Control of Surface Water Discharges

Following the development of a "green field" site the quantity of surface water run-off will usually increase due to the creation of impermeable surfaces such as roads, car parks and roofs. Whilst the impact of an individual development in terms of increasing the flood risk elsewhere is relatively small the cumulative effect can be significant. (This links with Issue 8 of the Croal/Irwell LEAP Consultation Report).

For this reason the Agency, in cooperation with the Local Planning Authority, will seek to ensure that attenuation of the surface water run-off is incorporated into new developments where it is considered necessary.

Land Drainage Consents.

The Agency has powers to control the works of others on or near a watercourse. Any works in, under, over, or within 8 metres of a Main River requires prior consent. On ordinary watercourses consent is required for any culverting or works which could affect the flow.

As well as new construction, works such as alterations and repairs, temporary works, tree planting and mineral extraction all have to be consented. The reason for this is to ensure that any works do not endanger life or property by increasing the risk of flooding or cause harm to the water environment.

Flood Warning

The Agency operates a warning system which enables advance preparations to be made to reduce the impact of flooding. This system utilises information gathered from water level gauges in rivers, rain gauges, weather radar, on-site monitoring and forecasts.

Environment Agency

Flood Defence: Flood Areas

Area boundary

KEY

-

1.8 Area Drainage

Formal Flood Risk Zones

Where it is possible, the Agency has formal agreements with the emergency services and local authorities to warn the public directly of the risk of flooding using the telephone or loudhailers. The Agency also provides information using the Floodcall system and the media. Although flooding to properties may not be prevented, the risk to life and the extent of damage would be reduced.

At present there is one Formal Flood Risk Zone within the LEAP area, at Salford on the Lower Irwell. Further zones will be considered on their individual merits which includes, for example, the ability to provide two hours warning. The zone at Stubbins on the Upper Irwell is presently being investigated as a possible future formal zone.

Informal Flood Risk Zones

At a number of flood risk sites, where no formal warning arrangements are in place, the Agency is able to provide flooding information to local authorities and the emergency services. This information enables these bodies to respond to assist the public.

There are five informal flood risk zones :-

Crow Tree Farm Brook at Radcliffe,
River Irwell at Radcliffe,
Riding Gate Brook at Bradshaw, Bolton,
Whitewell Brook at Rawtenstall,
Blackshaw Brook at Breightmet, Bolton.

1.9 Waste Management

General

Waste is produced by every household, business and industry. The safe handling, treatment and disposal of waste is essential to the health and wellbeing of the environment and the community, and it is the remit of the Agency to ensure that waste does not cause pollution of the environment, harm to health or serious detriment to amenity. It does this by assessing the types and quantities of waste produced, by registering and monitoring the carriage of waste and by licensing and monitoring treatment and disposal of waste.

The key areas of the Agency's role in waste regulation summarised briefly as follows.

Waste Management Licensing

A licensing system for waste management sites was first introduced in 1976, with modifications coming in 1988 and again in 1994. Licences are now required for landfill sites, transfer stations, treatment plants, and processing and storage facilities, including scrap metal yards. The Agency is responsible for issuing and enforcing these licences, and for registering the various activities which are exempt from the need for a licence. Applicants must be 'fit and proper persons' to hold a licence and this depends upon technical competence, financial capability, and any convictions for relevant offences.

An application for a licence, containing details of the proposed operation, must be made in writing to the Agency, who will consider it and seek comments from a range of consultees. Planning permission is also usually required for the development of a waste management facility. Subject to these provisions, and provided the applicant is a fit and proper person, the Agency must issue a licence unless it is satisfied that rejection is necessary in order to prevent pollution of the environment, harm to human health, or in certain cases, serious detriment to the amenities of the locality.

The Agency will however attach conditions to a licence, relating to site preparation, infrastructure and operation, pollution control and completion, monitoring and records. Failure to comply with any condition of a licence is an offence.

The Agency has a duty to ensure compliance with licence conditions, and ensure that the prime objectives of the licensing system are being achieved. This involves making frequent inspections of licensed facilities, and taking enforcement action if necessary. The Agency also has a duty to assess all licences for compliance with the EC Directive on groundwater protection (80/68/EEC) and many of the licences in the area are undergoing such reviews. Licences can only be surrendered when the Agency is satisfied that no future pollution is likely.

Special Wastes

Certain wastes are regarded as being particularly difficult or dangerous to dispose of, and are subject to additional controls. 'Special Waste' controls were first introduced in 1981, and a

1.9 Waste Management

new set of regulations came into force on 1 September 1996. Typical examples of Special Wastes include acids, alkalis, industrial solvents, oils, pesticides and pharmaceutical compounds. The regulations require waste producers or carriers to inform the Agency of the intention to dispose of a consignment of Special Waste, and a consignment note tracking system then provides confirmation that any particular consignment of Special Waste has been disposed of at a site licensed to receive it.

Transfrontier Shipment of Wastes

The movement of wastes between different countries for disposal or recovery has generated much concern in recent years. Legislative controls were introduced in 1988, to regulate the movement of hazardous wastes within, into and out of the EC. In 1994, the UK Transfrontier Shipment of Waste Regulations came into effect, relating to the movement of all wastes for recovery and disposal.

Registration of Waste Carriers

With certain exceptions, any person who transports controlled waste in the course of their business, or in any other way for profit, must register with the Agency. Registration can be refused or revoked under certain circumstances.

These provisions are an integral feature of the Duty of Care system, which requires persons to take all reasonable steps to ensure that waste is contained, handled and disposed of safely. In particular, waste must only be transferred to authorised persons (such as registered carriers or holders of waste management licences), and such transfers must be documented. The objective is to assign a clear responsibility for waste at every stage from point of origin to place of final disposal, in order to avoid environmental pollution or harm to human health.

Enforcement

The Agency's enforcement role derives from the fact that any person who fails to comply with any of the regulatory provisions outlined above is committing a punishable offence. In practice, the most obvious result of illegal waste disposal activity is flytipping, which can give rise to public health risks, environmental pollution and detriment to amenity. A variety of control measures is available, ranging from discussion and persuasion through enforcement notices and ultimately action in the courts.

Landfill Consultations

Planning Authorities are required to consult the Agency on planning applications for developments within 250 metres of existing or former landfill sites. The purpose of this is to ensure that new developments are not exposed to known environmental hazards from landfill sites. The Agency will also supply information directly to developers and others about particular landfill sites, or carry out searches for landfills in the vicinity of specified locations.

1.9 Waste Management

Sustainable Waste Management

The Environment Act 1995 created a new duty for the Secretary of State to prepare a waste strategy - the consultation paper for which was launched in June 1998, titled "Less Waste, More Value". A strong emphasis will be placed on waste minimisation, reuse and recycling.

There are currently some waste minimisation projects running within the area. Studies indicate that good practice measures can reduce solid waste by an average of 13%. In addition raw material usage, power and water consumption, and labour time and costs can be lessened significantly.

The ELiminate project (the East Lancashire Waste Minimisation Club) has recruited 18 companies to date and teams and champions have begun work on waste, water and energy problems in each company. The project was initiated by three partners; Groundwork Blackburn's Business Environment Association, Northern Technologies and the East Lancashire Business Environment Network (ELBEN). The Environment Agency is on the project's steering group. Other projects in the area include the Business and Ecology Demonstration project, which is managed by the National Centre for Business and Ecology at the University of Salford, and Environet 2000, which is managed by Nimtech, the North West Technology Centre. There is potential to develop further initiatives within the Salford, Bolton, Bury and Rossendale areas.

The Environment Agency will also be a key player in the delivery of the strategy and its future development:

- through improved collection of data, by carrying out surveys of waste arisings and facilities
- through its regulatory functions in relation to wastes (including new responsibilities in relation to producer responsibility for packaging waste)
- through advice and guidance on good waste management practices and by sponsoring research.

In addition the Agency will provide relevant information to assist:

- waste collection authorities in their recycling plans, and in deciding their collection arrangements for household waste
- waste disposal authorities in determining their contracts, with an objective assessment of the environmental costs and benefits of the various options for dealing with household waste
- local planning authorities with the information they require for development plans.
- input to proposed regional waste management strategies

1.9 Waste Management

Packaging Regulations

The Producer Responsibility Obligations (Packaging Waste) Regulations 1997 aim to reduce the amount of packaging waste going to landfill. This will be achieved by placing legal obligations to recycle and recover packaging waste directly on those who produce or use it. Those companies handling 50 tonnes or more of packaging per year, with an annual turnover of £5 million (reducing to £1 million in the year 2000), will be obligated if they are involved in at least one of the following activities; manufacturing raw materials used for packaging, converting raw materials into packaging, packing or filling packaging or selling packaged goods to the final consumer.

Local Perspective

The Croal/Irwell LEAP area is heavily populated and industrialised in the south, around Salford and Trafford Park, contrasting with the more rural areas further north, although pockets of residential and light industrial areas lie around the main towns of Bolton, Bury and Rawtenstall. The entire area is well served by the national motorway network and therefore attractive for industrial development and distribution centres.

The south of the area is undergoing substantial redevelopment, due to the demise of the more traditional heavy industries. This redevelopment is generating large quantities of contaminated demolition waste, causing disposal problems. Light industry and warehousing is replacing the old heavy industries, and widely differing wastes are arising, such as solvents, packaging and tanker washings.

The central part of the area, around Bolton and Bury, now has a wide diversity of light and service industries having lost a considerable amount of their traditional textile and heavy industry, although paper production still features strongly. Some of the area is rural, with agricultural connections.

The north of the area is predominantly rural in nature, with pockets of light industrial development - mainly built in former mill buildings and within purpose built industrial estates.

The majority of waste generated in the area is taken to local waste transfer stations, for sorting, or treatment plants prior to end disposal. The transfer and storage operations are variable in terms of size and operation - most handle a wide range of controlled wastes, or particular materials such as chemical or clinical wastes. These sites make a significant contribution towards materials recycling.

1.9 Waste Management

There are 98 licensed waste management facilities in the area and the breakdown is as follows:

Landfills*	(co-disposal)	4
Landfills*	(industrial/commercial)	10
Landfills*	(inert)	15
Transfer Stations		33
Household Waste Sites		7
Storage Site		1
Treatment Plants		13
Clinical Waste Incinerators		3
Car Breakers		3
Scrapyards		6
Drum Reconditioners		3

*Of the 29 landfills listed above, only 12 are operational, as shown in Map 17.

The majority of the landfills only accept inert waste, most commonly building and construction industry waste even if they are licensed to take non-inert waste types; this is partly due to the increasing economic pressure from environmental monitoring costs and potential remediation works necessary to fulfil licence holder's obligations prior to licence surrender, as well as generally broadening liability for environmental pollution. There are also 259 closed landfill sites, many of which pre-date formal licensing controls under the Control of Pollution Act 1974. These are often found in clusters along the Croal and Irwell rivers, where historically the heavy industry was located. These are typically addressed when land is to be developed, and the Agency is consulted on all planning applications where development is to take place within 250m of such a site.

The incinerator at Raikes Lane in Bolton accepted large quantities of domestic and trade waste, but is presently undergoing major investment and is non-operational as an incinerator. Once operational, emission standards will have been improved and waste will be burnt using a waste to energy plant. It will require an authorisation from the Environment Agency. There are clinical waste incinerators at two of the hospitals in the LEAP area, both authorised by the local authorities, and at the pet crematorium in Rossendale, licensed by the Agency. The storage of waste prior to its incineration is licensed and regulated by the Agency.

The household waste sites are provided for local residents to deliver household wastes free of charge, and all have recycling facilities for wastes such as paper, plastic, oil and metal. The Government has set a target to recycle 25% of household waste by the year 2000, but progress has been slow. The information is not available for the LEAP area, but the recycling rates, for 1995/96, of the local authorities which fall mainly within the catchment are found in table 7 below. The average rate of household recycling in North West was 4.2% for that year.

**Croal/Irwell
Local Environment Agency Plan
Map 17**

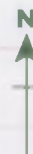


**ENVIRONMENT
AGENCY**

**Licensed Operational
Landfill Sites and Major
Treatment Plants**

KEY

- Area boundary
- Main river
- Minor river
- - - - - Culverted river
- Canal
- Built up area
- ▲ Non-inert landfill
- ▲ Inert landfill
- Treatment site



0 10km

1.9 Waste Management

Table 7 Recycling by Local Authorities in 1995/96

Local Authority	Tonnes of Household Waste Collected	Percentage of Household Waste Recycled
Blackburn	45 526	6.5%
Bolton	120 487	4.4%
Bury	87 057	2.6%
Rossendale	16 955	4.8%
Salford	110 929	2.6%

Industry already recycles large amounts of waste, either in-house as part of a process, or through the established reclamation industry, and an often overlooked portion of this is spoil and rubble arising from construction works. The Packaging Regulations also place legal obligations on some companies to recycle and recover packaging waste. There are approximately 75 companies obligated under these regulations in this LEAP area. Associated with these regulations are the reprocessors of the packaging waste; five paper reprocessors and one plastics reprocessor have voluntarily been accredited by the Agency.

The introduction of the landfill tax on 1 October 1996 had the effect of greatly increasing the price of disposing of waste by landfilling - in some cases by around 60-70% overnight. As disposal costs at licensed facilities continue to rise, sites exempt from the need of a waste management licence, due to either the size or nature of their operation, are playing an increasingly important role in the sustainable development of the area.

The number of sites registered exempt in the area is 395 in total. These include:

Landspreading	23
Land reclamation	19
Composting	1
Storage and use of construction and demolition waste	53
Baling and sorting of waste	37
Metal recycling sites	67

The introduction of the landfill tax was intended to encourage more sustainable alternatives to landfill, but there are fears that this increased cost will encourage flytipping. In response to this the Environment Agency has carried out a survey of flytipping incidents reported to Local Authorities and the Agency. The survey looked at flytipping incidents before and after the introduction of the landfill tax. Overall in the South area, flytipping has increased by 9%, but much of this increase is due to improvements in Local Authority record-keeping. The survey

1.9 Waste Management

was conducted on Local Authority and not LEAP boundaries; however information collected from 5 Local Authorities (Bolton, Bury, Manchester, Salford and Trafford) within the LEAP catchment indicate that there was a total of 4664 flytipping incidents reported for the year 1996/97, an increase of 15% on the previous year. In addition, Environment Agency Enforcement Officers dealt with an estimated 120 reports of flytipping in these Boroughs. Even without any major impact from the landfill tax, it is clear that flytipping incidents are substantial in the area, and further action should be taken to reduce it. (This links with Issue 24 of the Croal/Irwell LEAP Consultation Report).

One of the measures introduced to counter the problem of flytipping is the Duty of Care imposed on producers of waste to ensure that their waste is only passed on to authorised persons. Anyone wishing to carry waste from a producer must register with the Environment Agency, and the Agency has the power to refuse or revoke registrations should carriers be deemed unfit. The LEAP area has approximately 600 registered waste carriers.

The presence of major industry in the area gives rise to significant production of Special Waste, most of which is treated within the area. However final disposal, once the waste has been treated, generally takes place in landfill sites outside the area. There are 24 sites in the area licensed to accept and treat special wastes, one of which receives waste from Europe. In addition, there are three sites with IPC authorisations which receive transfrontier shipments of waste from Europe.

1.10 Fisheries

General

This use covers both game and coarse fisheries. The Environment Agency has duties to maintain and develop fisheries and to further the conservation of fish species. It aims to do this by protecting and improving fish stocks and their environment; the regulation of fishing via rod licencing; promoting good fishery management, fishery development and the control of fish diseases.

Fish populations are effected by the quality and quantity of water as well as the availability of suitable physical habitat features. Fish are, therefore, important indicators of the overall health of a water body.

Local Perspective

The Agency routinely undertakes fisheries surveys on all the rivers within this area. Using methods currently available, the Environment Agency is unable to survey the lower reaches because of the large width and depth of the rivers. The results of the latest surveys, together with an indication of the species that might be expected, according to the physical habitat, are shown on map 18.

The physical habitats available within the Croal and Irwell river catchments would be suitable for non migratory salmonids in the upper reaches and mixed coarse fish in the lower reaches.

In general the survey results indicate that many of the upper reaches of rivers contain populations of brown trout as would be expected. There are however isolated stretches that contain no fish or only marginal species such as bullheads or sticklebacks e.g. the River Irwell at Bacup and Swinnel Brook at Rawtenstall. This is probably due to unsuitable water quality, lack of habitat or low flows during drought conditions.

Lower down the catchment, details about the fishery depends on information obtained from individual anglers and the angling clubs that control the fishing rights on the River Croal and Irwell. Anecdotal information and improvements in angling catches indicate that the fisheries are improving. This may be an indication of the success of our stocking activities within the area. River reaches have been selected where stocking will supplement the fish populations to help develop self sustaining fish populations in the future.

During 1995, 1996 and 1997, fish were introduced at various locations including Astley Brook, Bradshaw Brook and Eagley Brook in the Croal catchment as well as in the River Ogden and the River Irwell. Species such as chub, dace and roach were supplied from our Leyland hatchery, with brown trout being supplied from a local fish farm. Surveys are planned to monitor the continued success of these introductions. The overall objective is to develop and sustain a natural fish population appropriate to the catchment.

In order for this to be successful, a diversity of natural river features are required to ensure a variety of habitat, including riffle/pool sequences and weed beds for feeding and spawning, as

1.10 Fisheries

well as the presence of bankside vegetation to provide adequate shade, cover and refuge.

Access by fish to all sections of river is necessary to sustain a viable population. Therefore the passage over or through obstructions is required. (This links with Issue 9 of the Croal/Irwell LEAP Consultation Report).

Angling

Quite a few small water bodies around Smithills Moor have facilities for angling such as Bryan Hey Reservoir, Temple Road Reservoir and Victoria Lake.

There are many reservoirs and still waters where coarse fishing takes place. These include Clifton Marina and Elton Reservoir where day tickets are available, which come under the control of the Croal/Irwell Valley wardens and also Crompton Lodge at Moses Gate. Coarse fishing is also available at Jumbles Reservoir, which is controlled by North West Water, (the Croal/Irwell Valley Wardens responsibility begins on Bradshaw Brook at the foot of Jumbles Reservoir). Bradshaw Hall Fishery is also a day ticket coarse fishery with five lodges all of which fish well, especially during the summer months. Matches are frequently held there, with catches weighing up to 98lb.

Wayoh Reservoir near Edgworth has mixed fishing whilst Ogden, Entwistle and Dingle Reservoirs have fly fishing for trout.

The River Irwell has fishing along the majority of its length from Bury to Manchester City Centre, whilst fishing also takes place along the lower reaches of the Croal. Bradshaw Brook and Eagley Brook are also good trout fisheries. Stretches of the Manchester Bolton and Bury Canal are also popular for fishing between Little Lever to Hall Lane, and at Ladyshore.

Water quality improvements have encouraged the development of an apparently thriving coarse fishery near the confluence with the River Irwell and Manchester Ship Canal. (This links with Issue 7 of the Croal/Irwell LEAP Consultation Report).

**Croal/Irwell
Local Environment Agency Plan
Map 18**



**ENVIRONMENT
AGENCY**

**Fisheries: River Habitat
Potential and Actual Fish
Species Recorded**

KEY

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

- | River habitat potential | Species recorded from surveys |
|-----------------------------|-------------------------------|
| — Trout | ● |
| — Minnow | ● |
| — Chub | ● |
| — Bream | ● |
| — Minor coarse species only | ● |
| — No fish | ● |



0 10km

1.11 Ecology

General

The Environment Agency has a duty to promote and enhance the conservation of the environment in all its activities and those of third parties. It does this by assessing, minimising and mitigating the ecological impacts of its own maintenance and engineering schemes and influencing local authorities, developers, landowners and other bodies through the planning and regulatory system and general liaison. We will seek to protect all designated sites, the wider countryside and all habitats of local importance associated with watercourses, ponds and wetlands, and seek to influence outside organisations to protect terrestrial habitats of importance.

Local Perspective

There are nine Sites of Special Scientific Interest (SSSI's) in the area. Eight of these are designated for their biological and/or ecological value, while Ash Clough, is a geological SSSI.

There are approximately 142 sites that have been designated by the Local Authorities for their nature conservation value. These are known as Sites of Biological Importance (SBI) in Greater Manchester and Biological Heritage Sites (BHS) in Lancashire. These sites are recognised as being of importance for nature conservation in a county, district or local context for the habitats, plants or animal species they support.

Croal Catchment

The Croal sub-catchment has contrasts in its character which affects the ecology and conservation interests of its river corridors. The north and north west sections of the catchment are largely upland and open in character. The upper tributaries of the Croal flow through steep wooded cloughs with a diverse range of habitats. The south and south east part of the catchment is more low-lying and is densely populated as part of the Metropolitan Borough of Bolton. Watercourses and their corridors in this area have often been constrained by urban developments which have affected their character and in some places has led to their channelisation. The River Croal itself is largely open and is protected by policies such as the River Valley Policy and the Greenbelt Policy, which seek to retain the river valley as open land for wildlife, recreation and amenity purposes.

Watercourses of high ecological interest include Bradshaw Brook, Eagley Brook and its tributaries, Gale Brook, Astley Brook, Dean Brook and Ravenden Brook. The following sites are particularly important and require sensitive management to retain and conserve their existing high conservation value ;

- Gale Brook forms part of an SSSI for much of its length
- a section of bank of the River Tonge in Bolton is a geological SSSI
- the headwaters of Middle Brook rise within Red Moss SSSI - a lowland peat mossland
- wetland habitats associated with the upper section of Eagley Brook are designated as Oakfield SSSI and Longfield Clough SSSI.

1.11 Ecology

The remaining rivers and their corridors have some features of conservation value associated with them, but would benefit from enhancement to improve their value as wildlife corridors, for example River Tonge, Middle Brook and Blackshaw Brook.

Irwell Catchment

The River Irwell is a significant river in the context of Greater Manchester and the urban Mersey Basin. There are a large number of designated conservation sites associated with the many tributaries of the Irwell, giving an indication of its ecological value.

Upstream of Ramsbottom, potential habitats in the narrow valley bottom have been replaced by ribbon developments along main transport routes. However, development has generally not extended up the steep wooded banks and acid moorland slopes which characterise the upper corridor. Moreover, significant numbers of bankside trees and rock outcrops remain.

Many of the banks have been reinforced with stone walls. The walls themselves are often of local conservation value, providing habitats for lichens, mosses and invertebrates. However, the unwallled sections allow for more natural features to develop. Variety in width and flow, vertical earth cliffs, undercut banks and exposed tree roots are of particular value.

The geology of the catchment has given rise to a river bed of boulders, cobbles and gravels. This has been eroded and deposited to form the shoals, riffles, pools and deeper slack water which are of such ecological value.

Limy Water, Whitewell Brook and the River Ogden are very similar in character to the Upper Irwell. These upper tributaries are constrained by development towards their confluence with the Irwell. They are generally most unspoilt upstream, where they are less accessible from main roads and railways. This is particularly true of Dearden Brook at Dearden Clough. The brook drains off Scout Moor SBI and is of very high local ecological and geomorphological value as an SBI itself.

Between Bury and Summerseat there are notable lengths of wooded corridor and banks, scrub, flushes and marshy areas. There is ecological interest in the river bed, although much of the flow is quite uniform, apart from weirs and mid channel islands. Much of the adjacent and bankside habitats are degraded and under development pressure.

Kirklees Brook is of high local conservation interest and is designated as SBI for much of its length. Upstream is a series of meadows with a diverse flora, some species are regionally uncommon. The Kirklees Valley downstream is characterised by a large number of lodges and an interesting range of industrial and semi-industrial habitats. The non-native invasive pest species Giant Hogweed is found in this valley. The river corridor is less diverse through the most industrial stretches where the brook is walled and culverted. However the channel itself is of conservation value. For example, dippers feed from the large number of weirs and riffles, kingfishers benefit from overhanging branches.

**Croal/Irwell
Local Environment Agency Plan
Map 19**



**ENVIRONMENT
AGENCY**

**Designated Sites of
Conservation Interest**

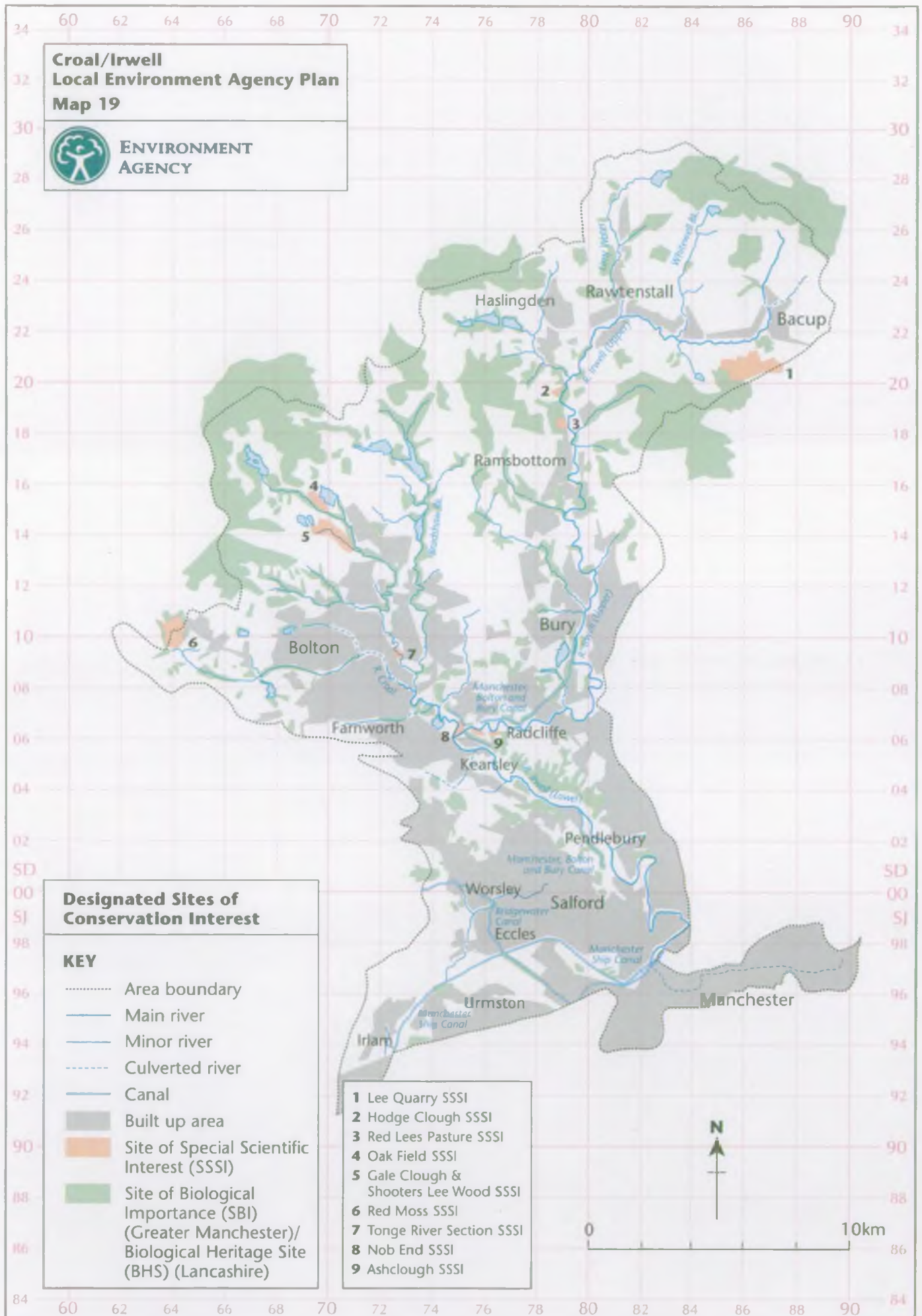
KEY

- Area boundary
- Main river
- Minor river
- - - - - Culverted river
- Canal
- Built up area
- Site of Special Scientific Interest (SSSI)
- Site of Biological Importance (SBI) (Greater Manchester)/ Biological Heritage Site (BHS) (Lancashire)

- 1 Lee Quarry SSSI
- 2 Hodge Clough SSSI
- 3 Red Lees Pasture SSSI
- 4 Oak Field SSSI
- 5 Gale Clough & Shooters Lee Wood SSSI
- 6 Red Moss SSSI
- 7 Tonge River Section SSSI
- 8 Nob End SSSI
- 9 Ashclough SSSI



0 10km



1.11 Ecology

Holcombe Brook is also of high conservation interest. The predominantly wooded corridor with steep rocky banks and valley sides is designated a SBI for its whole length. Its character is affected by two on-line reservoirs. The sites of several old mills are overgrown and their lodges and mill ponds have developed into valuable wetland habitats.

A number of smaller tributaries, such as Elton Brook, Crow Tree Farm Brook and Pigs Lee Brook have been particularly degraded by development. They have been constrained by buildings to the banktop and devalued by unsympathetic bank works.

Between the confluence with the River Croal and Radcliffe, the Irwell flows through a dramatically incised valley with a wide and varied bed. Two particularly important exposed scarps form Ash Clough geological SSSI. Here, as elsewhere in the catchment, extensive natural regeneration and tree planting have masked some of the destructive effects of its industrial past. Landscaping of tipped areas has generally given rise to mediocre immature habitats. Nob End SSSI, however, is an old Leblanc chemical waste tip that has naturally developed a rich calcareous flora. Lower Hinds, a similar tip upstream of Bury has not retained the same ecological interest.

The Irwell through Radcliffe and parts of Bury is heavily constrained where the backs of tall buildings crowd to the banktop.

Most of the Lower Irwell (downstream of the confluence with the Croal) is heavily urbanised with the river corridors often providing the only substantial areas of public open space within the catchment. These remaining green spaces, associated with the river valleys, are very valuable in the local context and many are protected in local planning policy.

The Lower Irwell has been straightened for much of its length, and constrained within walls or sheet steel piling, which restricts habitat diversity. Poor water quality and urban debris impose further restrictions on the diversity of in channel habitats. However, it does have a stoney substrate with some riffle/pool sections, even within the channelised sections.

Scattered bankside trees and shrubs, wooded stretches (for example Kearsal Dale SBI), small pockets of unimproved grassland, adjacent wetland and marsh areas (for example Oakwood SBI), and scrub patches provide additional habitat diversity and conservation interest within the river corridor.

There is an area of peat mossland at Clifton Moss, near Swinton, which has been colonised by a complex mosaic of habitat types including dense scrub, tall herb and marsh, acidic and neutral grassland. There are several small areas of open water associated with localised reedbed, swamp and bog. The site is of botanical, amphibian, invertebrate and ornithological interest.

Kearsal Dale is a large area of woodland, acidic and neutral grassland, open water and marsh associated with a large meander of the River Irwell at Kearsal. Although heavily used for informal recreation, the size of the site, the density and range of species and habitats found,

1.11 Ecology

make it a very valuable site for wildlife, especially amphibians, invertebrates, birds and small mammals.

Of its lower tributaries, Unity Brook, Singleton Brook and Slack Brook are of most conservation interest with SBI's in places along their lengths.

The downstream length of Unity Brook lies within a broad-leaved clough woodland with patches of acidic grassland, species rich marsh, reedmace reedbed, heath land and tall herb/bracken. The corridor is of value to birds, butterflies, moths and damselflies. The non-native invasive pest species Himalayan Balsam and Japanese Knotweed are becoming extensive throughout this length.

Slack Brook has steep banks supporting tall herbs, neutral grassland and willow scrub, with large populations of common spotted and marsh orchids. The ground is made up of consolidated power station ash. Low level ledges at the toe of the bank support further marsh orchid populations, rushes, shrubby willows and horsetails. Extensive ochre deposits are present giving the watercourse an unsightly appearance.

The southwest corner of the plan area drains to Worsley Brook. Habitats associated with this area include wet woodlands, reservoirs, ponds and non-main river tributaries. Several of these areas are SBIs.

Platts Brook, in Irlam, runs into a part of the old channel of the River Irwell that was isolated by the construction of the Manchester Ship Canal. This is an SBI with two substantial areas of open water supporting varied marginal flora, of value to birds and amphibians. The brook links the two water bodies and flows through willow carr woodland with a swampy field layer.

Culverts

Existing long lengths of culvert include :-

Croal - Bolton Town centre

Captains Clough Brook

Will Hill Doe Hey Brook

Blackshaw Brook

Riding Gate Brook

Greave Clough - Bacup

Pigs Lee Brook - carr bank

Elton Brook - under playing field, industrial site and a tip in Bury

Alden Brook - through Sunny Bank

Redevelopment of a site containing a culvert presents a good opportunity to open up the watercourse to create an attractive water feature. This would remove a barrier to fish and wildlife and restore continuity in the riverine environment.

Opening up culverts as part of river restoration schemes may be possible in certain

1.11 Ecology

circumstances. The most suitable sites are those which run through uncontaminated green space with scope for the reintroduction of meanders. Other sites may be too deep and involve removal of too much spoil.

Biodiversity issues

In pursuance of the Government's commitment to biodiversity conservation, the Agency will be helping to develop and implement targets for species and habitats of conservation concern. These will relate to the targets for key wetland species and habitats as identified by the UK Biodiversity Action Plan, emphasising the contribution that North West Region can make in a national context.

A regional Biodiversity Audit, is currently being drawn up to pull together all existing records of plant and animal groups in the north-west region. This information will be used to identify species and habitats of national and local concern and highlight gaps in the existing data. (Please refer to the Croal/Irwell LEAP Consultation Report, section 4, Protection through Partnership).

The Greater Manchester Ecology Unit is producing a Biodiversity Audit for Greater Manchester as a first stage of a Biodiversity Action Plan.

Lancashire County Council, Lancashire Wildlife Trust and English Nature have recently reviewed Lancashire's non-statutory wildlife site system (Biological Heritage Sites). Part of this process involved the production of habitat and species based 'Guidelines for Site Selection'. The development of these guidelines has made a significant contribution to the biodiversity of Lancashire having involved much of the work that is necessary for a biodiversity audit of the County. It is considered that statutory sites (such as SSSI's) and non-statutory sites represent the critical environmental capital of Lancashire's biological resources.

Key Species for the Croal/Irwell area include water voles, water shrews, great crested newts, barn owls and bats. **Key habitats** include reedbeds and ponds. The regional and local audits will provide information on local sites of value for individual species

The **water vole** was once common and widespread in lowland Britain but has suffered a significant decline in numbers and distribution as highlighted by the national survey 1989 - 1990. They can be described as being found occasionally in this area favouring backwater streams, ponds and canals but declining. One known site is on Middle Brook, on the edge of Bolton.

Since 16th April 1998, the water vole has received legal protection through its inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This legal protection makes it an offence to intentionally: damage or destroy or obstruct access to any structure or place which water voles use for shelter or protection; or, disturb water voles when they are using such a place. There is an obligation on those who maintain the waterways, including the

1.11 Ecology

Environment Agency, to ensure that appropriate systems are in place to minimise any damage and that all reasonable ways of avoiding damage are used.

The **water shrew** is the only aquatic species of the three British shrews. It is closely associated with clear, fast-flowing, unpolluted rivers and streams, but also occurs round ponds and ditches. There are historic records of this species in the study area but little is known of its current status. Cover at the water's edge is essential to give protection from predators. Water shrews consume the equivalent of their body weight in food in a day. Invertebrates such as freshwater hoglice, shrimps and caddis fly larvae are taken in the water; on land earthworm, beetles and spiders form the main prey. Water shrews also occasionally take fish and frogs.

The **Great Crested Newt** is an internationally important species of conservation concern. It is protected under Annex IIa and IVa in the EU Habitats and Species Directive and under Appendix II of the Bern Convention which is implemented in the UK by Schedule 5 and Schedule 9 of the Wildlife and Countryside Act (WCA) 1981.

Distribution is widespread in the study area, particularly in the Wigan and Bolton areas. Suitable surrounding terrestrial habitat is necessary for feeding and for winter hibernation. The major threat is thought to be the loss and fragmentation of suitable aquatic and terrestrial habitat. This is due to natural succession, pollution, infilling, changes in agricultural practices and the spread of urban development into the agricultural fringe. The reduction in water quality of ponds through pollution and eutrophication, along with effects of land drainage, abstraction and infilling lead to a decline in numbers of ponds and the species they support.

Barn owls use river corridors for nesting and feeding, so it is vital to retain undisturbed corridors along watercourses and encourage habitat management to help this declining species. It may be possible to alter the current mowing regime of specific areas of the river corridor to increase the numbers of small mammals available as prey. The number of Barn owls using the study area is unclear

Of the 15 species of **bat** found in Britain, five are particularly associated with watercourses. These are Daubenton's bat, whiskered bat, Natterer's bat, noctule and pipistrelle. Bat populations generally are declining and the retention of mature trees with cracks or holes will help to provide roost sites, particularly in the summer. Bats and their places of shelter are protected under the Wildlife and Countryside Act 1981. Bats can use culverts, particularly stone ones, for roosting/hibernation. Their possible presence should be brought to the attention of contractors carrying out maintenance on such structures.

Threats to natural biodiversity exist in the form of introduced non native species which can often out-compete native species and could eventually lead to their disappearance. Examples include the invasive plant species Japanese Knotweed and Himalayan Balsam. These grow in dense stands and can shade out native vegetation, particularly along riverbanks, and could lead to erosion of the banks when they die back in the winter. Giant Hogweed is a perennial plant which can grow up to 5m. tall with leaves up to 1m. across. The hollow stems are attractive to children who use them as "pea-shooters" and "telescopes". However, it should not be touched

1.11 Ecology

because the plant produces large volumes of sap which, on contact with the skin, causes severe irritation, swelling and painful blistering.

Mink have often been linked to the decline in populations of otters and water voles although there are suggestions that populations were already in decline prior to the release of mink from fur farms and their subsequent rise in numbers.

1.12 Recreation and Amenity

General

There are numerous recreational sites within the leap boundary, many of which are located in the more open areas above Bolton and Bury. These sites tend to become more scarce as the area becomes urbanised. There are, however, exceptions to this such as Queens Park and Moss Bank Park in Bolton, Philips Park in Prestwich and Clifton Country Park near Kearsley.

Local Perspective

Open areas around urban and sub-urban developments are important, not only for leisure activities, but also because urban open space acts as a buffer zone, protecting the valuable rural landscapes from increased public pressure. The presence of watercourses is especially important as they are sometimes bordered by green open space which is free from development. This creates opportunities for public access and informal recreation, as well as providing habitats for wildlife.

Open space provisions range from areas of green belt land, to urban parks, to the larger country parks such as Jumbles, Moses Gate, Burrs and the Prestwich Forest Parks.

Jumbles Country Park is located along Bradshaw Brook, north of Bolton. Most of the park is occupied by Jumbles Reservoir (55 acres), the majority of which is leased to the Civil Service Sailing Club for leisure sailing and for organised events such as dingy racing. The remainder is available for use (from North West Water) by organised groups for activities like canoeing, sailboarding and sub-aqua. The park has a network of footpaths, an information centre, facilities for the disabled and a nature conservation area. Part of the reservoir is a coarse fishery with over 60 pegs. Guided walks, rambles and activity days are frequently organised by West Pennine Moors Information Service in conjunction with the Ranger Service and the Ramblers Association.

Prestwich Forest Park, adjacent to the River Irwell is made up of a number of different sites including Philips Park, Drinkwater Park, Waterdale and Prestwich Clough. The area covers approximately 200 hectares, and much of it is designated as Sites of Biological Importance (SBI). The area offers walks (some guided by the Croal Irwell Warden Service) and cycling routes, with the Outwood Trail being used for horseriding. Orienteering courses are located at Philips Park and Waterdale and fishing takes place close by at Dams Head and Kingfisher Lodges.

Walking

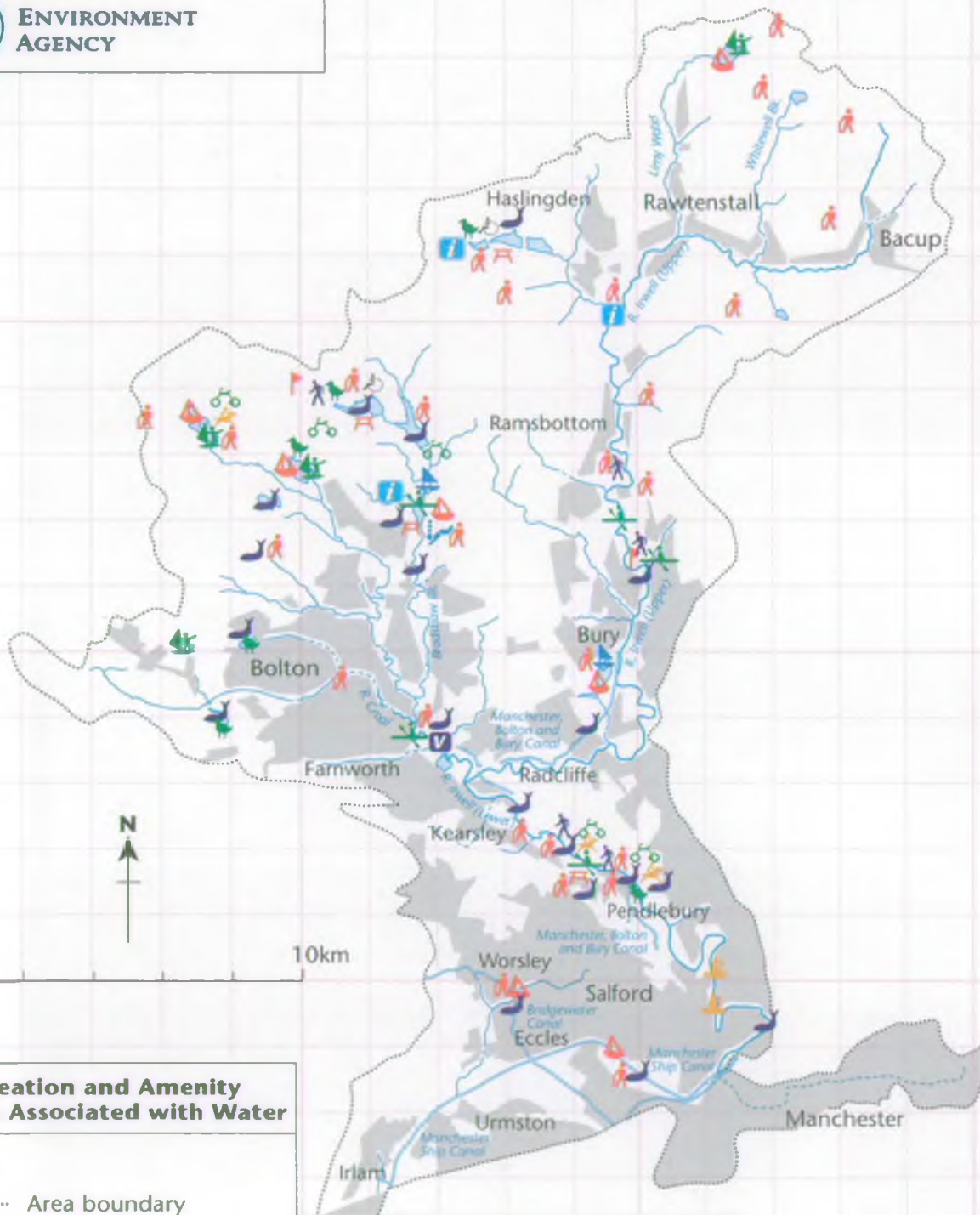
Because of the varied landscape, there are a variety of walks available. Some of the more well-known long-distance walks include parts of the 30 mile Irwell Valley Way running from Castlefield to Weir above Bacup, and the Rossendale Way around Bacup, Haslingden and Rawtenstall. The Burnley Way just touches the upper edge of the LEAP boundary.

Also along the banks of the Irwell is the Irwell Sculpture Trail which follows the 30 mile

**Croal/Irwell
Local Environment Agency Plan
Map 20**



**ENVIRONMENT
AGENCY**



**Recreation and Amenity
Sites Associated with Water**

KEY

- | | | |
|---------------------|-----------------|---------------------|
| Area boundary | Sail boarding | Picnicking |
| Main river | Boating/sailing | Horse riding |
| Minor river | Canoeing | Climbing |
| Culverted river | Windsurfing | Information centre |
| Canal | Visitor centre | Sub-aqua |
| Built up area | Rowing | Disabled facilities |
| Angling/fishing | Orienteering | |
| Walking | Cycling | |
| Birdwatching | | |

1.12 Recreation and Amenity

footpath from Salford Quays through Rossendale to the Pennine Moors. The project is funded by an Arts Lottery Award, and is currently the largest public art scheme in the United Kingdom. The first sculptures are in place between Bury and Ramsbottom, and over the next few years, more will be created along the remainder of the route.

Many walks in the area are self-guided trails, located around reservoirs such as the Wayoh, Jumbles, Turton, Entwistle and Calf Hey. The tow paths of the canals are also regularly used, with circular routes available along the Manchester Bolton and Bury Canal in one direction, returning beside either the River Croal or the River Irwell.

North West Water has information centres for customers with special needs at Clough Head in Helmshore and Jumbles Reservoir in Bolton. Disabled facilities and wheelchair routes have also been made available around Calf Hey Reservoir and Entwistle Reservoir.

Cycling

The (South) Lancashire Cycleway which is a 130 mile circular route just enters the region around Rossendale, but meets up with the (North) Lancashire Cycleway outside the area in Whalley, in the Ribble Valley.

A Cycling Strategy has been created in Bury, which plans to assist with the creation of a network of routes. There is also concessionary bridleway and cycleway running from Darwen, outside the LEAP boundary, passing close to Belmont Reservoir and continuing to Longworth Moor.

Angling

Angling is covered in the Fisheries text.

Watersports

As mentioned, many watersports take place at Jumbles Reservoir. Sailing is also available at Clowbridge Reservoir with Rossendale Valley Sailing Club, Belmont Reservoir with Belmont Sailing Club and Delph Reservoir with Delph Sailing Club. Belmont and Delph allow youth clubs to use their facilities and frequently have open days for members of other clubs. Elton Reservoir and stretches of the Manchester Bolton and Bury Canal are also used by small craft.

Burrs Country Park in Bury is located on the banks of the Irwell. The main recreational attraction is watersports which take place on the stillwaters and on the River Irwell. There is a 3/4 Grade river slalom, a figure of 8 canoe circuit and a pool for canoe training. It is hoped that a 5 mile river trail may be developed in the near future. There is also a camp site, an activity centre and access to facilities for climbing and orienteering. There are cycle routes and footpaths such as the Peel Circular Trail with guided tours led by Croal Irwell Warden Service.

1.12 Recreation and Amenity

Canoeing also takes place along most of the length of the Irwell, and especially between Ramsbottom and Burrs when there is sufficient water. The Manchester Bolton and Bury Canal feeder from the intake from the Irwell to Burrs is used regularly by Bury Canoe and Kayak Club, as is the slalom canoe course at Moses Gate Country Park. Below Burrs, canoeing is largely prevented by in-river structures such as weirs and the lack of access points. This problem continues as the river Irwell passes through Salford and Manchester. The River Croal, although relatively small, allows for canoeing along limited stretches, again with Bolton Canoe Club.

Windsurfing takes place at High Rid Reservoir in Bolton with day tickets available from North West Windsurfing Club and at Clowbridge Reservoir with tickets and tuition available from Rossendale Valley Water Park. Delph Reservoir also has facilities for windsurfing. Rowing takes place along stretches of the Lower Irwell.

1.13 Landscape and Heritage

General

The Environment Agency has a duty to conserve and enhance the natural beauty of inland and coastal waters and associated land. The Agency also has to consider the need to protect and conserve buildings and objects of historic interest associated with the aquatic environment. Nationally important sites are included, as well as local sites of value.

Opportunities for improvement are achieved by the Agency working with Local Authorities and developers and other partners and in work undertaken as part of the Agency's capital and maintenance programmes.

Local Perspective

English Nature and the Countryside Commission, with help from English Heritage, have produced a map of England that depicts the natural and cultural dimensions of the landscape. This map, "The Character of England; landscape, wildlife and natural features" divides the country into areas of similar character. For each, there is a description of the area and its ecology and character. The largest units are Natural Areas which share a similar ecology. There are two Natural Areas in the study area: the Southern Pennines and the Urban Mersey Basin. Natural Areas are usually subdivided into Character Areas which share a similar landscape character. The South Pennines Natural Area, however, is not subdivided and is one Character Area while the Urban Mersey Basin is divided into four character Areas: The Manchester Pennine Fringe, the Manchester Conurbation, Mersey Valley and the Lancashire Coal Measures. The latter area, however, makes up only a small proportion of our study area.

To the north of the Croal/Irwell LEAP area is the South Pennines Character Area, a high plateau of millstone grit covered by pasture and heather moorland. Its highest point is Winter Hill at 456 metres but there are several other peaks and plateaus about 400 metres. It is drained by fast flowing streams that have cut deep valleys. The primary land use is rough grazing. However, quarrying in Rossendale is also a major landuse with significant impacts on the area's landscape and ecology. The area is also used as a water catchment for the many small reservoirs and for informal recreation with a very dense network of public footpaths north west of Bacup. The River Irwell forms a very deep, narrow and steep sided valley. In the valley bottom the towns of Haslingden, Rawtensall and Bacup merge to form a dense ribbon of urban and industrial development. This development mostly came about in the last one hundred and fifty years. Most of the buildings are built from local stone won from the surrounding hills.

To the South is the Manchester Pennine Fringe. This is an area of gritstone underlain by coal measures with high ridges separated by deeply incised, steep valleys with fast flowing rivers. There are large areas of agriculture with a mixture of rough grazing in the higher areas and improved pasture lower down. Woodland cover is sparse and confined mainly to the steepest valley sides and cloughs. Much of this area has been exploited with many mines and quarries and small reservoirs often associated with the many textile mills that developed here. Urban areas, built generally on lower lying land, increase towards Manchester. Much of the area is urban and there are several significant towns in the area like Bury and Bolton in this character area. In these

1.13 Landscape and Heritage

urban areas there are many green corridors (often based on waterways) that extend into the town centres. These are valuable landscape and recreation features and many local authorities have policies relating to the enhancement of such corridors. The Pennine Fringe forms a transition zone between the rural uplands of the Pennines and the urbanised lowlands of the Mersey Basin.

The third character area is the Manchester Conurbation. Although largely a low lying, flat and highly urbanised area the Irwell valley provides a distinct landscape feature with a meandering river flowing through a broad flat valley floor with well defined sometimes steep valley sides. There is a large amount of open space adjacent to the river comprising sports pitches, parks, sewage works, cemeteries and hospitals as well as areas of industrial and residential development and derelict land. The river valley forms a well defined green corridor linking the centre of Manchester with the more open land between Bolton and Bury.

To the west is the fourth Character area, the Mersey Valley. In this highly urbanised and industrial area the principal features are the Manchester Ship Canal and its quays at Salford and the motorway network. The land is flat and low lying and to the west of Irlam the urban area gives way to intensive arable agriculture. The soils here are peaty and very fertile being derived from the now drained but once vast expanses of lowland raised bogs that developed here after the Ice Age.

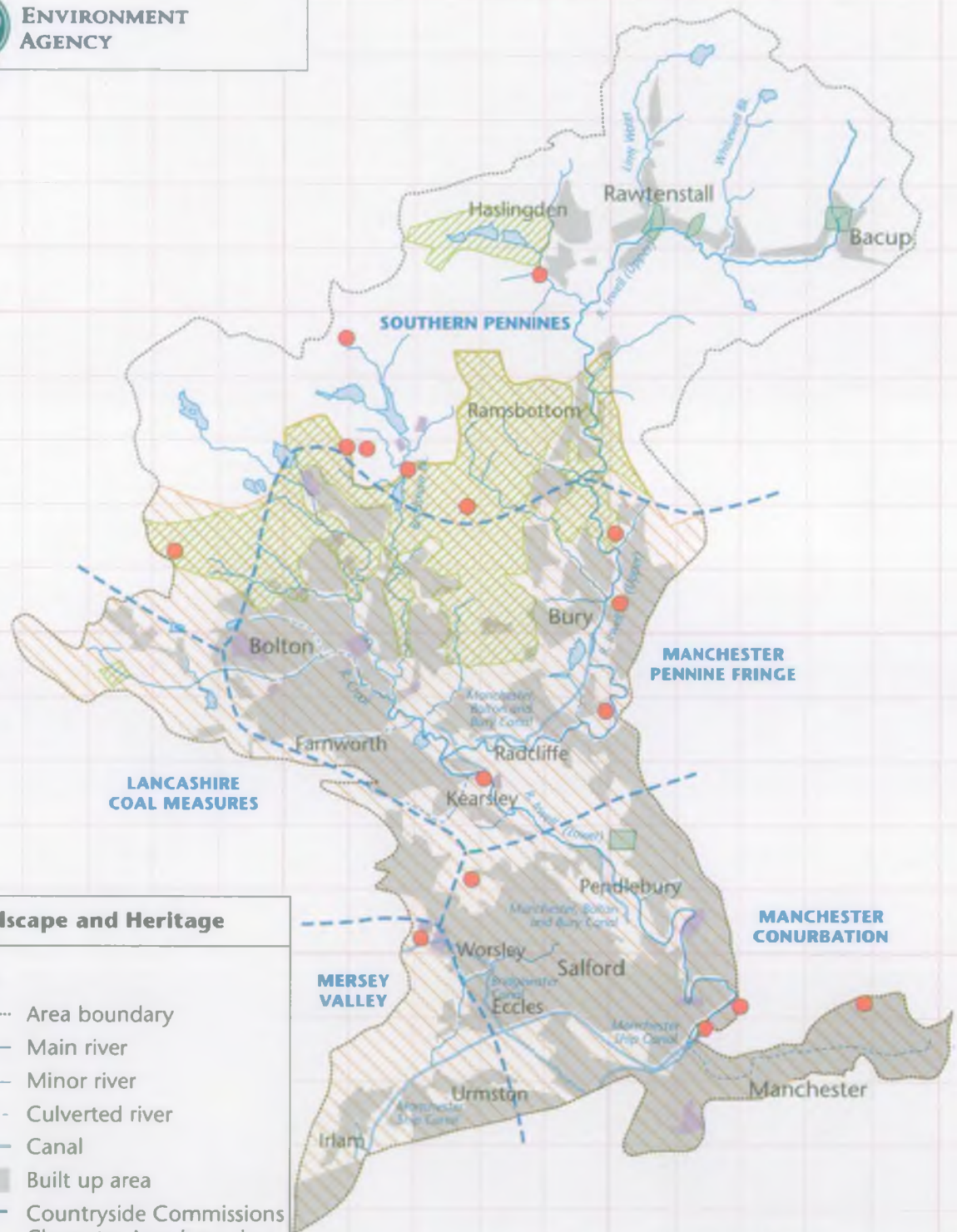
The Croal/Irwell area has long history of continuous settlement dating back to 6000 BC. The climate was warmer and wetter then and the area was covered in dense woodland. Hunter gatherers exploited the Pennine ridges where the woodland was less dense. Landscape clearance began in this area in the early Bronze age (c. 2,500 BC) and there are a number of monuments from the period which reflect increased settlement at this time. In the Iron Age (500 BC) and Romano British Periods farmers began to exploit the better drained soils of the river terraces and lived in defended enclosures on high ground above the rivers.

We know that Manchester was an important town that developed under the Roman occupation. Larger settlements grew up in the Middle Ages and saw the establishment of the first boroughs such as Bolton, Manchester and Salford. In the late eighteenth century the textile industry took off and the area became an important industrial area 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 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, 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 natural processes of aging and erosion or development for other uses and neglect.

**Croal/Irwell
Local Environment Agency Plan
Map 21**



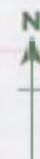
**ENVIRONMENT
AGENCY**



Landscape and Heritage

KEY

- Area boundary
- Main river
- Minor river
- Culverted river
- Canal
- Built up area
- - - Countryside Commissions Character Area boundary
- ▨ Special Landscape Area
- Registered park/garden
- Scheduled Ancient Monument
- Built Conservation Area
- ▨ Red Rose forest



0 10km

1.14 Development

General - Links between LEAPs and Land Use Planning

Planning policy within this LEAP area is guided by Regional Planning Guidance (RPG) for the North West Note 13, April 1996. This sets the strategic planning framework for the Region, highlighting development pressures and the development framework for such issues as the Environment, the Economy and Housing etc. A little under two thirds of the LEAP area is within Greater Manchester and the rest is with Lancashire.

The Croal/Irwell LEAP area in planning terms is administered by a number of Councils as shown in table 8 below:

Table 8 Local Authority Administration in the LEAP Area

Council in LEAP Area	% of Council as a part of the total LEAP Area
Rossendale BC	23.8%
Bolton MBC	22%
Bury MBC	16.7%
Salford MCC	15%
Blackburn with Darwen BC	12.3%
Trafford MBC	4.4%
Manchester MCC	3.1%
Burnley BC	2.2%
Tameside MBC	0.2%
Rochdale MBC	0.2%
Lancashire CC	26%

Each of these Local Planning Authorities (LPAs) is in the process of preparing, or has in place a Development Plan. As the Croal/Irwell LEAP boundary is based on a catchment boundary no Council is wholly contained within this LEAP area.

The Plan Area

Parts of the Croal/Irwell LEAP area have suffered structural economic decline and urban dereliction. It is recognised that the extent of derelict and under used land and the quality of the existing housing stock remains a particularly acute problem in this area. 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

1.14 Development

ways. In terms of economic assistance the whole area affords Objective 2 Status for European funding and is an intermediate assisted area under UK legislation.

Planning Policy is playing an important role in bringing about urban regeneration and environmental improvements. Green Belt Policy separates the main towns from merging and supports regeneration. The river valleys are important landscape features and are protected by the emerging Development Plans. Derelict land is still a major problem which needs to be addressed through various partnerships. The Croal Irwell River Valley Subject Local Plan 1986 has played an important role in directing positive action and investment in these two valleys. The Unitary Development Plans (UDPs), have carried forward the land use policies from this Plan and have extended the open land principles to smaller catchments. The Agency intends to work closely, wherever possible, in forwarding the intentions of this LEAP through our responses to development plans and planning applications.

The Agency supports Development Plan policies and actions by LPAs which will protect and enhance the environment in accordance with our aims and objectives.

A number of groundwater vulnerability maps have been produced which give a local perspective to national groundwater policy. District wide indicative maps have been produced for certain LPAs. Her Majesties Stationary Office (HMSO), are currently printing Groundwater Vulnerability Maps on a wider scale and four of these cover this LEAP area, namely West Cheshire (sheet 16), Derbyshire and North Stafford (sheet 17), Central Lancashire (sheet 10) and South Pennines (sheet 11). These maps are intended to increase awareness of those places where groundwater is most at risk. Those responsible for the planning of land will find them useful in learning about the potential impact proposals could have on groundwater.

Table 9 indicates the current state of development plan preparation within the area. This table highlights LPA development plan policies which we feel protect our interests. There will be a further opportunity for the LPAs to highlight which will support actions in this LEAP and potential areas for enhancement.

From the above, the Agency will seek to ensure the following policy objectives will be translated into all land-use planning policy.

**Croal/Irwell
Local Environment Agency Plan
Map 22**



**ENVIRONMENT
AGENCY**



Local Authority Boundaries

KEY

- Area boundary
- Main river
- Minor river
- - - Culverted river
- Canal
- Built up area
- - - Local Authority boundary

1.14 Development

Table 9 Current State of Development Plan Preparation Within the LEAP Area

DEVELOPMENT PLAN NAME & STATUS	LPA Plan Policies which aim to protect the environment (their plan policy reference shown)			
	AIR, WATER QUALITY AND WATER RESOURCES	FLOOD DEFENCE	FISHERIES, RECREATION & CONSERVATION	MINERALS, WASTE & CONTAMINATED LAND
Rossendale BC Adopted Local Plan	E53, E9(l)	E9(l)	E47, E9 (n)	N/A
Bolton MBC Adopted UDP December 1995	CE7	-	CE16/4, R4/1, CE17	M2/1, WD4, WD3/1
Bury MBC Adopted UDP August 1997	EN7/1, 7/3	EN5/1	EN6/3, EN10/2, OL5/2, OL5/3	MW2/1, MW4/1
Salford MCC Adopted UDP November '95	EN9, EN22 DEV1	DEV1	EN5, EN6, EN16	MW8, MW15, DEV1, DEV10
Blackburn with Darwen Local Plan	BE27, 28	-	N10, N12, N13, R11	BE26
Trafford MBC Adopted UDP May 1996	ENV30, 31, 32	ENV12	ENV6, 7, 29 OSR14, 15	ENV33, M4, WD3, WD4, WD5
Manchester MCC Adopted UDP July 1995	E3.4©	DC21.1	E3.6(C), E2.3, E3.4, E2.4	DC27.2b, DC27.3b, DC28.11d, DC28.1g, DC28.9b(iii) and (viii)
Burnley BC Adopted Local Plan Sept 1991	-	-	-	-
Tameside MBC Adopted UDP Sept 1996	M18, 22, 23	M28	C2, C6, C33, OL15, 16	M3, M4, M15, M19, M20
Rochdale MBC Modified Deposit UDP following Public Inquiry June 1997	EN47, 55	EN54	EN31, 36, 37, R10, 24	EN49, 50, M2, W4, W7
Lancashire CC Adopted Structure Plan February 1997	Policy 13, 18, 70	Policy 14, 21	Policy 19, 25	Policy 62, 64, 66, 69, 70, 76
Lancashire Minerals & Waste Deposit Local Plan	Policy 21, 22	Policy 23	Policy 3, 20, 24	-

1.14 Development

Development Policy Objectives

Integrated River Basin Management

a). Flood Defence

To discourage new buildings and land raising in areas at risk from flooding or where development could cause flooding elsewhere:

- ▶ By encouraging the protection of watercourses so they can fulfil their principal functions and contribute beneficially to the environment;
- ▶ By encouraging continuous unobstructed areas adjacent to watercourses to ensure access for essential maintenance or flood flows;
- ▶ By encouraging the protection of existing flood defences to prevent interference with the ability of the Agency and other bodies to carry out flood control works and maintenance activities;
- ▶ By highlighting where surface water storage or regulation may be necessary for catchments where increased rates and volumes of surface water run-off could cause or exacerbate flooding problems;
- ▶ By encouraging the protection and where necessary, restoring effective flood flow conveyance and flood water storage capacities of floodplains.

b). Water Quality

To protect and improve the quality of surface waters and groundwaters:

- ▶ By ensuring new development complies with the Policy and Practice for the protection of Groundwater;
- ▶ By ensuring development does not cause water pollution via discharge points and new development is served by satisfactory arrangements for the disposal of foul sewage, trade effluent and contaminated surface water;
- ▶ By encouraging, where there are sewage treatment capacity problems causing premature and high frequency overflows, new development to be phased to coincide with improved infrastructure;
- ▶ By ensuring appropriate development complies with the Control of Pollution (Silage, Slurry, Agricultural Fuel Oil) Regulations 1991 and the MAFF Codes of Good Agricultural Practice for the Protection of water, soil and air;

1.14 Development

- ▶ By ensuring leachate and drainage is controlled and monitored from contaminated land sites;
- ▶ By ensuring surface water disposal systems are protected, maintained and wrong connections are avoided.

Managing our Water Resources

To protect and manage the amount of surface water and groundwater resources to achieve the right balance between the needs of the environment and those of abstractors:

- ▶ By promoting the incorporation of suitable water efficiency measures;
- ▶ By ensuring development can be or will be served by an adequate means of water supply which will not adversely affect existing users, river flows, water quality, agriculture, fisheries, amenity or nature conservation.

Biodiversity and Enhancement of the Water Environment

To protect, conserve and enhance areas of aquatic value and other important elements of the water environment:

- ▶ By highlighting the areas of the water environment, including river corridors which are, or have the potential to be of value;
- ▶ By discouraging development which would have an adverse impact on the nature conservation, landscape, heritage, fisheries, recreation or amenity value of watercourses, ponds and wetlands or on the land physically and visually linked to them;
- ▶ By siting development away, wherever possible, from river corridors;
- ▶ By seeking to ensure development proposals protect and enhance on-site aquatic features and where development is accepted because of overriding economic or social considerations, mitigation and compensatory measures are provided, to ensure that there is no net loss of environmental value.
- ▶ By encouraging, where opportunities arise, the restoration of river corridors which have been degraded by past development.

1.14 Development

Conserving the land - Waste Disposal, Mineral Operations and Contaminated Land Sites

To ensure waste disposal, mineral operations and contaminated land redevelopment does not cause pollution or harm to human health:

- ▶ By ensuring where schemes are not controlled by the Environmental Protection Act 1990, adequate measures will be implemented to control and monitor water pollution and landfill gas,
- ▶ By encouraging compliance with the Government's National Waste Management Strategy;
- ▶ By encouraging the re-use of contaminated land sites where the degree and nature of the contamination has been assessed and appropriate measures to protect the environment incorporated.

Improving Air Quality and addressing climate change

To protect air quality :

- ▶ By ensuring certain development processes where schemes are not controlled by the Environmental Protection Act 1990 will not have an adverse effect on air quality.

**Croal/Irwell
Local Environment Agency Plan
Map 23**



**ENVIRONMENT
AGENCY**

**Radioactive Substances
(RAS) Sites**

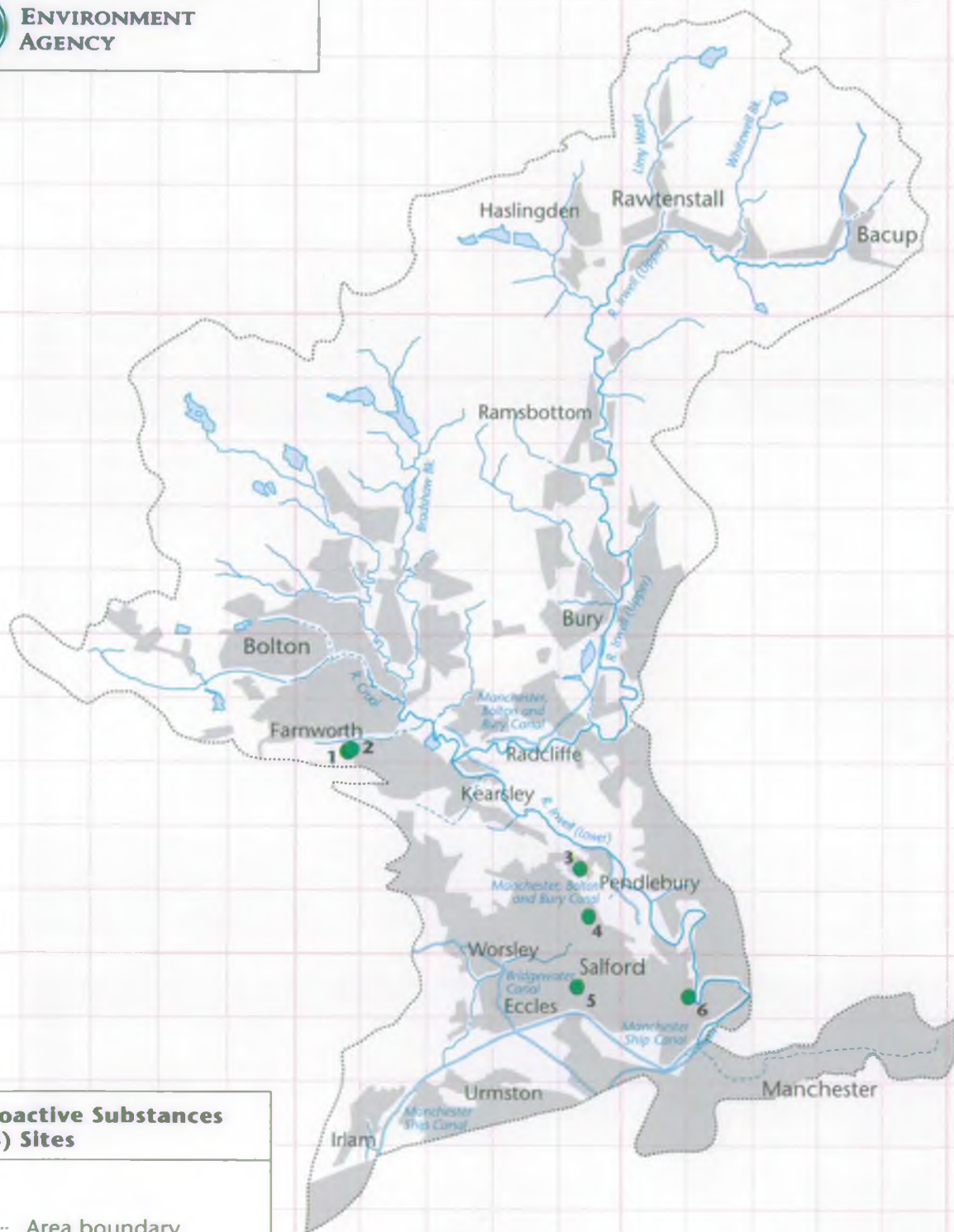
KEY

- Area boundary
- Main river
- Minor river
- - - Culverted river
- Canal
- Built up area
- RAS 93 authorised site

- 1 White Rose Environmental, clinical waste incinerator
- 2 Royal Bolton Hospital
- 3 MEL Chemicals
- 4 Hope Hospital
- 5 Royal Manchester Childrens Hospital
- 6 University of Salford

N

0 10km



1.15 Radioactive Substances

The Environment Agency has responsibility for regulating the keeping and use of radioactive material and the accumulation and disposal of radioactive waste under the Radioactive Substances Act 1993.

There are approximately 70 users of radioactive materials in the area and 5 of these are authorised to dispose of radioactive waste. The radiological impact of these disposals, mainly from hospitals and Salford University, is negligible.

1.16 Agriculture

General

Over 80% of the land in England and Wales is used for agriculture and such a widespread use has a significant impact on the environment. In some areas agriculture has contributed to the pollution of both ground and surface waters, low river flows, increased risk of flooding and damage to fisheries and areas of conservation value. However, increased environmental awareness, both by government bodies and by the farming community itself, has led to better pollution prevention practices and to significant improvements in river quality in many areas.

Legislation, grants and the increased availability of specialist advice have all been important factors in reducing the impact of farming on the environment and the Environment Agency, in conjunction with MAFF, will continue to play a central role in this process. Examples of the work of the Agency includes:

- Responsibility for enforcing the Control Of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991, which set down minimum standards for the design and construction of storage systems. The Agency also has a duty to regulate the abstraction of water for agriculture.
- Carrying out a programme of farm visits both to identify sources of pollution and to offer advice to farmers, and work closely with farming groups and organisations.
- Promotion of initiatives such as the Ministry of Agriculture Fisheries and Food (MAFF) free advice available from the Farming and Rural Conservation Agency (FRCA) on pollution prevention together with the Codes of Good Agricultural Practise for the Protection of Water and Soil, which are available free from MAFF.

The Agency's aim is to ensure that farming practices do not compromise the use of surface and groundwater and do not threaten the ecology of the environment.

Local Perspective

Large parts of the Plan area are dominated by urban development and agricultural activity is limited to the large expanses of moorland in the north of the area and to scattered areas of grassland and arable land. In 1996, there were 17,845 hectares of land in agricultural tenure, which represents just over a third of the areas land. The agricultural land is of generally poor quality, being dominated by land classified as Grade 4 and 5 on the Agricultural Land Classification.

Map 24 Shows the Agricultural Land Use Classification (FRCA) for the area.

The use of this agricultural land is predominantly grassland and rough grazing with some crops and fallow. This is reflected in the farm types, which are dominated by mixed cattle and sheep and dairy farms. There is also some pig and poultry farming and a small amount of horticulture and cereals although these account for a very small amount of the areas agricultural land.

**Croal/Irwell
Local Environment Agency Plan
Map 24**



**ENVIRONMENT
AGENCY**

Agricultural Land Use

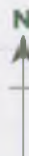
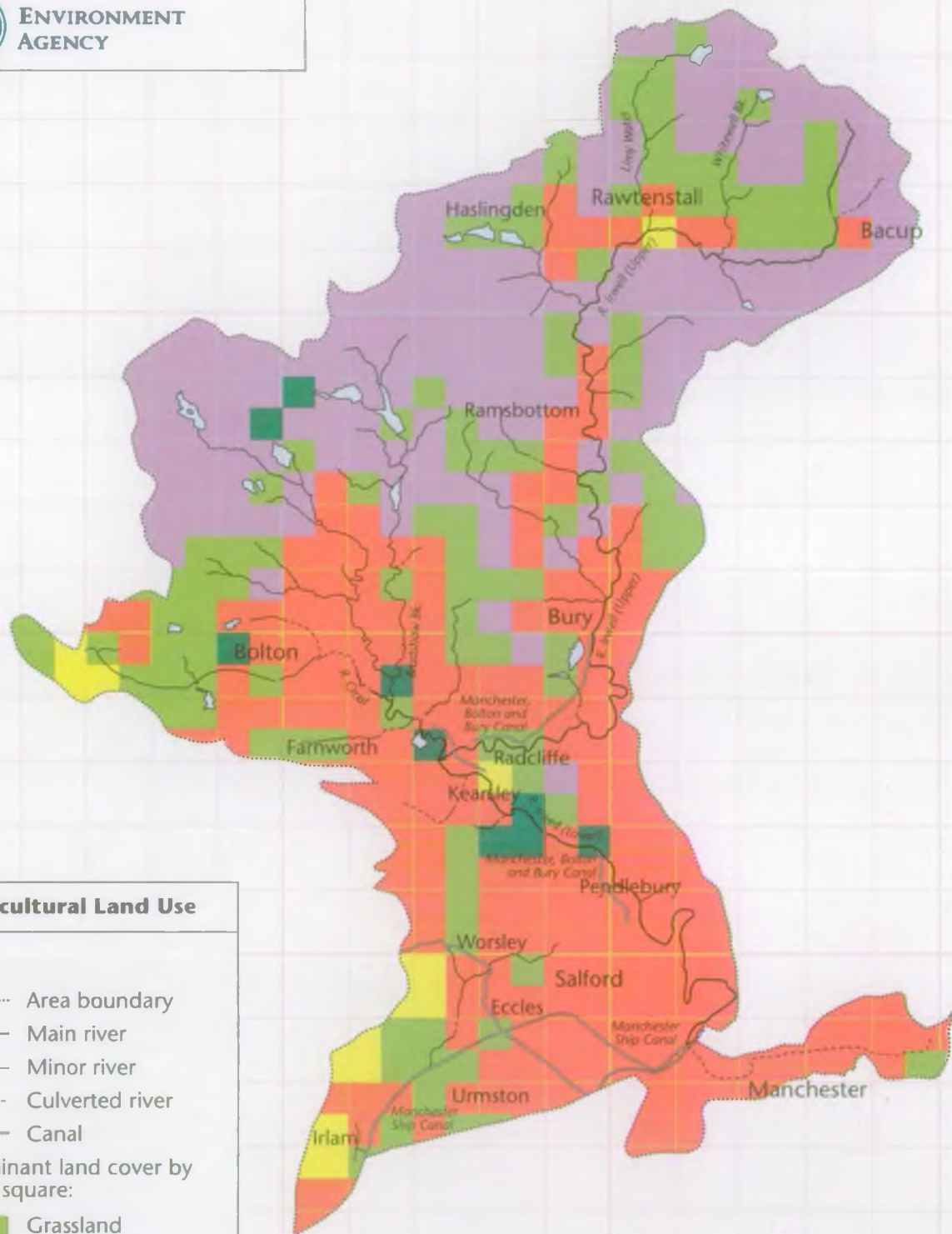
KEY

- Area boundary
- Main river
- Minor river
- Culverted river
- Canal

Dominant land cover by
1km square:

- Grassland
- Moorland/heath
- Arable
- Urban/bare ground
- Woodland

Data source: ITE Land Cover
© Crown Copyright FRCA
© Crown Copyright MAFF



0 10km

1.16 Agriculture

The agricultural employment census for the area shows that there has been an overall increase in agricultural employment over the period 1986 to 1996 due to a large increase in managers and hired workers. This is an unusual situation as grants provided by the Government through MAFF farm diversification schemes encourage farmers to diversify into non-farming activities. Although farm woodland only accounts for a small amount of the areas agricultural land, such woodland increased by over 60% between 1986 and 1996 to cover 162 hectares (ha) out of a total agricultural area of 17,845 ha. Land devoted to set-aside land is also slowly increasing and totalled 115 ha in 1996.

Appendices

Appendix 1 - Glossary

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.

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.

Appendix 1 - Glossary

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.

Appendix 1 - Glossary

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.

Appendix 1 - Glossary

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.

Appendix 1 - Glossary

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.

Appendix 1 - Glossary

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.

Appendix 2 - Abbreviations

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

Appendix 2 - Abbreviations

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

Appendix 3 Water Quality Classification

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.

Table 10 below, summarises the proposed current and long term RE RQO's for the classified stretches of the LEAP area.

Appendix 3 Water Quality Classification

Table 10 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	WHITEWELL BK TO ROSSENDALE STW	6.4	RE2 1997	RE2
IRWELL	QSL AT DEERPLAY TO WHITEWELL 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

Appendix 3 Water Quality Classification

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 BROOK	SCOUT 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

Appendix 4 Environment Agency Leaflets and Reports Available from the South Area Office of the North West Region

Listed below is a selection of leaflets available from the Environment Agency. It is intended as a guide to the type of information available rather than a complete list, as new leaflets are being produced. It does not include policy documents or technical reports.

General Information

Customer Charter - September 1997
Corporate Plan Summary 1997/98 - report
Annual Report and Accounts 1995 - 96 - report
The Environment of England & Wales a Snapshot - report
The Environment of England & Wales - Now on the World Wide Web
The Environment Agency in the North West of England
Environment Agency - Aim, Objectives, Work
About the North West - fact file
The Agency in the North West South Area - fact file
Guardians of the Environment (Thames Barrier picture)
A Guide to Information Available to the Public
Our Complaint and Commendation Procedures
Who's Who in the Environment Agency - North West
Agency Emergency Hotline - 0800 Credit Card
River Watch Credit Card
Your Rights when Agency Warranted Officers Take Action
An Environmental Strategy of the Millennium & Beyond
Corporate Plan Summary
Annual Report & Accounts 1998-1999
Corporate Plan 1998-1999
Annual Report & Accounts 1996-1997

General Environment

Garden With Care
Managing Maize

Education

Activity book - for Primary School Children
Helping Protect the Environment - (colour in) poster
Looking after our Rivers and their Environment - (things to do) poster
Understanding your Environment - poster
Agency Poster
Recruitment Information
Floodcall - (colour in) poster

Waste Regulation

Classification of Special Waste - Information Sheet 1
Use of the Consignment Note - Information Sheet 2
Special Waste Regulations 1996 - How they affect you
North West Waste Statistics 1995-96
New Packaging Regulations - How they affect you
Farm Waste Minimisation
What a Waste! leaflet
Will you be technically competent to run a licensed waste site in 1999?

Appendix 4 Environment Agency Leaflets and Reports Available from the South Area Office of the North West Region

Flood Defence

Flood Defence - North West - brochure
Paying for Flood Defence
Main River - fact file
Maintaining Watercourses - fact file
Paying for Flood Defence - fact file
Understanding Buffer Strips
Development with Flood Risk Implications
Flood Warning Information - For the Deaf & Blind
Flood Warning Information - What to do If Your Property is at Risk
0645 - Floodcall Credit Card
Who's On My Land?
Policy and Practice for the Protection of Floodplains

Pollution Control

Environmental Protection and Pollution Control - North West - brochure
EC Directives and the Control of Water Pollution - fact file
Water Pollution Incidents in England & Wales 1995 Report Summary
Bathing Water Quality Summary Report 1996
A Guide to Environmental Quality & Pollution Control - booklet
Looking After Our Rivers
Agricultural Pesticides and Water
Pollution Prevention Pays
Accreditation Scheme for Spill Response Contractors
Building a Cleaner Future
Water Most Foul - Action Recipe 10
Water Most Foul - Action Recipe 10 - poster
Blue Green Algae
Algae or Sewage?
Discharges to Controlled Waters - charges - 1997-98
Home Pollution and how to avoid it
River Pollution and how to avoid it
Silage Pollution and how to avoid it
Farm Pollution and how to avoid it
Farm Waste Management Plans
Farm Waste Regulations
Chemical Pollution and how to avoid it
Solvent Pollution and how to avoid it
Making the right connection
Natures Way - Designs that prevent water pollution
Whats Hidden Behind your Garden Fence? (Water Watch)
Groundwater Pollution
Oil Care Code stickers
Masonry Bunds For Oil Storage Tanks
Concrete Bunds for Oil Storage Tanks
Water pollution incidents in England & Wales 1996 Report Summary
The Use of Licences to Prevent Pollution

Fisheries and Recreation

Fisheries - North West - brochure
Fisheries in the North West - fact file
Buyer Beware - Guide to Stocking Fish
Rod Fishing Licences - 1996/97
Have Fun Have a Care (River Canoeists)
Have Fun Have a Care - poster
Wake Up To Your Watersides - Mersey Basin Campaign
Anglers and the Agency
Code of Conduct for Specialist Coarse Anglers (SACG)
A boater's guide to Navigation signs

Ecology

Mink
Invasive Plants
Pond Heaven
The Habitat's Directive
Aquatic weed control operation

Water Resources

Water Resources - North West - brochure
Annual Abstraction Charges 1997 - 98
Spray Irrigation

IPC/RAS

Integrated Pollution Control 1997/98 - Fees & Charges
Radioactive Substances Act Regulation 1997/98 - Fees & Charges
Best Practicable Environmental Options Assessments for IPC - A Summary

Catchment Management/Local Environment Agency Plans

Irwell Catchment Management Plan - Annual Review
Upper Mersey Catchment Management Plan - Action Plan
Sankey/Glaze Local Environment Agency Plan - Action Plan/First Annual Review
Lower Mersey Local Environment Agency Plan - Consultation Report/Action Plan
Weaver/Dane Local Environment Agency Plan - Consultation Report/Action Plan
Roch/Irk/Medlock Local Environment Agency Plan - Consultation Report

NORTH WEST REGION ADDRESSES

REGIONAL OFFICE

Environment Agency
PO Box 12
Richard Fairclough House
Knutsford Road
Warrington WA4 1HG
Tel: 01925 653 999
Fax: 01925 415 961

NORTH AREA OFFICE

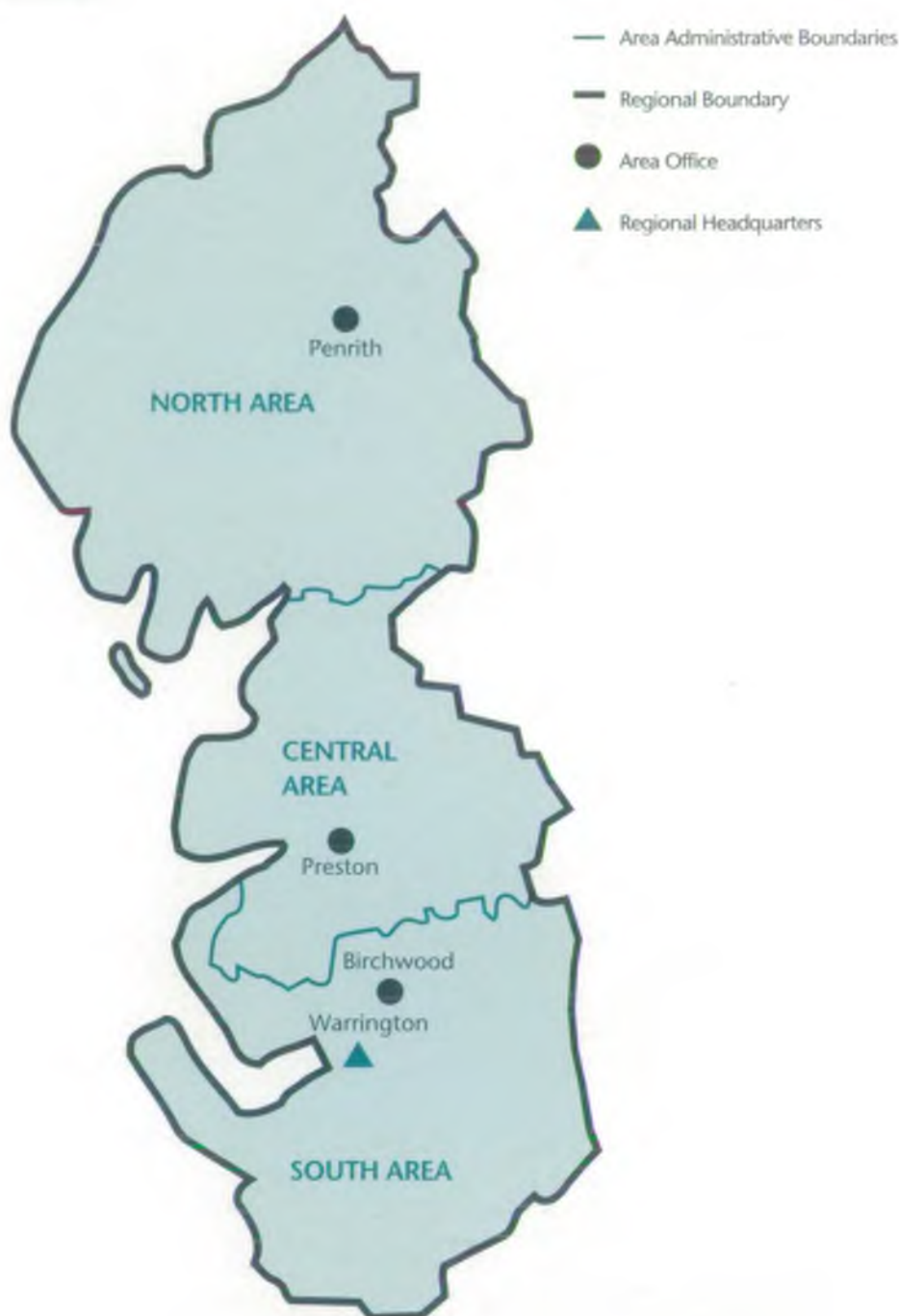
Environment Agency
Ghyll Mount
Gillan Way
Penrith 40 Business Park
Penrith
Cumbria CA11 9BP
Tel: 01768 866666
Fax: 01768 865606

CENTRAL AREA OFFICE

Environment Agency
Lutra House
PO Box 519
South Preston
Lancashire
PR5 8GD
Tel: 01772 339 882
Fax: 01772 627 730

SOUTH AREA OFFICE

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



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**