

# HUMBER ESTUARY CATCHMENT MANAGEMENT PLAN ACTION PLAN



**NRA**

*National Rivers Authority*

**MAY 1995**

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## 1. VISION FOR THE CATCHMENT

The Humber Estuary Catchment Management Plan covers the area from the mouth of the Humber Estuary to the upstream points of salt penetration at Keadby Bridge on the River Trent and Boothferry Bridge on the River Ouse. The plan area has been extended for flood defence purposes on the River Ouse up to Aire's Mouth as this provides a natural flood defence boundary. The location of the Estuary and the size of the inputs of freshwater makes the Humber of great significance in relation to the environmental management of the North Sea.

The National Rivers Authority's (NRA) vision for the Humber Catchment during the lifetime of this five year Action Plan is to work towards the sustainable management of the Humber, balancing the legitimate interests of all users of the Estuary. To achieve this vision the following key objectives are considered necessary, to:

- maintain and enhance the current national and international nature conservation value of the Estuary with particular reference to its important bird population;
- reduce the risk to people and the developed and natural environment from flooding in the estuarial plain by the provision of technically, environmentally and economically sound and sustainable defence measures;
- reduce the discharge of dangerous substances to the North Sea and improve water quality of the Tidal Ouse;
- restore a run of migratory salmonids, ie. sea trout and salmon, through the Humber Estuary;
- set Minimum Residual Flows for the Trent and Ouse which balance all water related interests;
- ensure that the recreational potential of the Humber Estuary is fulfilled;
- work with all relevant parties to implement the principles of sustainable development particularly by establishing stronger links with local communities and their representatives;
- balance the needs of commercial navigation and industrial, urban and agricultural development with the requirements of the environment;
- improve our knowledge of the relationships between sedimentary processes, rising sea levels and the natural boundaries of the Estuary.

The challenge of managing the catchment in the future lies with effectively responding to the various pressures concerning the Estuary and reconciling all of the uses demanded by the community as a whole.

To facilitate both stronger links and wider support with other interested parties, the NRA intends to integrate this Plan with the Humber Estuary Management Strategy (HEMS) currently being prepared by English Nature, Local Authorities and other groups.



## 2. INTRODUCTION

The NRA was established in 1989 as the *Guardian of the Water Environment*, committed to protecting and improving the water environment and protecting people and property from flooding. Establishing a sound planning base for the development of river catchments is essential to their future management.

The rivers, lakes, estuaries and coastal waters of England and Wales are subject to increasing activities and demands from water users many of which interact and inevitably some conflicts arise. The NRA is the major manager of the water environment in England and Wales and has the responsibility to balance and plan for the future of all water users.

Our mission statement expresses the following principles: We will protect and improve the water environment through effective management of water resources and by substantial reductions in pollution. We will aim to provide effective defence for people and property against flooding from rivers and the sea. In discharging our duties we will operate openly and balance the interests of all who benefit from and use rivers, groundwaters, estuaries and coastal waters. We will be businesslike, efficient and caring towards employees.

The NRA uses Catchment Management Planning as a means to translate the objectives of our mission statement into action plans. Catchment Management Planning offers an integrated approach to set priorities and plan for the future of specific catchments. It provides an opportunity to integrate objectives in order that any conflicts may be identified and resolved within a consistent planning

framework and coordinates NRA activities to enable the optimum deployment of investment and resources. Catchment Plans are being produced by the three regions involved in the Humber Estuary Plan for fluvial catchments that impact on the Humber.

Catchment Management Planning involves the NRA working with local authorities, industry, commerce, the farming community, interested groups and the general public to promote environmental awareness and to enforce appropriate environmental standards and ensure that the rivers, lakes, estuaries, coastal and underground waters of particular areas are protected and improved.

This Action Plan provides a planning framework to define both a strategy for future management of the catchment and a series of Activity Plans for the NRA, working with others to achieve the vision of the Humber Estuary Catchment.

The Action Plan will form the basis for improvements to the water environment outlining the areas of work and investment proposed by the NRA and other responsible parties, within the prevailing economic and political constraints up to a period of five years.

The first annual review of this Catchment Management Action Plan is due in Spring 1996. Currently the Humber Estuary Management Strategy is being prepared in parallel with the Action Plan and it is intended at this stage to have one document ensuring the Estuary is managed in a sustainable manner.



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### 3. REVIEW OF THE CONSULTATION PROCESS

The Humber Estuary Catchment Management Plan Consultation Report was published on 5 July 1994. A meeting held in Hull was attended by: industry, local authorities, environmental groups, sport and recreation groups and other local groups with an interest in the Humber Estuary Catchment. This meeting launched the plan for a four month period of public consultation. Prior to this a pre-consultation meeting was held in Hull in March 1994 with organisations with a significant interest in the Estuary in order that views could be taken into consideration at an early stage.

A draft Action Plan was presented to a meeting held in Hull on 15 March 1995 to ensure that the views of consultees have been taken into consideration where possible. The Humber Estuary Tidal Defence Strategy is an integral part of the Catchment Management Plan and was also discussed at this meeting.

The consultation report described a vision for the catchment, gave an overview of the area under consideration, outlined targets designed to achieve the objectives for the Estuary, detailed issues which need to be addressed to achieve the vision and provided options for addressing the issues. Consultees were asked to consider the range and extent of catchment uses and activities, express views on the issues and options and suggest how the Action Plan should be progressed.

During the consultation period a number of presentations were given to interested groups and an exhibition was displayed in libraries in: Cleethorpes, Grimsby, Immingham, Barton-upon-Humber, Brigg, Hull, Driffield, Goole, Beverley and Heddon.

Approximately 800 copies of the full report and over 4,000 summary documents were circulated.

Following the consultation, written comments were received from 33 organisations and several members of the public. A number of comments were also received from NRA staff to whom the document was widely circulated.

Any factual errors of the background description provided by the Consultation report that were highlighted as part of the consultation process, will be addressed as part of the Humber Estuary Management Strategy.

The following list names of all organisations who provided written comments on the consultation report:

Associated British Ports  
Beverley Borough Council  
B P Chemicals  
British Canoe Union  
British Steel  
British Waterways  
Council for the Protection of Rural England  
Countryside Commission  
Driffield Navigation Amenities Association  
East Lindsey District Council  
English Nature  
Grantham, Brundell & Farran  
Holderness Borough Council  
Hull City Council  
Humber Area Wildfowl Liaison Group  
Humber Estuary Management Strategy  
Humberside County Council  
Lincolnshire Catchment Panel (NRA)  
Lower Ouse Internal Drainage Board  
Market Weighton Drainage Board  
Ministry of Agriculture, Fisheries & Food  
National Power  
National Farmers Union, East Midlands Region  
National Farmers Union, North East Region  
North Eastern Sea Fisheries Committee  
Posford Duvivier  
Royal Society for the Protection of Birds  
SCM Chemicals - Europe  
Severn Trent Water Ltd  
Sports Council, Yorkshire & Humberside Region  
The British Association for Shooting & Conservation  
The Glanford & Scunthorpe Countryside Service  
The Inland Waterways Association  
University of Bradford  
Yorkshire Water  
Yorkshire Wildlife Trust

## 4. OVERVIEW OF THE CATCHMENT

### INTRODUCTION

The Humber Estuary receives run-off from the Trent and Yorkshire Ouse river systems, a fifth of the area of England. When considering the Humber Estuary the impact of tributaries of these river systems and also those rivers discharging from the north and south banks of the Humber itself should also be taken into account.

This is the largest catchment of any UK estuary with major industry located within the catchment including power generation, oil refining, chemical manufacturing and steel making. Sewage effluent is

also discharged to the Estuary and North Sea in various stages of treatment from Hull, Cleethorpes and other Humberside towns.

The rarity and wide range of habitats which support large populations of plants and animals has meant that the Humber Estuary is an area of great nature conservation interest which has been recognised by a range of national and international designations. However, there are many pressures on the catchment, which include industry and commerce and pressure for further development.



*Trent Falls*



## CONSERVATION AND ECOLOGY

There are seven Sites of Special Scientific Interest (SSSI) closely associated with the Estuary with a further 16 sites falling within the plan boundary. In close proximity, there are two Yorkshire Wildlife Trust reserves and seven Lincolnshire Trust reserves plus a further 14 sites identified as being of conservation interest.

The Estuary Sites of Special Scientific Interest form an area designated in July 1994 as a Special Protection Area (SPA) under the EC Directive 79/409 on the conservation of wild birds. The Estuary also qualifies under the RAMSAR Convention on Wetlands of International Importance by regularly supporting 20,000 waterfowl and internationally important populations of waterfowl species in winter. Additionally, part of the north bank is designated a Heritage Coast; Blacktoft Sands and Tetney Marshes are Royal Society for the Protection of Birds (RSPB) reserves; part of the Upper Humber SSSI is a wildfowl refuge and there are at least 45 sites within the flood protection zone identified as being of nature conservation or archaeological interest.

The Estuary supports massive numbers of birds on the intertidal mudflats and saltmarshes, both during migratory passage and as their winter residence. In terms of numbers, the Humber is one of the top five estuaries in the United Kingdom and is of national and international importance for passage and overwintering of wildfowl and waders.

The extensive intertidal mudflats and sands of the Estuary are important feeding areas for waders and the saltmarshes for warblers and other birds. Reedbeds, gravel and borrowpits, brackish ditches, hedgerows and scrub also provide valuable habitats for a variety of birds in the catchment.

These habitats are of ornithological interest all the year since they provide sources of food, safe roosts and breeding sites for waterfowl and migratory species. Thus the sites require careful management to ensure that at sensitive times disturbance is kept to a minimum or prevented altogether. This management includes taking into account the timing of engineering works and the possible deleterious effect of works within the Estuary on these habitats.

The very high number of worms, crustacea and molluscs which occur mainly in the intertidal areas are significant factors in the importance of the Estuary for its ecology and wildlife. National and international conservation designations are linked to the sustainability of these populations.

The Humber supports a small (circa 800) but important seal population, mainly on the south side at Donna Nook. At least 28 other species of mammals have been recorded, including Britain's largest summer roost of Noctule bats, at North Ferriby.

There are a large number of sites of archaeological interest in and around the flood protection zone with most sites located in the urban areas of Grimsby and Barton-upon-Humber. There is concern over the future of these sites as pressure for development occurs and as coastal realignment is considered.



*Sanderling roost at Cleethorpes*

## FISHERIES

The Humber supports populations of fish which are typical of estuaries subject to varying salinities and tidal scour. There are good populations of plaice, goby, whiting and sole. The sandflats of the outer Estuary serve as a significant nursery area for flatfish with an estimated 3% of North Sea plaice utilising the outer Estuary for this purpose. In addition, the rich food supply supports large numbers of adult and juvenile marine fish.

Eels are found throughout the Estuary and in most of the adjacent rivers and drains feeding into it and there is evidence of salmonids in the Estuary. Salmon have been observed in the Ouse, Wharfe and Trent catchments but there is no indication of stocks improving and no commercial fishery exists, however there is potential for these rivers to develop salmonid fisheries. Sole and cod are the principal saltwater fish in the Estuary and shellfish eg. shrimp, cockles, mussels and oysters are fished from Immingham to South Ferriby although the level of activity is reduced compared to previous years due to over-exploitation in the 1970's from which declining stocks have never recovered. There are three designated shellfish harvesting areas designated under EC Directives 91/492 which are subject to commercial and recreational exploitation.



*Small fishing boat*

## COMMERCE AND NAVIGATION

The Humber is one of Britain's largest shipping complexes handling in excess of 17% of the UK's seaborne trade. The proportion passing through the Humber may well grow to 25% as the Humber becomes the main artery for rapid trade between mainland Europe and the UK. The size of vessels using the Humber is also set to increase and there is a need for this growth to occur without unacceptable environmental damage and with proper attention to flood defence.

Employment for large numbers of the local and wider populations relies on the industry and commercial activity on and related to the Estuary.

The Estuary is a major navigation in its own right with approximately 15,000 ship arrivals per year, however, navigation extends beyond the tidal reaches of the main rivers. Navigation is possible on the River Trent as far as Nottingham and on the Ouse beyond York, but for sea going vessels it is only as far as Gainsborough and Selby respectively. The length of commercial navigation is also extended by the system of inland canals.

The three major ports on the Humber are in Immingham, Hull and Grimsby whilst the smaller port of Goole is further upstream on the Ouse.

The catchment has a number of industrial developments which provide economic and commercial interests to the area, however, the large population associated with the urban and industrial development creates further pressures with demand for water based recreational facilities, both on the Estuary and in the immediate coastal area.

## DEFENCE AGAINST FLOODING

An area of some 800km<sup>2</sup> within the catchment lies below high spring tide level. Currently approximately 400,000 people live, and many more work in the flood plain behind the defences of the Humber Estuary and are therefore potentially at risk from tidal inundation. This area includes parts of Grimsby, Cleethorpes, Hull and Goole and the highly industrialised section along the south bank between East Halton and Grimsby plus high grade agricultural lands.

The NRA has a general supervisory role relating to all flood defence matters and a duty to carry out surveys to ascertain flood defence needs. These permissive powers, which are discretionary, are to maintain and improve existing defences and to construct new defences.

There are 24 Internal Drainage Boards whose districts border on to the Humber, Ouse and Trent within this Catchment Management Plan area. These bodies carry out local flood defence and land drainage activities including the management of a large number of outfalls into the tidal waters.

The existing defences in the Estuary vary widely in both their types and size. The smallest defences are relatively low earth banks. The most complex is the Hull Barrier which is lowered at times of high risk. Between these extremes the defences may incorporate revetment works to prevent erosion, armouring to resist wave attack and flood walls to give the required crest level. Much of the existing defences are fronted by mudflats and saltmarshes, some of which are designated as SSSI's, SPA's and RAMSAR sites. Any works to the defences must include due consideration of the effect upon these conservation areas.

All man-made structures need both maintenance and renewal and this is of particular importance in such a hostile environment as the Humber Estuary. The

defences are regularly inspected and maintained. Maintenance encompasses a range of activities from grass cutting and vermin control on the earth banks, and repairs to pitching on revetments, to the complex procedures necessary to maintain the Hull Barrier.

The defences which have been constructed to protect this area, are a mix of earth/clay banks and hard defences have been largely rebuilt since the 1953 tidal surge when an area over 35km<sup>2</sup> was flooded. The condition of many of the defences is now giving cause for concern, not only because of their age and condition which could lead to failure but also because of rising sea levels. This increases the potential for overtopping of the defences and accelerates the rate of deterioration. This scenario is further exacerbated by the changes in sedimentary processes which result in a net loss of material to the Estuary that would otherwise have built up and maintained beach and foreshore levels. Whilst recognising the urgent flood defence needs of the Estuary in a number of locations, the NRA is committed to consideration of all options and to taking into account the wider environmental implications of works. The Humber Estuary Tidal Defence Strategy will define the nature, extent and timing of the renewal of the defences in the Estuary.

The NRA operates a flood warning service whereby the Police and other organisations are advised in advance of areas likely to be affected by flooding. The warnings are phased and colour coded indicating the anticipated severity of an event and its likely impact on land and property.

The NRA provides an emergency work force capable of responding to emergency situations with a return period of up to 1 in 10 years. Plans exist to increase resources for more severe flood events.



*Hull Barrage*



## WATER QUALITY

The Humber Estuary, taken as a whole, is of good quality. It is also biologically healthy, with at least 180 species of invertebrates being recorded. The high silt content of the water results in layers of mud on the Estuary bed within which very high densities of individuals are found, up to 300,000 individuals/m<sup>2</sup>. This abundance is reflected in the number of predators which are found on the Estuary, notably birds and fish.

The water quality of the Humber Estuary is largely determined by the quality of the rivers draining into it via the Yorkshire Ouse and Trent system. The Trent input is of fair quality and meets its Non-Statutory River Quality Objective Standards, however the input from the Ouse system requires considerable improvement.

One of the main factors determining the current poor quality of the lower Ouse is low dissolved oxygen levels which have existed in the tidal Ouse for many years, largely due to the poor quality of effluent discharged from sewage treatment works on its tributaries, and the tidal River Ouse itself.

Industrial discharges to the tidal Ouse also contribute to the pollutant load on the river, however, over the last decade several significant improvements have been made to industrial discharges due to either the installation of on-site effluent treatment plants or the overall reduction in output of effluent.

The River Trent provides approximately 40% of the freshwater flow to the Humber Estuary. In the past, organic pollution from the Trent contributed to the depletion of dissolved oxygen in the Estuary. However, a steady increase in oxygen concentrations has occurred over the past 30 years reflecting the general improvement in the quality of the Trent with the removal of substantial pollution loads from sewage and industrial effluents.

The Humber is the biggest freshwater input to the North Sea from the English coast. In recent years there has been increasing concern about the North Sea, and in particular, the vulnerable shallow southern part to which the Humber discharges. In response to this concern, the UK Government has adopted a precautionary approach towards the discharge of certain particularly dangerous substances, the amounts of these substances which are discharged to the North Sea are to be reduced to at least half their 1985 level by 1995. In addition to contributing a substantial load of dangerous substances to the North Sea, the Humber Estuary also contributes a substantial nutrient load. Large amounts of nutrients in coastal waters can give rise to excessive growth of plankton, which as they die can be washed ashore as unpleasant scums, foams or mats of rotting vegetation. There are occasional "red tides" and similar plankton induced episodes, however, the nutrient input from the Humber to the North Sea is not believed to be a problem.



*Sea Vigil*

## SPORT AND RECREATION

Use of the Humber Estuary for sport and recreation remains comparatively undeveloped partly because waters are difficult for navigation as a result of shifting sand banks, high levels of commercial shipping and strong tidal currents.

Specific locations such as Cleethorpes Beach, the Humber Country Park, Humber Bridge and Spurn Head attract significant numbers of visitors. Sea angling by beach casting is common along both banks where access to the foreshore is comparatively easy. Quality coarse fishing takes place on the rivers, drains and streams entering the Estuary from both banks. In addition, the ponds and clay pits along the south bank are heavily fished for coarse fish.

Organised wildfowling takes place at a number of locations in the lower Estuary and in the upper reaches adjacent to the Wildfowl Refuge. Increasing use is made of the banks by horse-riders.

Informal walking and picnicking takes place but designated routes have also been set up particularly in the Humber Bridge Country Park as well as the Wolds/Viking Way. There are a number of public rights of way, however, access to some parts of the shore is poor.

Cruising in the Estuary and in the navigable lower sections of rivers entering into it is common, and inland water sailing takes place adjacent to the Estuary. Sea canoeing, surfing and marathon canoeing as well as coaching and training are common activities on the Estuary and on some adjoining rivers. Other waterborne activities are fairly restricted although water skiing, windsurfing and rowing also occur either within the Estuary or on adjacent inland waters. The Estuary is an established venue for power boat racing which is becoming increasingly popular, despite the harsh estuarine environment and lack of bankside facilities.



*Hull Marina*

## 5. RELATIONSHIP BETWEEN LAND USE AND WATER ENVIRONMENT

Land use planning plays a major role in the future development of a catchment and contributes to its current status and potential use. Although the NRA is able to influence some of the factors affecting the water environment, particularly in relation to the river corridor, it has very little control over the mechanisms which determine land use change on a catchment wide basis. This is largely the responsibility of local planning authorities through the implementation of the Town and Country Planning Acts.

The NRA encourages the adoption of policies which reflect its concern and responsibilities, commenting on development plans at a draft stage and liaising regularly with local planning authorities. The role planning authorities play in determining development of the built and rural environment and its subsequent impact on the water environment should not be understated.

The Humber Estuary has a diverse landscape with areas of industry and commerce centred around Hull, Grimsby and Immingham, for example areas of open mudflats designated as SPA's and SSSI's are especially valuable for conservation and in particular bird populations.

It is recognised by the NRA that to ensure the catchment's environmental as well as economic needs are taken into consideration, close liaison must exist between Catchment Planning and Development Planning in order that land use changes are in the best interests of all catchment users.

The NRA has produced a set of "Guidance Notes for Local Planning Authorities on the methods of protecting the water environment through Development Plans" to influence land use changes that are sympathetic to the targets we wish to meet

using the Catchment Management Planning process.

Further detailed guidance on areas of concern to the NRA are provided in for example, DoE Circular 30/92 "Development and Flood Risk" where a Memorandum of Understanding has been signed by the local authorities representative bodies and the NRA with regard to the scope and timing of providing floodplain maps. Without adequate consultation, there is an increased risk of inappropriate developments in the floodplain and similar areas of constraint. This circular and other Government policy guidance stresses the importance that Local Planning Authorities should attach to the NRA's advice.

Policies and guidance on land-use development are given in a hierarchy of documents prepared in accordance with the Town and Country Planning Act 1990. The Government Office issued the Consultation Draft for "Regional Planning Guidance" (RPG) for the Yorkshire and Humberside Region" in January 1995, and the final guidance is expected to be published in Summer 1995. The NRA's view is that RPG must emphasise the need for Local Authority Development Plans to take full account of the NRA's Catchment Management Plans.

At the strategic level, several Structure Plans and Unitary Development Plans are all moving towards adoption, and the NRA has suggested the inclusion of policies to protect and improve the water environment.

Development policies for specific sites, and for subjects like minerals and waste, are contained in about 20 Local Plans being produced by District and County Councils, and Doncaster MBC. The NRA has provided policy and supporting information for all of these Plans.



## 6. ACTIVITY PLANS

The Action Plan provides a planning framework to define both a strategy for future management of the catchment and a series of activity plans for the NRA, working with others to achieve the vision of the Humber Estuary Catchment.

These activity plans will form the basis for improvements to the water environment, outlining the areas of work and investment proposed by the NRA and other responsible parties over the next five years and beyond.

ABP	Associated British Ports	HEMS	Humber Estuary Management Strategy	LPA	Local Planning Authority
AWS	Anglian Water Services	HCC	Humberside County Council	MAFF	Ministry of Agriculture Fisheries and Food
CoCo	Countryside Commission	HMIP	Her Majesty's Inspectorate of Pollution	NFU	National Farmers' Union
CC	Crown Commissioners	HSE	Health and Safety Executive	PML	Plymouth Marine Laboratory
EH	English Heritage	IDB	Internal Drainage Board	RSPB	Royal Society for the Protection of Birds
EN	English Nature	JoNuS	Joint Nutrient Study	TBE	To Be Estimated
ETBPP	Environmental Technology Best Practice Programme	LA	Local Authority	WCO's	Water Companies
		LOIS	Land Ocean Interaction Study	YWS	Yorkshire Water Services

## ISSUE 1 AND 2

To develop and apply a methodology to set Minimum Residual Flows to the Estuary for the Trent and Ouse which balance all water users.

### BACKGROUND

Two issues relating to minimum residual flow (MRF) were identified in the Consultation Report. It is now considered more appropriate to consider these issues jointly. A minimum residual flow (MRF) to the tide is required so that the right balance can be struck between the needs of abstractors on tidal rivers feeding the Estuary and other users, and those of the environment. A MRF is a target flow, rather than a flow that would be maintained by the NRA or any other organisation. As yet no standard methodology exists for the setting of an MRF. The new abstraction licences from the Trent Estuary are being granted with a time-limit pending further investigations of a MRF.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £k
		LEAD	OTHER							
To develop and apply methodology to set a MRF for the Trent and Ouse to the Humber Estuary.	R & D project on MRF methodology.	NRA		■						2k <sup>(1)</sup>
	Agree methodology.	NRA	Users	■	■					15k
	Regional MRF implementation and development.	NRA				■	■			60k
	Apply MRF	NRA						■		5k

<sup>(1)</sup> Project completion costs only.

### EFFECTS

- There will be an agreed framework within which conflicting flow requirements can be resolved.
- Once a MRF has been defined, new abstraction licences can be granted with constraints that will have regard to existing estuary uses.

The level of accuracy of gauging of freshwater flows to the Estuary needs to be improved.

## BACKGROUND

The level of accuracy of gauging freshwater flows on the Yorkshire Ouse and its tributaries is satisfactory. However, calculation of flows to the Estuary as a whole is made difficult by the absence of gauged information on the Trent. This problem is most significant at low flows and leads to inadequate knowledge on which to base decisions for managing water resources.

The flow gauge at North Muskham, on the Trent, will be upgraded from an open channel section rating to an ultrasonic flow gauge. The design has already been completed. The timescale of building depends upon the availability of funds from the Regional water resources capital programme.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
To improve flow gauging accuracy at North Muskham.	Build ultrasonic flow gauge at North Muskham.	NRA								167k

## EFFECTS

- Improved accuracy of flow measurement.
- Improved control of abstractions under licences with flow restrictions.

Water quality of the tidal Ouse requires improvements.

## BACKGROUND

The tidal Ouse runs from Naburn Weir to Trent Falls. Improvements in effluent quality from sewage treatment works are required to help achieve River Quality Objectives (RQOs). A number of trade effluent improvements are sought to reduce further the organic pollution on this tidal river.

The NRA is investigating the possibility of increasing river flows by restriction of abstractions. This is considered, at best, to be only a partial solution to improving poor water quality in the tidal Ouse.

It should be noted that the Ouse upstream of Boothferry Bridge is within the area of the Swale, Ure and Ouse Catchment Management Plan.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Improve Water Quality on the tidal Ouse to meet RQO's.	Improve effluent treatment scheduled under UWWTD for Selby and Goole STW's.	YWS	NRA	■	■	■	■	■	By 2005	(1)
	Improve water quality of Aire, Calder, Don, Rother and Dearne catchments (see relevant CMP).	YWS	NRA						By 2005	(1)
	Encourage industry to adopt waste minimisation principles.	Industry	Sponsors including Humber Forum Ltd, NRA and ETBPP	■	■	■	■	■	■	(2)
Improve industrial effluent discharge required under UWWTD.	Achieve a reduction in organic pollution discharged to the tidal Ouse by a programme of consent review and treatment improvements at a number of trade premises in the Selby area including Haarman & Reimer Ltd, Hazelwood Foods and BOCM Pauls (refer to Swale, Ure and Ouse CMP).	NRA	Industry	■	■	■	■			(1)

(1) YWS and Industry costs are confidential.

(2) See explanation provided in Issue 6

## EFFECTS

- Improvements to the industrial discharges and sewage effluents (including those discharged to the inland rivers) will improve the water quality in the tidal Ouse.
- The long standing problem of severe depletion in dissolved oxygen in the tidal Ouse will be reduced. A steady improvement in dissolved oxygen concentration of the tidal River Trent and Humber has occurred during the past 30 years. These improvements will be sustained until the RQO is attained.
- A mathematical model incorporating the beneficial impacts of the above measures predicts that river quality will improve in the tidal Ouse.
- Modelling tests so far have indicated that significant increases in the rivers base flow will only bring about marginal improvement in water quality in the tidal Ouse.



Cleethorpes bathing water fails to comply with the European Bathing Water Directive.

## BACKGROUND

The EC Bathing Water Directive (76/160/EEC) is relevant to standards in the Humber Estuary at Cleethorpes. This Directive lays down microbiological standards for bathing waters, principally in terms of total and faecal coliform levels. The waters at Cleethorpes do not comply with the mandatory standards but full compliance is expected to be achieved in the 1995 bathing season ie. May to September inclusive, as a result of major improvements to the sewerage system and the provision of sewage treatment, carried out by Anglian Water Services Ltd (AWS).

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Improve bathing water quality at Cleethorpes.	Improve the sewerage system and provide a sewage treatment works for Cleethorpes.	AWS	NRA	■						50M
	Continue monitoring and publish results.	NRA	Local Authority	■	■	■	■	■	■	2k p.a.

## EFFECTS

- Improvements to the sewerage system will largely prevent the discharge of crude sewage to the beach in times of emergency ie. mechanical or electrical breakdown of equipment or storm conditions.
- Sewage effluent from the new treatment works will receive full treatment for all the year and ultra-violet disinfection during the bathing season.
- A mathematical model incorporating the beneficial impacts of the above measures predicts that Cleethorpes bathing water will comply with the above Directive.
- Satisfactory bathing water quality should have a positive impact on the local tourist industry.

Every opportunity should be taken to reduce the discharge of Dangerous Substances to the water environment. These substances may find their way into the food chain within the Estuary and the North Sea.

### BACKGROUND

#### Environmental Quality Standards (EQS's)

A comprehensive list of EQS's was provided in Section 3.2 of the Consultation Document. Standards are based on the best scientific information available or where applicable, on mandatory limits specified by either the European Community or UK legislation. Thus the limits set for mercury, cadmium and the organic compounds are based on Statutory Water Quality Objectives laid down in 1989 regulations and the list for the remaining metals are National Environmental Quality Standards as required by the EC Dangerous Substances Directive. It should be noted that research has shown that copper is present as an "organic complex" in the Humber Estuary. Since this form of copper is less toxic than its inorganic form, a higher value for total copper is allowable in the Estuary.

The Estuary currently complies with all of its EQS's. Nevertheless, since dangerous substances are those which are the most toxic to, and persistent in the environment, the precautionary principle suggests that both regulators and industry should work together to reduce these substances in the environment to the lowest levels practicable.

#### Controls

As well as the EC Dangerous Substances Directive which controls both List I and List II Substances, in 1989 following the Second North Sea Conference, the Government issued its "Red List" of Dangerous Substances and proposed an integration of the United Kingdom's Environmental Quality Objectives (EQO's)/EQS's approach to discharge control with the uniform emission standards approach which is adapted in most other EC Countries.

The UK "Red List" has now been largely overtaken by the controls introduced under Part 1 of the Environmental Protection Act 1990. The Best Available Techniques Not Entailing Excessive Costs (BATNEEC) controls were introduced as part of a system of integrated pollution control (IPC) designed to develop an approach to pollution control which considers discharges to all media - air, water and land - in the context of the effect on the environment as a whole; this is known as the "best practical environmental option" (BPEO). Under the EPA 1990, Her Majesty's Inspectorate of Pollution (HMIP) are the Authority responsible for enforcing IPC; however, the NRA is a statutory consultee with respect to all processes which involve releases into controlled waters, including the Humber Estuary.

Following the Third North Sea Conference in 1990, a further list of some 36 substances including those on the "Red List" were designated as priority hazardous substances. The Conference included an agreement to reduce by 50% or more the discharge of these substances to the North Sea via rivers and estuaries between the years of 1985 and 1995. For dioxins, lead, cadmium and mercury, reductions of the order of 70% were agreed where available by BATNEEC. The Third North Sea Conference also agreed common action to reduce specific groups of substances; thus specific pesticides and polychlorinated biphenols (PCBs) must be strictly controlled or phased out altogether.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Reduce the discharge of Dangerous Substances to the water environment.	Implement IPC by authorising processes prescribed under the Environmental Protection Act 1990.	HMIP Industry	NRA	■	■	■	■	■	■	100M
	Encourage Industry to adopt waste minimisation principles.	Industry	Sponsors including Humber Forum Ltd, NRA and ETBPP	■	■	■	■	■	■	(1)

<sup>(1)</sup> Substantial savings have been made by industry in other areas by adopting waste minimisation procedures.

## EFFECTS

- Waste Minimisation Programmes aim to:
  1. Reduce demand for water by industry (and consumption of energy and other materials);
  2. Reduce production of process effluents (and other wastes);
  3. Reduce the risk of pollution incidents from accidents, leaks and spillages on site;
  4. Reduce company costs both in terms of raw materials and treatment charges.
- Application of BPEO will reduce the discharge of dangerous substances to the environment as a whole;
- Application of BATNEEC will ensure that the best practicable technological solution to reduce the dangerous substances concentration in waste streams, is utilised.



Data are required to assess the eutrophic status of the Humber Estuary and its adjacent coastal water for Urban Wastewater Treatment Directive and North Sea Declaration purposes.

### BACKGROUND

The EC Directive on Urban Wastewater Treatment (91/271/EEC) sets standards for the treatment of all municipal sewage discharges to fresh, estuarine and coastal waters. The level of treatment to be provided depends on the size/population equivalent (PE) of the discharge; the type of water into which the discharge is made (in the case of this Plan either an estuary or a coastal water) and the sensitivity of the water (this is discussed further below). The effect of this Directive on the Humber Estuary will be significant in future years and will require several discharges to be substantially improved.

Member States are required to establish the outer (seaward) limits of estuaries for the purpose of this Directive. In the case of the Humber, the UK has decided to draw this line at the Humber Bridge; the Lower Humber is therefore a coastal water as far as this Directive is concerned. This has the effect of requiring "appropriate" treatment of sewage discharges with a PE between 2,000 and 10,000. All other sewage discharges must be treated to a standard required by the Directive.

Member States have to categorise waters to ensure discharges receive the correct level of treatment. All sewage discharges above 2,000 PE to estuaries or above 10,000 to coastal waters must receive secondary treatment unless they are made to either:

- A sensitive area where there is evidence of eutrophication. Here the discharge must receive tertiary treatment to remove nutrients, or,
- A High Natural Dispersion Area (HNDA) where there is a good water exchange and no dissolved oxygen depletion or eutrophication. Here the discharge must receive a minimum of primary treatment.

The Humber Estuary, together with the tidal Yorkshire Ouse up to the freshwater limit (Boothferry Bridge), have been designated as HNDAs. The Directive requires sensitive areas and HNDAs to be reviewed at intervals of not more than four years. Consequently there is a continuing need for monitoring to appraise these designations.

Discharges to HNDAs are subject to comprehensive studies to demonstrate these discharges would not adversely affect the environment. If the comprehensive studies indicate an adverse effect the NRA will not certify the discharge from primary treatment.

The Final Declaration of the Third International Conference on the Protection of the North Sea agreed that further measures are required to meet the aim of a reduction of the order of 50% for inputs of nutrients between 1985 and 1995 into areas *where these inputs are likely to cause pollution*. There is no evidence that eutrophication is a problem in the coastal waters adjacent to the Humber Estuary and therefore no such areas have been identified by the British Government. Again more data are required to appraise this matter.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £k
		LEAD	OTHER							
Reassess the Estuary with effect to its status under the UWWT Directive and the Third North Sea Conference.	Continue existing monitoring for three more years and use all data readily available from NRA, MAFF (JoNuS Project), PML (LOIS Project) and "comprehensive studies" undertaken by dischargers.	NRA  WCo's Industry	MAFF PML  NRA	■	■	■				50k

### EFFECTS OF THE ABOVE DESIGNATIONS

- Full treatment will be required of a number of large discharges in the tidal Ouse which do not qualify for primary treatment only eg. Selby and Goole. A number of industrial discharges of similar nature and size will also require higher levels of treatment.
- Large discharges (>10,000PE) downstream of the bridge, eg. Hull, Immingham and Grimsby will require primary treatment significantly reducing the pollution load from these discharges and removing the aesthetic pollution caused by the discharge of crude sewage.
- New Holland, (<10,000PE) which is downstream of the Bridge will require "appropriate" treatment.

If the data to be collected show that there is a problem with either eutrophication or the comprehensive studies show that there are detrimental environmental effects caused by the discharges, then the relevant discharges will have to be provided with enhanced treatment.

Different standards of flood protection are ascribed to adjacent lengths of flood defence because the responsibility for flood defences rests with a number of organisations.

## BACKGROUND

Responsibility for providing and maintaining flood defences on the Estuary rests with a variety of individuals and organisations. These include NRA, which has permissive powers to carry out works, Crown Commissioners, Local Authorities, Associated British Ports and riparian land owners. This complexity of ownership and responsibility means that no single body has direct control over the entire flood defences of the Estuary. There is therefore a risk of inconsistent and inadequate standards of protection being provided.

## EXAMPLES:

- Grimsby, Immingham, Hull Port - ABP
- Sunk Island - Crown Commissioners

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Ensure consistency of standards in the provision of estuary flood defences. Works to be developed through the Humber Estuary Tidal Defence Strategy and Sector Strategies.	Encourage joint commitment from all parties responsible for providing and maintaining estuary flood defences by initiating a pro-active approach to liaison.	NRA	Local Authorities ABP Riparian Owners	■	■	■	■	■	■	15k pa <sup>(1)</sup>
	This is to be achieved through focusing terms of reference of existing groups on a timescale consistent with the production of the Humber Estuary Management Strategy.  NRA will act to provide appropriate standards subject to justification, by use of permissive powers.	NRA	MAFF	■	■	■	■	■	■	5k pa <sup>(2)</sup>

<sup>(1)</sup> NRA Admin Costs

<sup>(2)</sup> NRA Costs in developing and maintaining strategies. See Issues 9 & 10 for capital costs.

## EFFECTS

- Decreased risk of flooding through the use of appropriate design standards.



- a) The structural integrity of the flood defences is diminishing as they reach the end of their useful life.
- b) Existing flood defence standards are being reduced by rising sea levels increasing the frequency at which they will be overtopped and breached.
- c) Flood defences are threatened by increased wave attack brought about by the erosion of the foreshore.

### BACKGROUND

Most of the defences were built following the 1953 flood event. They are now approaching the end of their effective life. The rate of damage and deterioration is now accelerating.

The long term trend of rising sea levels relative to land levels is set to accelerate due to the combined effects of global warming and sinking land levels. This combination is gradually lowering the existing standard of defence and increasing flood risk.

As water levels rise this leads to a threat to the inter-tidal mud flat and marsh areas fronting the defences.

This threat results from both the simple drowning of the inter-tidal areas due to sea level rise together with lowering of the foreshore by erosion due to increased wave energy. The combined effect will be a loss of inter-tidal area.

The loss of this area will result in increased wave height and wave energy acting on the defences leading to accelerated wear and tear and increasing the risk of overtopping and failure.

Identification of urgent works and development of long term flood defence needs will be achieved through strategies for the Humber Estuary tidal defences.

Evaluation of defence options through re-alignment and improvement on-line will be undertaken.

The NRA does not have a duty to maintain and build flood defences but exercises its permissive powers for the good of the community.

### EXAMPLES:

- Barton to Grimsby
- Hull
- Goole
- Alkborough Flats

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Provide appropriate long term effective and sustainable tidal defences for the Estuary.	Prepare strategy and update as required.	NRA	MAFF EH EN CC	■	■	■	■	■		incl
	Develop geomorphological tool.	NRA		Included in Issues 11 & 12						
	Prepare Sector Strategies.	NRA	EN CC	■	■	■	■	■		incl
Identify works required to high risk flood areas.	Hull City Frontages.	NRA	MAFF EN		■	■	■	■		10.6M <sup>(1)</sup>
	Salt End to Paull.	NRA	MAFF EN	■	■	■				8.0M <sup>(1)</sup>
	Thorngumbald.	NRA	MAFF EN		■	■				1.7M <sup>(1)</sup>
	Kilsey, Welwick, Paull Holme.	NRA	MAFF EN			■	■	■	■	2.6M <sup>(1)</sup>
	Brough to Crabley.	NRA	MAFF EN				■	■		2.5M <sup>(1)</sup>
	Goole Docks.	NRA	MAFF EN	■						0.7M <sup>(1)</sup>
	Old Goole, Goole Hill, Reedness.	NRA	MAFF EN		■	■	■	■	■	2.5M <sup>(1)</sup>
	Immingham, East Halton, New Holland, Winterringham, Witton.	NRA	MAFF EN	■	■					2.3M <sup>(1)</sup>
	Pyewipe, Stallingborough, Killingholme, Goxhill, Chowderness, South Ferriby.	NRA	MAFF EN			■	■	■		1.7M <sup>(1)</sup>
	Maintain defences where appropriate.	NRA	EN	■	■	■	■	■		

<sup>(1)</sup>The costs shown are drawn from the three Region's Flood Defence Committee's long term financial planning documents. The locations have been identified as significant flood defence risk areas relating to the level or condition of the existing defences. The inclusion of these costs does not indicate a commitment to carry out works. All options will be considered.

## EFFECTS

- An area of 800km<sup>2</sup>, 400,000 people and their property will be provided with appropriate defences.
- Loss of inter-tidal areas will be minimised.

## ISSUES 11 AND 12

It is believed that there is now a nett loss of sediment from the Estuary which has an adverse effect upon foreshore levels.

Increased understanding of the processes would enable appropriate decision making.

### BACKGROUND

Studies suggest that natural and other processes going on within the Estuary are causing a loss of sediment. Coastal erosion on the Holderness coast is believed to be one of a number of sources of supply of sediment to the Estuary. Surveys indicate that the inter-tidal areas in parts of the Estuary have diminished. Records over the past 60 years show that sea levels in the Estuary have risen by some 215 millimetres.

A nett loss of sediment from the Estuary would lead to a reduction of inter-tidal areas, lessening the environmental value of the area. Also, increased wave action on flood defences would reduce their effectiveness. The situation could be compounded by sea level rise and coastal protection on the Holderness coast.

The overall effects of sedimentary processes, freshwater flows, rising sea levels, dredging activities and the constraining of the Estuary and coastal boundaries needs to be determined.

Example:

- Lowering of foreshore between Immingham Docks and East Halton Skitter.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Increase knowledge of the problem and the processes which characterise this area to enable improvements in the decision making process.	Initiate a geomorphological study of the Estuary;	NRA								
	Stage I: Feasibility			■						40k
	Stage II: Prep Studies				■					200k
	Stage III: Development of geomorphological tools.					■	■	■	■	1.3M
Provide consistency between strategies within the Estuary and adjacent coast to ensure a holistic approach.	Develop and maintain a robust consultation process to enable an integrated approach between the Humber Estuary Tidal Defence Strategy, Shoreline Management Plan and Humber Estuary Management Strategy.	NRA Holderness Borough Council HEMS	MAFF Local Authorities	■	■	■	■	■	■	10k pa

### EFFECTS

An improved understanding of erosion and sedimentary processes to enable the provision of effective environmental and environmentally compatible defences.



## ISSUE 13

Development and upgrading of land behind the defences may be inappropriate for the current level of protection afforded.

### BACKGROUND

As flood defences have been constructed along the Estuary, industrial and residential development has expanded in areas which were previously floodplain. The standards of defence have not necessarily been commensurate with the nature or degree of this development.

Further pressure to extend development in the natural floodplain has increased as the availability of other sources of land for development has reduced.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Discourage inappropriate development in high risk areas.	Liaise with Planning Authorities to ensure there is consistency between Development Plans and Catchment Management Plans.	NRA LPA's		■	■	■	■	■	■	85k pa <sup>(1)</sup>
	Take appropriate action through development control procedures.	NRA LPA's	Developers	■	■	■	■	■	■	inc. in above
Ensure standards of defence are consistent with new development needs in areas defined as appropriate by Development Plans.	Consider new developments within the framework of the Humber Estuary Tidal Defence Strategy and Sector Strategies seeking contributions from developers as necessary.	NRA Developers	Local Authorities	■	■	■	■	■	■	Indeterminate
	Require developers to provide appropriate standard of defence where NRA have no schemes planned.	Developers	NRA Local Authorities	■	■	■	■	■	■	TBE

<sup>(1)</sup> NRA development control costs.

### EFFECTS

Level of protection provided appropriate to existing and future land use.

Opportunities exist to improve the conservation status of the Estuary.

## BACKGROUND

Opportunities to enhance the conservation status of the Estuary are closely linked with the Humber Tidal Defence Strategy. The requirement to provide flood defences which are technically sound, economically worthwhile and environmentally acceptable provides a range of options for enhancement. Since the Strategy provides an estuary wide approach it is appropriate that a similar one is adopted for conservation improvements. The life time of the strategy is such that some improvements will take a number of years to develop. However, it will still be possible to undertake local, often collaborative, initiatives as opportunities arise.

An important element of the work will be to ensure that it is possible to demonstrate the success of the conservation enhancement. Therefore it will be necessary to carry out baseline surveys of the conservation status against which future changes can be assessed.

## EXAMPLE:

- Barton Clay Pits, Blacktoft.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Assess the most effective and appropriate means of creating inter-tidal habitat by local managed retreat.	Agree site for Pilot scheme.	NRA MAFF EN RSPB Local Authorities			■	■				TBE
	Establish baseline and continued monitoring.	NRA MAFF EN RSPB Local Authorities Landowners NFU			■	■	■	■	■	TBE
Explore the opportunities for increasing the area of inter-tidal wetlands through take up of appropriate grant aided schemes.	Liaise with interested parties promoting organisations to exploit opportunities.	HEMS Wildlife Trusts MAFF RSPB EN Local Authority			■	■	■	■	■	TBE
	Carry out local initiatives to create and improve wetland habitats as opportunities arise.									
Assess the current landscape features of the Estuary. ●	Set up a study for landscape assessment.	NRA MAFF Local Authority HEMS	CoCo		■	■				25k NRA

- Activity added as a result of consultation.

## EFFECT

Improved conservation status of the Estuary.

Silt build up in havens inhibits land drainage and restricts access to recreational craft .

## BACKGROUND

There are a number of drains and channels entering the Estuary which are operated by gravity on the tidal cycle and their ability to discharge will be impaired by rising tide levels, with a consequent impact on upstream water levels. The outfall areas are sometimes used as safe havens by recreational craft. Silt build up in these havens affects the ability of the land drains to discharge and restricts access for craft.

## EXAMPLE:

- Hedon, Brough, East Halton Skitter, Winteringham.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Adopt an integrated approach to ensure adequate channel and haven capacity.	Review current land drainage practices and develop appropriate options to overcome.	NRA	IDB MAFF		■	■	■	■	■	15k
	Consider and take account of all users needs when considering appropriate options.	NRA	IDB Recreation users		■	■	■	■	■	TBE

## EFFECTS

Improved land drainage and access for craft.



## ISSUE 16(a) - Issue added as a result of consultation.

The significant archaeological resource of the Humber Wetlands is at risk from development and realignment of flood defences.

### BACKGROUND

The archaeological potential of the Humber is considerable both to seaward and landward. It is recognised that the number of recorded archaeological sites and finds does not represent what might be expected if systematic field work was undertaken; even then unexpected discoveries could still be made. Development and realignment of flood defences could cause damage to both known and as yet unknown archaeological sites.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Protect and conserve important archaeological sites.	Identify archaeological sites and validate their importance.	Local Authorities EH		■	■	■	■	■	■	TBE
	Local Authorities to control development and other activities in high risk areas.	Local Authority	Developers Archaeological interests NFU							TBE
NRA to protect and conserve archaeological sites in carrying out its duties.	Early consultation between Local Authority and NRA.	NRA Local Authority	EH	■	■	■	■	■	■	TBE
	Carry out assessment of whether proposals are likely to contain an archaeological site.	NRA Local Authority	EH							
	Consider appropriate mitigation measures.	NRA Local Authority	EH							TBE
	Monitor work in progress to provide additional information as work progresses.	NRA Local Authority	EH							TBE

### EFFECTS

Protection and conservation of sites of archaeological interest.

## ISSUE 16(b) - Issue added as a result of consultation.

Humber Wetlands have been afforded greater protection recently, but are potentially still at risk from development.

### BACKGROUND

Although the designation of part of the Humber as an SPA (Special Protection Area) offers a degree of protection to wetlands, there are areas of wetland outside the SPA which are vulnerable as areas for development. The loss of parts of Humber wetlands could result in loss of habitat which could affect the conservation value of the Estuary.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Maintain and conserve existing wetland areas within the area designated as SPA's	Liaise with local authorities to discourage development of important wetland areas.	Local Authorities	EN NRA RSPB Developers Owners	■	■	■	■	■	■	(1)
Discourage development of wetlands outside areas designated as SPA's.	Liaise with developers and local authorities to discuss proposals and encourage alternative proposals.	Local Authorities EN Developers Owners	NRA	■	■	■	■	■	■	(2)

<sup>(1)</sup> Planning Liaison costs of NRA and LPA's are internal costs.

<sup>(2)</sup> Cost to developers of protecting or enhancing the water environment may be positive (cost) neutral or negative (saving) and are difficult to quantify in the context of this issue.

### EFFECT

The protection and conservation of wetland habitats.

## ISSUE 17

Managed exploitation of shrimp, shellfish and lugworm would allow sustainable development and protect natural predators eg. birds and fish.

Responses by the consultees, particularly those identified with responsibility, did not confirm that this was an issue or that they had a role to play in pursuing the issue. It has, therefore, not been identified as a priority at this stage and no actions are proposed at this time, although the NRA monitoring programme will be maintained in the Estuary.

Shellfish harvested from three designated areas under the EC Shellfish Hygiene Directive, require treatment prior to human consumption due to contamination by bacteria.

## BACKGROUND

The EC Shellfish Hygiene Directive lays down microbiological standards for shellfish particularly in terms of total and faecal coliform levels. Responsibility for monitoring lies with the Environmental Health Department of the Local Authority who pass the result to MAFF who act as co-ordinators and hold a database of results. The suitability for consumption is assessed on a classification scheme; Class A can be harvested for direct human consumption; Class B require purification and Class C require transplanting to an approved area for at least two months. The current classification of the shellfisheries are given below.

Three commercial shellfisheries have been designated by MAFF under the EC Shellfish Hygiene Directive; these are Wonderland - mussels (Class C), Yacht Club - Cockles (Class C) and Horseshoe Point - Cockles (Class B). A fourth area at Anthony's Bank, off Humberstone, is currently declassified due to over-exploitation. No part of the plan area is designated under the EC Shellfish Water Directive.

The guidelines associated with the second Asset Management Plan for the Water Industry issued by the DoE indicate that The Shellfish Hygiene Directive should not be a determining factor in the context of discharge improvement/relocation. However, it is likely that the shellfisheries will be improved as a consequence of improvements made to discharges under other legislation (1) eg. EC Bathing Water Directive, Urban Waste Water Treatment Directive, the Environmental Protection Act.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Improve suitability of shellfish for human consumption	Research/monitor.	Env. Health	MAFF	■	■	■	■	■	■	1.6k
	Improve water quality.	WCo's Industry	NRA	■	■	■	■	■	■	100M

## EFFECTS

- Continued monitoring will give an indication of any deterioration/improvement in the quality of the Shellfish. The general trend of improved water quality within the Humber system should aid improvement.
- Research may be necessary to assess further what levels of particular contaminants are suitable for consumption. These findings could be used to update and improve the current classification scheme.



## ISSUE 19

Flounder populations have declined on watercourses where free access from the Estuary has been restricted.

### BACKGROUND

A number of watercourses and drains flowing into the Humber supported significant flounder fisheries. In some cases these were very popular with local fishermen. Changes in outfalls, particularly the installation of sluices and valves have prevented free access for flounders and resulted in a loss of amenity. This issue is of local significance on the north bank of the Estuary and is a relatively small one for the Estuary as a whole.

### EXAMPLES:

- Winestead Drain, Keyingham Drain/Stone Creek, Crabley Beck System

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Restore the flounder fishery in watercourses and drains entering the Humber.	Investigate the nature of obstructions and recommend potential ways to restore free passage.	NRA		■						5k
	Implement recommendations.	NRA IDB's		■	■	■	■	■	■	TBE

### EFFECT

Allow free access for flounders.

## ISSUE 20

Insufficient information exists on fish species in tidal rivers and the Humber Estuary.

MAFF is the lead organisation for this issue and are satisfied that sufficient information exists. Since survey work by MAFF and NRA already takes place in the Estuary as a continuing and ongoing activity it is not considered that further actions are required.

The run of migratory salmon through the Humber Estuary has declined since the 19th Century.

## BACKGROUND

Salmonids have been observed within the Estuary and in the Ouse, Wharfe and Trent Catchments, however there is no indication of stocks significantly improving and no commercial fishery exists. There is potential for these rivers to develop self sustaining salmonid populations but the dissolved oxygen depletion at Trent Falls, localised elevated water temperature and substantial physical barriers in the freshwater system restrict migration. In addition, since salmon complete their life cycle in freshwater then other factors eg. suitability of spawning areas will need to be considered in the Catchment Management Plans of the relevant rivers entering the Estuary.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Improve water quality (Trent Falls and Lower River Ouse).	Improve quality of discharges.	NRA Effluent Dischargers		■	■	■	■	■	■	(1)
Provide free passage to migratory fish.	Undertake study of physical barriers.	NRA		■						15k
	Adopt an opportunistic approach to the provision of free passage as opportunities arise.			■	■	■	■	■	■	TBE
Control exploitation via Net Limitation Order or byelaw.	Introduce NLO covering the Humber.	MAFF NRA							■	TBE

(1) See Issue 4.

## EFFECTS

A run of migratory salmon will demonstrate an improvement in water quality of the Estuary and create new fisheries.

## ISSUE 22

The recreational potential of the Estuary is not fully developed.

### SUB ISSUE 1

A co-ordinated strategy for the managed development of recreational uses within the Estuary is required.

### BACKGROUND

The use of the Humber Estuary for recreational pursuits remains undeveloped. The Estuary is a commercial navigation used by large and small vessels but the harsh estuarine environment and lack of bankside facilities does not encourage water activities such as power boating or sailing. In addition there is also a range of land based recreation such as bird watching, walking and wildfowling. There is potential for conflict between these uses and for disturbance or damage to sensitive sites.

### EXAMPLES:

- NRA provision of car park, boat facilities and toilets at South Ferriby.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Produce a co-ordinated recreation strategy.	Contribute to HEMS. Implement strategy through planning process.	HEMS  Local Authorities	NRA Sports Council Local Authorities CoCo ABP Sport/ Recreation Associations	■	■	■				TBE
Develop a management strategy to take account of conflicts.	Support and input to HEMS.	HEMS	NRA Sports Council Local Authorities CoCo ABP Sport/ Recreation Associations	■	■	■				TBE

### EFFECTS

A strategy would encourage strategic and managed development of recreational facilities along the Estuary and would help in reducing and resolving conflict situations for the benefit of all recreational users.



## SUB ISSUE 2

Access is restricted on some embankments particularly to disabled persons.

### BACKGROUND

The use of floodbank embankments as recreational routes is developed in some parts of the Estuary. A number of designated routes exist, and there are informal routes over other sections. There are, however, sections which are unsuitable for use by disabled persons. The NRA own some sections of bank but most is in private ownership.

### EXAMPLE:

- NRA currently working on disabled access points on floodbanks on the north banks of the Estuary as part of Heritage coast works.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Maximise the opportunities and potential for improving access and existing facilities on NRA land particularly for disabled persons.	Produce management plans for NRA owned banks.	NRA	Local Authorities	■	■					20k
	Maintain and improve car parks, footpaths and other recreational facilities or provide where appropriate.	NRA			■	■				TBE
Improve access on non NRA owned land.	Encourage landowners to allow access using countryside stewardship schemes.	CoCo	Local Authorities Owners/ Occupiers	■	■	■	■	■	■	TBE

### EFFECTS

Improvement of access, including for disabled persons, to the Humber Estuary.

## ISSUE 23

The educational value of the Estuary has significant potential for future development.

### BACKGROUND

An understanding of the Estuary and its processes are necessary to recognise the importance of the Estuary and to ensure its protection and enhancement. The area has a high population and attracts many visitors to specific locations and for its important water and wildfowl numbers and the spectacular "geography" of Spurn Head. There is scope for increased appreciation and knowledge of the local environment to explain the importance of the Estuary and its surroundings to visitors.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Strengthen links with educational establishments.	Provide data and information for analysis and feedback.	NRA Universities Schools		■	■	■	■	■	■	TBE
Increase awareness of the Estuary.	Publish leaflets and brochures.	NRA	Industry EN	■	■	■	■	■	■	TBE
Increase liaison with organisations to strengthen the educational value of the Estuary.	Report and promote on work and activities taking place within the Estuary.	NRA Universities HCC	Industry EN	■	■	■	■	■	■	TBE
	Review and update NRA PR material.	NRA	Industry EN	■	■	■	■	■	■	TBE
	Use of roadshows and exhibition material.	NRA Universities HCC	Industry EN	■	■	■	■	■	■	TBE
	Contribute to HEMS.	HEMS	Industry	■	■	■	■	■	■	TBE

### EFFECT

Appreciation of the environmental importance and the educational value of the Estuary further developed.

## ISSUE 24

Enforcement of the Commercial Eel Fishery is not consistent.

### BACKGROUND

Eels occur throughout the Estuary. Commercial fishing takes place mainly between April and October. Licences are issued to fishermen on the north bank and for the Tidal Trent but not on most of the south bank. There was some support for the development of a consistent approach to enforcement.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Develop a consistent approach to enforcement.	Review the situation and assess the implications in light of national policy development.	NRA				■	■			TBE

### EFFECTS

A consistent approach throughout the Estuary to the management of fish stocks and enforcement.

The potential to reclaim land along the Estuary poses a threat to its flora and fauna.

## BACKGROUND

There have been some ambitious proposals in the recent past for land reclamation, but these have now largely ceased. The designation of a large part of the Estuary as a Special Protection Area (SPA) under the EU Birds Directive gives a special reason not to reclaim land from the Estuary. The future trend will be to preserve the status quo, or even to allow some areas to return to mud-flats, etc. Habitats, especially in the parts of the Estuary which are not a SPA, are at risk, and the diversity and numbers of species could be reduced. Reclaimed areas represent a loss of flood storage and possibly a narrowing of the Estuary, leading to changes to siltation and erosion characteristics. Critical tide levels could also be enhanced leading to increased risk of flooding of protected land. The NRA's presumption against reclamation is consistent with the LPA's land-use policies, but these need to be kept under review in the light of the balance between commercial and environmental pressures. Economic development, which will not affect the SPA, need not be frustrated by limits on land reclamation. Proposals in the SPA would be resisted, and in any case would need an environmental assessment.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Discourage land reclamation.	Liaise with Local Planning Authorities to monitor and discuss proposals for land reclamation.	NRA LPA's	EN	■	■	■	■	■	■	NRA & LPA internal costs. <sup>(1)</sup>

<sup>(1)</sup> No additional costs to NRA or LPAs are foreseen for this action; any study or investigation required as part of monitoring and assessment could have a cost.

## EFFECTS

The threat to flora and fauna by land reclamation will be minimised.



Development on areas of contaminated land has the potential to pollute, but provides opportunities to clean up existing problems.

## BACKGROUND

The NRA favours the beneficial re-use of contaminated land in preference to the development of greenfield sites, provided that pollution is not caused.

Many sites have been cleaned up with the help of derelict land grants, but serious problems are experienced with "orphan" sites where the owner is not known, or the resale value of the cleaned-up site is less than probable remediation costs.

The Environment Bill now before Parliament contains new proposals for the management and clean-up of contaminated land and closed landfill sites. Responsibilities may be shared by local authorities and the new Environment Agency. The NRA is supporting proposals for designation of high risk sites and remediation procedures. Remediation may well be related to the proposed new use, on a "fitness for purpose" basis.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Prevent the pollution of surface water and groundwater from contaminated land and closed landfill sites, whilst encouraging the re-use of such land.	Negotiate with and persuade LPA's and developers to ensure pollutants are removed from site, neutralised or effectively contained.	NRA LPA's	Developers	■	■	■	■	■	■	(1)
	Continue to lobby Government for effective legal controls and arrangements.	NRA Local Authorities		■	■	■	■	■	■	(1)

<sup>(1)</sup> Costs are internal costs for relevant organisations; remediation costs borne by developers may reach £ millions, but are not quoted here, since they are either unknown or commercially confidential.

## EFFECTS

The NRA will liaise with Local Planning Authorities and developers to ensure appropriate removal, neutralisation or containment measures are adopted to ensure that disturbance does not lead to re-mobilisation of pollutants. Without redevelopment of the land, it is unlikely that there will be sufficient impetus to clean up sites.

Within this Plan, the NRA is concerned about sites which could affect the Estuary directly, such as the Capper-Pass site, and the Water's Edge development at Barton-upon-Humber.

Development involving the controlled storage and transportation of hazardous materials within the catchment may create a pollution and health and safety risk.

### BACKGROUND

Risk of pollution and health and safety problems are minimised by choice of location of development and careful attention to detailed design and construction. At present legislation is enforced by several different regulatory authorities including NRA, Health and Safety Executive and Local Planning Authorities. Co-ordination of regulatory requirements is necessary so as to ensure comprehensive pollution prevention measures are adopted in a consistent manner.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Prevent pollution of surface water and groundwater by hazardous materials.	Ensure that high risk sites are located in areas where pollutants can be easily excluded from surface water and groundwater.	NRA LPA's Developer/ Site owner and operator		■	■	■	■	■	■	(1)
	Ensure design and construction minimises risk and that appropriate pollution prevention and control equipment are in place and tested regularly.	NRA LPA's Site operator Developer	HSE	■	■	■	■	■	■	(1)
	Ensure adequate emergency procedures are in place and publicised and tested.	NRA Em Services LA's (Emergency Planning) Site Operator	HSE	■	■	■	■	■	■	(1)
Prevent risk to health and safety of employees, local residents and the general public.	Actions as above for pollution prevention.	NRA Em Services LPA's LA's (Emergency Planning) Site Operator/ Developer	HSE	■	■	■	■	■	■	(1)

<sup>(1)</sup> No costs are ascribed to preventative measures within good design and construction practice. NRA, LPAs, LAs and Emergency Services costs are internal and difficult to allocate to these actions. Developers and site owners costs are not known.

### EFFECTS

Pollution potential of surface water and groundwater as a result of spillages occurring will be minimised by the provision of containment facilities and emergency procedures.

There is a need to influence Local Planning Authorities to ensure that NRA interests are considered in the Town and Country planning process.

## BACKGROUND

NRA input to planning liaison is generally welcomed by Local Planning Authorities. The NRA has responded to opportunities to influence the Local Planning Authorities by setting up efficient and effective planning liaison arrangements.

The need to continue and build upon these arrangements is reflected in the Regional Planning Guidance, Planning Policy Guidance notes, and circulars, issued by DoE, and in the NRA's "Guidance Notes for Local Planning Authorities on the methods of protecting the water environment through Development Plans", Planning Liaison guidelines, and Development Control manuals.

A Memorandum of Understanding has been signed by the local authorities' representative associations and the NRA, in which the scope and timetable for provision of floodplain information has been agreed.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
To increase NRA influence in the Town & Country planning process.	Contribute to the formulation of National Planning Policy and Regional Guidance.	NRA	DoE LPA's	■	■	■	■	■	■	(1)
	Negotiate the inclusion of NRA interests in LPA Development Plan policies.	NRA LPA's		■	■	■	■	■	■	(1)
	Agree the inclusion of NRA requirements in decisions on planning applications.	NRA LPA's	IDB's	■	■	■	■	■	■	(1)
To encourage environmental enhancements as part of development and redevelopment.	Negotiate with developers directly and in conjunction with LPA's.	NRA LPA's	Developers	■	■	■	■	■	■	(2)

<sup>(1)</sup> Planning Liaison costs of NRA and Local Planning Authorities (and DoE in respect of Regional Planning Guidance liaison) are internal costs.

<sup>(2)</sup> Cost to developers of protecting or enhancing the water environment may be positive (cost), neutral, or negative (saving) and are difficult to quantify in the context of this issue.

## EFFECTS

Liaison often avoids problems and higher risks for purchasers, lower standards, and additional expenditure by owners, developers, and public bodies.

## ISSUE 29 - Issue added as a result of consultation

People, property and land are at risk from tidal flooding from the River Humber. Forecasting and dissemination of flood warnings to the public could be further developed.

### BACKGROUND

Following the serious East Coast flooding in 1953, the Met Office and MAFF introduced the East Coast Storm Tide Warning Service, whose aim is to provide a primary warning system. The NRA provides a more local or secondary warning system, which results in the issue to the police of tidal flood warnings for the East Coast and the River Humber. The system uses Met Office forecasts of wave speed and direction, wind speed and direction, and surge heights, together with astronomical tide predictions to determine if there is a risk of tidal flooding.

The system is based on historical records of flooding, and so must be continually updated as new information about flood risk sites, or the combinations of factors causing flooding, comes to light.

### EXAMPLES:

- Paull village
- Wharves on Tidal Trent.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Improve system for dissemination of flood warnings.	Undertake national project to identify a corporate approach to alternative ways of disseminating flood warnings.	NRA		■	■					TBE
	In the meantime, continue dialogue with police and County Council Emergency Planning Units.	NRA	Police LA's	■	■					No Cost
Improve the NRA's tidal forecasting system.	Update system to reflect any new information about flood risk sites and provide a consistent Estuary wide approach.	NRA MAFF	Police LA's	■	■	■	■	■		approx 40k
	Update system to reflect any new information about conditions likely to cause tidal flooding.	NRA MAFF		■	■	■	■	■	■	TBE
	Introduce new, and/or improve quality of existing warnings.	NRA	Police LA's	■	■	■	■	■	■	TBE

### EFFECTS

NRA's flood forecasting and flood warning will be improved.



The amount of sea-borne trade and the size of vessels are both set to increase, and their effects need to be taken into account in environmental protection and flood defence.

## BACKGROUND

Increase in volume of trade and the size of vessels will require modifications to berths and construction of new harbour facilities including storage areas. Additional dredging of navigation channels is unlikely. The modification of berths, and construction of new harbour facilities will involve land use development, and create pressures like those identified in Issue 25 in respect of land reclamation.

The physical effects of sediment generation and movement are covered in Issues 11 and 12, but account needs to be taken of the likely magnitude of changed practices, which are directly related to commercial activity.

OBJECTIVE	ACTION	RESPONSIBILITY		95/96	96/97	97/98	98/99	99/00	FUTURE	COST £K
		LEAD	OTHER							
Ensure that decisions involving use of more and larger vessels take full account of the environment and flood defences.	Study growth in shipping trade and the effects on the local economy, and predict impact on the water environment.	HCC LPA's	ABP NRA HCC Other LPA's Port operators	■	■	■	■	■	■	(1)
	Liaise with LPA's, ABP and operators.	NRA		■	■	■	■	■	■	(2)
	Ensure environmental assessment is made of all proposals for new facilities.	NRA	LPA's ABP	■	■	■	■	■	■	(1)

<sup>(1)</sup> Studies of shipping development, and environmental assessment are likely to cost several £10,000's per study. However, the environmental assessment work would be required anyway, and so costs should not be ascribed to this issue alone.

<sup>(2)</sup> Liaison costs are internal costs for each organisation involved and are difficult to quantify.

## EFFECTS

Increased volume of trade and vessel size will result in economic benefits to the area but environmental considerations need to be taken into account.

A greater risk of collisions, and the increased potential to make discharges from vessels and harbour areas, would increase pollution of the Estuary waters.

Increased confidence in calculation of the effects of sediment movement will aid conservation and flood defence management.

## 7. FUTURE REVIEW AND MONITORING

Working in partnership with identified organisations and individuals, the NRA aims to pursue the actions stated in this document to achieve the vision of the catchment.

Action groups will be established to monitor progress made by the NRA and all relevant responsible parties identified in the plan against the actions specified. Regular reviews of the action plans will be undertaken to identify progress and take into consideration any legislative or policy changes which may affect achievement.

The first annual review of the Catchment Management Plan is due in Spring 1996. Currently the Humber Estuary Management Strategy is being prepared in parallel with the action plan and it is intended at this stage, to have one document ensuring the Estuary is managed in a sustainable manner. The review will also take into account Catchment Management Plans being developed for rivers draining to the Humber.

The Humber Estuary Management Strategy is one of several projects on estuaries around England and forms part of English Nature's Estuary Initiative. English Nature acts as a facilitator in the production of the Management Strategy through strengthening communication links and promoting effective working partnerships between organisations. The aim of the project is to produce an integrated estuary management strategy for the Humber which will guide the future use of the Estuary through a partnership of key organisations that use and manage the Estuary.

Further details of issues and actions detailed in this Catchment Management Plan can be obtained from:

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## 8. INTEGRATION WITH OTHER INITIATIVES

Shoreline Management Plans are intended to provide a strategic framework for management of coastal defences for a specified length of coast and are being prepared for the coastline of England and Wales. A Shoreline Management Plan is being prepared to cover the area from Flamborough Head to Spurn Point and up the Estuary as far as Hawkins Point and from Grimsby to Donna Nook. The Plan will take approximately one year to prepare. It is being jointly promoted by Humberside County and Borough Councils together with NRA and MAFF; Holderness Borough Council is the lead authority.

The NRA has prepared a Humber Estuary Tidal Defence Strategy. This will provide a framework within which to consider sector strategies. It includes reference to the need for geomorphological studies of the Estuary, stage one scoping studies have now commenced. This Strategy will require regular review as understanding of the Estuary and other circumstances change.

Structure Plans for Humberside, Lincolnshire and North Yorkshire and the Urban Development Plan for Doncaster are the principal Development Plans for the Catchment Plan Area. All Plans were adopted some years ago and are being revised at present; the Consultation Draft of the Humberside Structure Plan (Revision) was published in March 1994, the Lincolnshire Structure Plan Alteration No.3 was placed on deposit in October 1993 and the Examination in Public of the North Yorkshire Structure Plan Alteration No.3 was held in April 1994. The part of the catchment in Doncaster Metropolitan Borough will be covered by the Doncaster Unitary Development Plan. The NRA has suggested inclusion of policies to protect and improve the water environment, in all of these strategic plans.

Development policies for specific sites and for subjects like minerals and waste, are contained in about 20 Local Plans being produced by District and County Councils and Doncaster MBC. The NRA has provided policy and supporting information for all of these Plans.

The Humber Estuary Standing Conference promoted jointly by NRA and Humberside County Council, and Local Agenda 21 Action Programmes developed by Humberside County Council are useful initiatives which emphasise the importance of the Humber Estuary. Whilst the objectives of these initiatives differ from those of the Humber Catchment Management Plan, where common ground exists the NRA will maximise the opportunity to work with others to improve the aquatic environment.

To facilitate both stronger links and wider support with other interested parties, the NRA intend to integrate this Plan with the Humber Estuary Management Strategy (HEMS) currently being prepared by English Nature, Local Authorities and other groups.

Other Catchment Management Plans may impact on to the Humber Estuary and these include:-

<b>DON, ROTHER &amp; DEARNE</b>	<b>Final Plan due June 1995</b>
<b>HULL &amp; COAST</b>	<b>Final Plan due July 1995</b>
<b>LOUTH</b>	<b>Final Plan published August 1993</b>
<b>GRIMSBY</b>	<b>Final Plan due May 1995</b>
<b>SWALE, URE &amp; OUSE</b>	<b>Final Plan published January 1995</b>
<b>ANCHOLME</b>	<b>Final Plan due June 1996</b>
<b>LOWER TRENT</b>	<b>Final Plan due February 1998</b>
<b>AIRE</b>	<b>Final Plan published 1993</b>
<b>DERWENT</b>	<b>Final Plan published November 1994</b>
<b>SWALE, URE &amp; OUSE</b>	<b>Final Plan published January 1995</b>
<b>NIDD &amp; WHARFE</b>	<b>Final Plan published</b>





# The National Rivers Authority

## *Guardians of the Water Environment*

The National Rivers Authority is responsible for a wide range of regulatory and statutory duties connected with the water environment.

Created in 1989 under the Water Act it comprises a national policy body coordinating the activities of 8 regional groups.

The main functions of the NRA are:

*Water resources*

- The planning of resources to meet the water needs of the country; licensing companies, organisations and individuals to abstract water; and monitoring the licences.

*Environmental quality and Pollution Control*

- maintaining and improving water quality in rivers, estuaries and coastal seas; granting consents for discharges to the water environment; monitoring water quality; pollution control.

*Flood defence*

- the general supervision of flood defences; the carrying out of works on main rivers; sea defences.

*Fisheries*

- the maintenance, improvement and development of fisheries in inland waters including licensing, re-stocking and enforcement functions.

*Conservation*

- furthering the conservation of the water environment and protecting its amenity.

*Navigation and Recreation*

- navigation responsibilities in three regions — Anglian, Southern and Thames and the provision and maintenance of recreational facilities on rivers and waters under its control.



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Published by the Public Relations Department of the National Rivers Authority, Anglian Region, Kingfisher House, Orton Goldhay, Peterborough PE2 5ZR. Telephone (01733) 371811.

Printed on totally chlorine free paper.

P109/5/95  
AN-5/95-2.5K-A-NUU