



ENVIRONMENT AGENCY

HUMBER ESTUARY

action plan

O U R C O M M I T M E N T





As the largest environmental body in Europe, the Environment Agency has a major role to play in the future well-being of the Humber Estuary. We manage a wide range of functions, from Process Industry Regulation to Navigation, Fisheries to Flood Defence, and our approach towards environmental improvement aims to be both comprehensive and cost effective.

foreword



Three of the Agency's Regions have responsibility for managing aspects of the Humber Estuary. Over the past two years many colleagues have worked closely together to ensure we manage the Estuary as a single entity and that all our actions contribute to a better Estuary for the future. This process has been enhanced by the parallel development of the Humber Estuary Management Strategy (HEMS) of which the Agency is a full and active partner. This has shown that a wide range of bodies can work together to achieve consensus on both their objectives and the approach needed to achieve them.

This Humber Action Plan represents the Environment Agency's commitment in three fields:-

- Promoting its own environmental strategy for ensuring a better future for the Humber Estuary environment
- Working in full and open partnership with the other key partners in the Humber Estuary Management Strategy
- Identifying actions and results openly and willingly, enabling our customers to measure our progress against stated intentions

I hope you will find the Action Plan useful and informative; if you have any queries or comments on our proposed actions and the explanations for them, please contact Peter Barham, the Humber Strategies Manager.*

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Chairman of the Humber Management Group

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Vision
statement
for the
five year
Humber
Estuary
Action
Plan

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Environment Agency

To work towards the sustainable management of the Humber Estuary as a whole, balancing the legitimate interests of all aspects of the estuary.

Key Objectives are:

to maintain and enhance its current national and international nature conservation value

to reduce the flooding risk to people and the developed and natural environment

to reduce the discharge of dangerous substances to the North Sea and improve water quality of the Tidal Ouse

to improve or restore the run of migratory salmonids into the Humber's tributaries

to manage flows for the Trent and Ouse, balancing the needs of all water users

to ensure that the recreational potential is improved

to work with all relevant parties towards sustainable development

to balance the needs of commercial navigation and industrial, urban and agricultural development with the requirements of the environment

to improve our knowledge of the relationships between sedimentary processes, rising sea levels and the natural boundaries of the Estuary

to achieve major and continuous improvements in air quality

to reduce the amount of waste by encouraging reduction at source, recovery and re-cycling of waste

to improve waste disposal standards

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The Environment Agency has a huge workload in the Humber Estuary. This work reflects the enormous economic and environmental importance of the Estuary and the wide range of duties of the Agency in maintaining and improving the overall quality of the Estuary.

Alongside nationally important industries and ports the Estuary is also globally important for the birds it supports during their migration. In addition, flood defences protect 500,000 people and very large tracts of productive farmland from flooding from the sea. The pressures on the Estuary from all these things mean that there is a real need for management to ensure that the needs of one do not harm the needs of others. For example, continued improvements to water quality are essential to improve the well-being of the animal life in the mudflats which is the foodstuff of migrating birds. Equally, improvements to flood defences must not cause damage to the habitats or species which make the Estuary so important and attractive for wildlife.

So that the Agency meets all its aims, it has adopted a number of approaches which help to ensure that by meeting its own targets, it is also contributing to the continued and future well-being of the Humber Estuary. These include:

managing the Estuary as a single entity and not on a piecemeal basis

identifying clear targets for work and operating in an open and business like way

working in consistent ways across all the functions of the Agency

The effect of this is that the Environment Agency is committed to being a full and active partner of Humber Estuary Management Strategy (HEMS), working for the benefit of the whole Estuary to targets which are not just those of the Agency but of all those involved.

This Action Plan sets out the actions which the Agency is taking, or will take, to address the issues that have been identified by the HEMS partnership. Each action has been determined in response to the issues and the Agency's responsibilities, hence they cover the whole range of Environment Agency functions. At the same time every action also relates to the environmental themes of the Agency as set out in its environmental strategy for the millennium and beyond.

A large number of people in the Agency are involved in delivering these actions and to meet the last of the objectives above they are working together more and more to make sure that what they do is right, consistently done and cost effective.

This Action Plan represents a commitment by the Environment Agency not only to its own environmental strategy, but also to working in full partnership with others to ensure a better future for the Humber Estuary from both environmental and economic viewpoints.

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The Environment Agency was formed on 1st April 1996, merging the expertise of the National Rivers Authority, Her Majesty's Inspectorate of Pollution, the Waste Regulation Authorities and some technical units of the Department of the Environment.

Our aims are:

to make a difference that lasts contributing to the long term well-being of the environment

comprehensive environmental protection protecting air, land and water

education helping others understand threats to the environment and their role in ensuring a better environment

enforcement promoting pollution prevention over prosecution, but using legislation and enforcement to protect the environment where necessary

Our principal aim is to protect and enhance the environment as a whole. By doing so, we can play our part in ensuring a better environment for the future, taking a much wider view of environmental regulation and management than was possible for our predecessors.

Our publication 'An Environmental Strategy for the Millennium and Beyond' sets out those areas of work which the Agency considers to be most important, while appreciating that these priorities are best undertaken in partnership with others. This Action Plan sets out how the Agency and its partners will deliver its contribution to the Humber Estuary Management Strategy (HEMS).

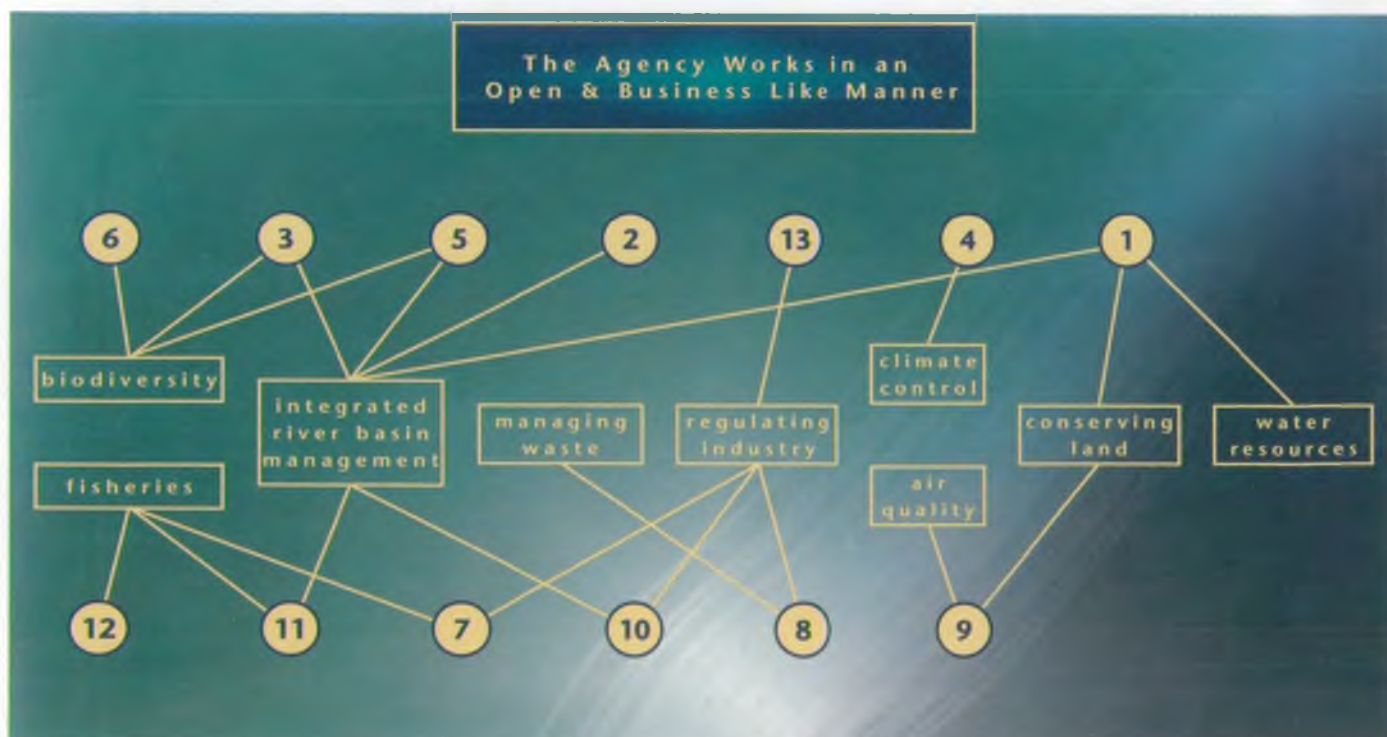


Figure 1. The Relationship Between the Themes of the Environment Agency's Environment Strategy and the Key Issues of HEMS.

Key Issue 1

We need a strategic Planning framework to guide co-ordination and co-operation between all organisations with responsibilities for planning and management of land and water use activities in the HEMS area.

Key Issue 2

We need to improve our understanding of the physical and sedimentary processes at work in the Humber Estuary, so it can be managed in a sustainable way.

Key Issue 3

We need to understand the physical processes linking the Estuary and adjacent open coastlines, so they can be considered carefully in strategy development and land use planning.

Key Issue 4

We need to respond to predicted rates of sea level rise and coastal squeeze.

Key Issue 5

We need to protect people, property and key areas of land/infrastructure from flooding and maintain conservation. We also need to decide how to balance these requirements to provide long term effective and sustainable tidal defences.

Key Issue 6

We need to integrate the conservation and enhancement of the internationally important sites (Special Protection Areas, SPA) on the Estuary with the development needs of ports and industry.

Key Issue 7

We need to improve water quality in the Humber Estuary to comply with National and European standards, and encourage effluent discharges to adopt the Integrated Pollution Control (IPC) concept.

Key Issue 8

We need to promote the benefits of waste minimisation more widely.

Key Issue 9

We need to promote the benefits of reclaiming areas of contaminated land more widely, to reduce pressure on green field sites, and to promote redevelopment for economic use and environmental gain.

Key Issue 10

We need to ensure the sustainable economic development of the Estuary's ports, wharves and industrial base.

Key Issue 11

A framework is needed to guide recreational management of the Estuary and its environs, ensuring integration with other estuary interests.

Key Issue 12

We need to ensure the sustainability of current and future tourism on the Humber.

Key Issue 13

We need to improve education and establish information exchange initiatives based on the HEMS region, and to encourage research and development work on the many issues associated with estuary management.

The Environment Agency's Contribution To HEMS

The Humber Estuary Management Strategy has been developed as a partnership initiative to ensure that future actions and developments in and around the Estuary are economically and environmentally sustainable. Organisations involved in developing the strategy with the Agency include Local Authorities, Associated British Ports (ABP), English Nature, industrial and agricultural representatives, landowners, conservation and recreation bodies.

The strategy was first published in July 1996 as a draft consultation document outlining key issues which impact upon the Humber area, and the related objectives and actions which would benefit the Estuary. These issues and objectives are fully explained in the HEMS consultation document, and are summarised on the previous page. Figure 1 shows the strong links between the Agency's environmental themes and how, by working on these, the Agency is playing its part in addressing the key issues in HEMS.

As a member of HEMS, we have ensured that our objectives, aims, duties, responsibilities and functional needs are incorporated within the strategy. This means the aims and objectives of HEMS reflect those of the Agency, as well as our partners, so we are all working together towards these common goals.

The Environment Agency has a large workload in the HEMS area ranging from regulating process industries, waste management and water quality, to building and maintaining flood defences and associated conservation activities. We have recently reviewed our activities around the Humber Estuary, and the progress made on issues set out in the former National Rivers Authority Catchment Management Plan issued in 1995 recorded in a Review published in December 1997. To demonstrate our commitment to HEMS we have decided that rather than continue with our own independent management plan for the Estuary, it would be better to prepare an Action Plan showing how we will deliver the HEMS objectives. This document is the the outcome of that decision.

we are all working
together towards these
common goals

THIS DOCUMENT SETS OUT THE ACTIONS OF THE AGENCY AGAINST THE
ISSUES IDENTIFIED IN HEMS, WHICH REFLECT OUR RESPONSIBILITIES, DUTIES
AND OBJECTIVES, AND WHICH WORK TOWARDS THE OVERRIDING
OBJECTIVE OF A SUSTAINABLE FUTURE
FOR THE ESTUARY.

TO SUCCEED, WE MUST WORK IN AN OPEN PARTNERSHIP WITH
OTHERS SHARING KEY ROLES OR INTERESTS. THE ACTIONS
OUTLINED IN THE ACTION PLAN THEREFORE ADDRESS THE ISSUES
IDENTIFIED IN THE HUMBER ESTUARY MANAGEMENT STRATEGY (HEMS),
IN WAYS CONSISTENT WITH THE AGENCY'S OWN APPROACHES.



In addition
to our
commitment
to HEMS,
our approach
to managing
the Humber
Estuary
aims to
resolve a
number of
wider issues

These are:

Flood Defence

Approximately 1500km² of land around the Estuary are protected from flooding from the sea by 230km of tidal and fluvial defences. This area, of significant and growing economic value, has a wide range of industry and ports providing an important link to Europe. Much of the land used in agriculture is classified as high grade and there are also important conservation habitats, as well as homes for approximately 500,000 people. Therefore we must ensure that flood defences are maintained and improved where appropriate.

Environment

The environmental quality of the Estuary, much of which is now designated as a Special Protection Area under the European Habitats Directive, to protect birds and their habitats, is dependent on many factors that we can directly influence. These include water quality, inter-tidal habitat management, flood defence work and Integrated Pollution Control. The protection and continued improvement of environmental quality is a priority in all the Agency's work.

Expectations and Aspirations

There are many organisations and individuals with particular aspirations for the Estuary. These will not always be the same or even complimentary. We must be aware of these and their impact on the management of the Estuary as a whole. Our actions must not exacerbate any potential conflict, but resolve it wherever possible.

Consistency of Approach

Three Agency Regions (Anglian, North East and Midlands) are responsible for the Estuary and must work together to manage it as a single entity. We are developing consistent approaches to management which:

- ▶ improve co-ordination of inter-Regional activities
- ▶ reduce instances of duplicated and therefore wasted effort
- ▶ provide a more consistent service to our customers
- ▶ are more cost effective.

A dedicated internal management group will tackle these issues, determining the direction and actions of all Agency people with duties relating to the Humber Estuary. We are also committed to working fully and openly with all partner organisations involved; to identify not just what we do, but also how we do it.

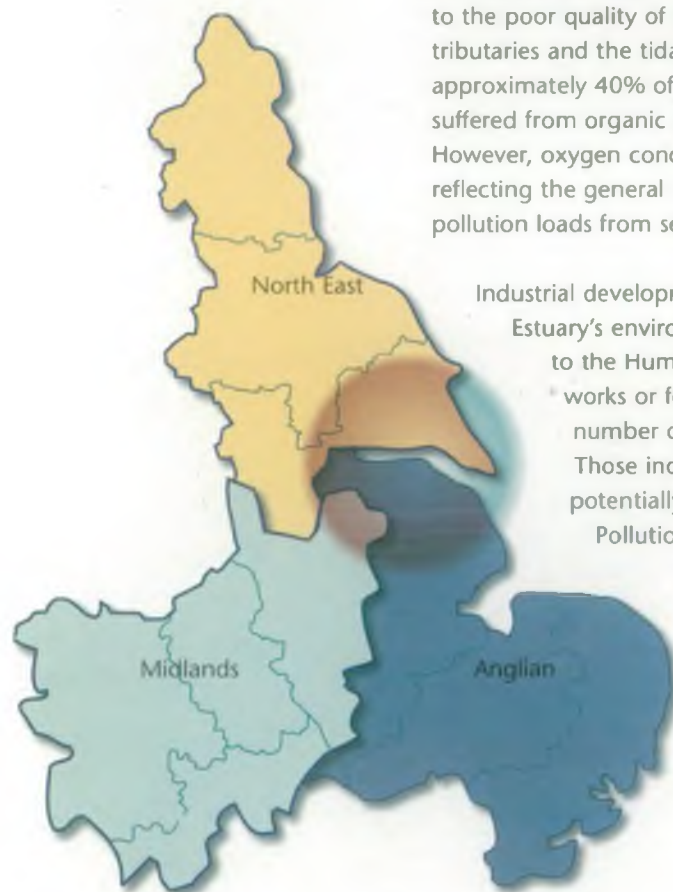
The Humber Estuary is one of the most important British estuaries for many reasons, including the economy it supports, its wildlife and its geographical features and landscape. It is a large estuary, draining one fifth of England with water coming from the rivers of the Agency's North East, Midlands and Anglian Regions. Humberside is a key location for British trade, with ports occupying a pivotal place for European trade: Grimsby and Immingham is now the largest port complex in the UK. The importance of this link is also evident historically, as demonstrated by the extensive archaeological record from the Bronze Age onwards. Away from the major urban areas such as Hull and the industrial zones, the Estuary is surrounded by highly productive farmland, much of which has been reclaimed from saltmarsh.

Environmental Quality

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, but the input from the Ouse system must improve.

Biologically the Estuary is healthy, with at least 180 species of invertebrates recorded. The high sediment 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 per m². This abundance is reflected in the number of birds and fish in the Estuary feeding on them.

One of the main factors determining the current poor quality of the Tidal Ouse is low dissolved oxygen levels. This problem has existed for many decades, largely due to the poor quality of effluent discharged from sewage treatment works on its tributaries and the tidal River Ouse itself. Similarly the River Trent, which provides approximately 40% of the freshwater flow to the Humber Estuary, has historically suffered from organic pollution, leading to depleted oxygen levels in the Estuary. However, oxygen concentrations have increased steadily over the past 30 years, reflecting the general improvement of effluent quality and reduction in substantial pollution loads from sewage sources.



Industrial development both within and outside the Plan area impacts on the Estuary's environment. Some firms treat their trade effluent before discharge to the Humber; others go to sewer for either treatment at a sewage works or for discharge with untreated domestic sewage. However the number of untreated effluents is very small and decreasing rapidly. Those industrial processes deemed by the government to be potentially the most polluting are regulated through Integrated Pollution Control (IPC) authorisations. These set the conditions and release limits for processes compliance, covering emissions to the land, air and water. In line with the Government's commitment to reduce the discharge of Dangerous Substances to the North Sea (by 50% of the 1985 emission levels), we have been working with industry and the water companies with considerable success, for example at Tioxide and Millenium and Organic Chemicals.

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Industries have spent £300m on improving the quality of final effluents discharged to the Estuary over the last five years. Environment Agency personnel help plan this investment and can determine the most cost effective actions required to achieve desired water quality objectives. However the Agency will not hesitate to prosecute where authorisations and consent conditions are breached.

We are also preparing to implement the Integrated Pollution Prevention and Control (IPPC) Directive in 1999, which will extend the existing Integrated Pollution Control concept to a wider range of industries and processes. This will affect many industries in the Humber catchment, some coming under regulation for the first time. As compliance requirements become more clear, we will work closely with those affected and Local Authorities to ensure the Directive is implemented fairly and consistently.



The Humber is the largest freshwater input to the North Sea from the English Coast, so it's a substantial nutrient contributor. Large amounts of nutrients in coastal waters can cause excessive plankton growth, which as they die can wash ashore as unpleasant scums, foams or mats of rotting vegetation. There are occasional red tides and similar plankton induced episodes. We monitor the nutrient input from the Humber to the North Sea closely, but do not believe it is a problem.

The natural flow pattern of freshwater flows into the Estuary has been modified by human influence. Both the southern industrial tributaries of the Yorkshire Ouse and the River Trent contain significant artificial components. These are caused by effluent discharges within these catchments of water imported from other catchments, notably in the case of the Trent where water is introduced from the Severn basin.

The salty nature of the water in much of the plan area limits its uses for direct abstraction.

Flood Defence

An area of some 1500km² within the plan lies below high spring tide level and is 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; it also includes much high grade agricultural land (see figure 8).



The existing defences (see figure 2) in the Estuary vary widely in both their type and size. The smallest defences are relatively low earth banks, while the most complex is the Hull Tidal Surge Barrier which is lowered at times of high risk. Much of the existing defences are fronted by mudflats and saltmarsh. These are an integral part of flood defence and some are designated as Sites of Special Scientific Interest (SSSIs), and Special Protection Areas (SPAs) sites. This recognition of their environmental importance, in both UK and European legislation, underlines the need for all proposed flood defence works to undergo a full environmental assessment throughout the appraisal process, subsequent development of actions and implementation.

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The 1953 East Coast flooding resulted in significant upgrading of the Humber defences, many of which are now reaching the end of their design life and will increasingly require repair or eventual replacement. In addition to the deterioration of the existing defence, rising sea level relative to the land and loss of foreshore are steadily and continuously eroding the standard of protection given. The combined effect of rise in sea level and loss of foreshore is termed 'coastal squeeze' and is a major concern for two reasons. Firstly, inter-tidal areas such as saltmarsh and mudflat, both of paramount importance to conservation, are being lost. Secondly, these inter-tidal habitats are also very important for flood defence as they help to dissipate wave energy. This means that flood defences fronted by mudflats and saltmarsh in particular are more effective, require less investment and are more sustainable.

There is a great deal of archaeological interest in and around the Estuary. This is potentially under threat from a range of activities including flood defence works and we must identify undiscovered sites prior to development work being carried out.

The Environment Agency is pursuing a long term strategy for improving the Humber tidal defences, using our understanding of the physical process operating within the Estuary. This will take into account the Estuary's many uses, particularly its importance to nature conservation and wildlife, and is discussed more fully as part of Key Issues 2, 3, 4 and 5.

Figure 2. Map of Existing Flood Defences.



Fisheries

Marine species of fish dominate the fish stocks, particularly in the outer Estuary, with estuarine and freshwater fish also present. The outer Estuary is of particular importance as a nursery area for North Sea plaice. Plaice, dab and sand goby are the three most abundant species, with sole and cod as target fish for sea anglers.

Migratory fish such as eels, salmon and flounder also frequent the Estuary. Eels are fished for, mainly on a part-time commercial basis. A prolific salmon fishery existed up until the end of the nineteenth century, but no commercial fishery exists now. Proposals to restore the salmon run are being evaluated both in the Estuary and in the source rivers. The shrimp fishery is exploited at a low level commercially, while the shell fish fishery is now much reduced following a decline in stocks.

Conservation

The Humber Estuary is renowned for the bird populations which it supports throughout the year, particularly during migratory passage and as winter residence. The extensive inter-tidal mudflats, fringing marsh, reed bed and open water habitats provide all year round sources of food, safe roosts and breeding sites for waders, waterfowl and passerine species. Protecting these habitats is essential to the maintenance of the Humber Estuary's conservation status and the internationally important bird populations. Opportunities exist to enhance these habitats as part of our flood defence and conservation work, in collaboration with other partners.

The Humber Estuary's importance to nature conservation has been recognised by a number of international and national designations, for example, the entire Estuary qualifies as a Special Protection Area (SPA) under the European Habitats Directive and parts have been proposed as designated sites under the Ramsar Convention of Wetlands of International Importance. National designations include seven Sites of Special Scientific Interest (see figure 5), nine Wildlife Trust reserves, a designated Heritage Coast at Spurn Head, RSPB reserves, and part of the Upper Humber is a wildfowl refuge.

Recreation and Tourism

A number of locations around the Estuary attract significant numbers of visitors (see figure 9), drawn by the wildlife and the spectacular scenery. The Humber Bridge is an important visitor attraction in its own right. The use of the Humber for sport and recreation remains comparatively undeveloped because its waters are difficult for navigation by small craft, due to shifting sand banks, high levels of commercial shipping and strong tidal currents.

Recreational sea angling is increasingly successful, mainly in areas of easy access, and coarse fishing is popular on the drains and streams entering the Estuary and on the many lakes and pits bordering its banks.

Sailing and cruising take place in the Estuary, with cruising also in the navigable lower sections of rivers entering it; there are a number of marinas and moorings within the Estuary, and Cleethorpes has EC designated bathing water.





Ports

The Humber is one of the UK's foremost commercial waterways, with approximately 18% of all cargo entering and leaving the UK passing through its ports and wharves. Associated British Ports (ABP) is the navigation authority and port owner; it operates an extensive programme of depth monitoring and dredging to enable safe passage of vessels.

Waste Regulation and Management

In its draft Strategic Framework, the Regional Assembly for Yorkshire and Humberside recognises, amongst other issues, the need to raise awareness in business and households and reduce waste, pollution and environmental costs, while making savings through better use of resources. We are working towards this in a number of ways:

We participate in the strong waste minimisation programme already existing in the Humber. Companies not currently involved could benefit from the experience of those who have already reduced their operating costs and improved environmental performance.

During 1998 we will begin a National Survey of Waste arisings. This will involve meeting with companies in the Humber area to estimate waste generation. For the first time in this country accurate, comparable waste generation statistics will be available. The Agency will use the waste survey results to develop a National Waste Strategy. Close liaison with local authorities and others will ensure that local waste plans and the National Strategy are compatible.

To achieve this the Agency has set out to:

- 1 promote and implement waste (gaseous, liquid and solid) reduction and minimisation processes
- 2 encourage waste recovery techniques such as recycling, composting and energy production
- 3 improve awareness of waste recycling/minimisation opportunities by publicity and education.

The Agency licences and supervises licensed waste management activities to prevent pollution of the environment, harm to human health and detriment to local amenities. This legislation controls the treating, keeping or disposal of waste, and applies to waste produced by households, commerce and industry. It also includes waste going to transfer stations, recycling centres, and treatment plants. The Agency can also influence the quantity and quality of waste generated by the granting of authorisation to those industries subject to Integrated Pollution Control (IPC) legislation.

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Efficient waste management is an important element of the Government's strategy for sustainable development. The Agency's waste objectives are to reduce the quantity society produces, make the best use of it and minimise its risks to the environment and human health now and in the future. Industrial activity in this plan area generates particularly large quantities and varieties of waste, emanating from both the larger industrial concerns and from smaller business units and houses. As the financial cost of disposing of waste increases, and we become more aware of its environmental impact, it becomes more challenging to find suitable landfill sites in locations which match waste generation trends and do not threaten the environment.

To reduce the financial and environmental burdens associated with waste, both industry and society must analyse the consequences of producing the goods we demand and then dispose of. This means analysing the life cycle of products and production methods, with special emphasis on minimising waste, both in terms of quantity and its potential to pollute. Additionally, consumption of natural resources must be closely evaluated to ensure that non renewable assets are being managed wisely.

Process Industry Regulation

The Environmental Protection Act 1990 and subsequently the 1995 Environment Act introduced new accountabilities covering pollution prevention and control, and in particular the aim of having regard to sustainable development. This objective introduces increased flexibility in considering the impact of releases from prescribed Process Industries on the environment as a whole. Such considerations will be addressed when looking at short and long range effects of the many major industrial sites bordering the Estuary.

Integrated Pollution Control (IPC) is a truly integrated approach towards regulating releases to air, land and water. It seeks to prevent or minimise the environmental impact of certain industrial operations, by directing any releases to the medium where they will cause least harm. IPC authorisations are issued by the Agency for certain industrial processes deemed to be the potentially most polluting.

The Humber Estuary has a range of industries with established pollution problems such as volatile organic compounds, heavy metals and sulphur dioxide emissions. However, there are a number of new issues that have an increasing profile that will need to be addressed eg, dioxins, waste incineration and contaminated land. New legislation such as the IPPC Directive and the other international obligations arising from the Oslo Paris Commission, the Montreal Protocol on protection of the ozone layer and the convention on the environmental protection of the North Sea, also need to be considered. The Agency will incorporate such issues in future reviews of the HEMS where appropriate.

Although the Agency is not directly responsible for Air Quality other than where it controls emissions as part of Integrated Pollution Control, it does have a consultative role in the National Air Quality Strategy, which is the responsibility of the Local Authorities. The Agency's involvement in the HEMS forum should help further such consultative partnerships.



**Consultation
forms a
major part of
the Agency's
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component in
developing
H E M S**

Consultation is important for determining not only what the Agency does, but how it does it. For example, the Agency set up a steering group of key organisations to advise us on preparing the terms of reference for an Estuary Shoreline Management Plan (ESMP - see Key Issue 3). The same steering group also monitors and advises on the progress of the work. At the same time, the production of an ESMP was considered to be an important part of achieving the objectives identified in HEMS with regard to the long term planning of flood defences in the Estuary.

Through this process, many of the actions presented in the Action Plan have already undergone consultation; further consultation would lead to repetition and consultation fatigue. Equally to consult over the objectives of the work would be a repetition of the consultation over HEMS. For these reasons, this Action Plan has not undergone a separate round of consultation as would be the case in the production of a LEAP, but has been through the committee structure of the Agency, including the Area Environment Groups and Flood Defence Committees.



The Agency's principle vehicle for planning its activities at the local level is the Local Environment Agency Plan (LEAP). LEAPs are being developed for the areas neighbouring the Humber and for the river catchments draining into it. The policies and actions in these plans will take account of the needs of the Humber. The programme of LEAPs is:-

LEAP Title	Date of Plan Adoption
Derwent	April 1998
Ouse, Ure & Swale	June 1998
Wharfe & Nidd	August 1998
Aire	April 1999
Calder	April 1999
South Yorkshire & N E Derbyshire	August 1998
East Riding & Kingston-upon-Hull	August 1998
Grimsby & Ancholme	June 1999
Lower Trent & Erewash	November 1999
Idle/Torne	July 2000



The HEMS partnership identified 13 key issues, each with a number of objectives. Many of the actions needed require collaboration between partners. The HEMS partnership is already examining ways of achieving synergy. It is essential however, that each of the partners set out their proposed actions as a baseline for further discussion and working together.

This section of the plan sets out the background and some of the key information behind each of the main issues, with particular reference to the Agency's involvement and responsibility. For each of the issues, we have set out the objectives identified in HEMS but shared by the Agency. It is against these objectives that the Agency's actions have been identified. For each issue, we have also set out the key action points. It is important to emphasise that the actions described give a general indication of the work to be done by the Agency. A complete description of all the aspects of the Agency's work would be extensive and not contribute to identifying the big picture of what the Agency aims to achieve. Consequently, details of routine monitoring, inspections, enforcement and maintenance are not given.

The following pages set out:

- ▶ The Issue
- ▶ Background to the Issue
- ▶ The Objectives
- ▶ Actions the Agency is committed to in order to achieve these objectives
- ▶ A timescale of the Agency Actions where appropriate

It has to be recognised that for some of the issues identified, the solution will be achieved within the timescale of this Plan while for others it will take considerably longer. Proposed Actions may be constrained by the changing priorities of the Government and the Agency, and by the availability of resources; for example, all flood defence schemes promoted by ourselves are subject to strict cost benefit analysis and environmental assessment before they are approved. In seeking commitment from the other organisations, we try to balance the interests of the different users of the Plan area. Given these constraints, we expect that the timescales given in the Plan will be met.

Review Process

Some of the issues will be more readily resolved than others. The actions identified in this Plan will be reviewed annually to assess what changes are required. Equally, the review will also be carried out as part of a full review of HEMS and the issues associated with delivering a long term strategy. The Agency will undertake these reviews to time with the annual review of HEMS by all the partners.

A Strategic Planning Framework is needed to guide the co-ordination and cooperation between all organisations with responsibilities for planning and management of land and water use activities in the HEMS area.

KEY ISSUE 1

Background

Land use planning and development control are an intrinsic part of sustainable economic, social and environmental development. Structure and development plans reflect the needs and aspirations of local communities in line with National and Regional Planning Guidance. There is a need to view land use planning across the whole of the Region to avoid piecemeal development and inconsistency or incompatibility between statutory and non-statutory plans and to avoid administrative fragmentation. HEMS provides an overview of estuary-wide land use planning needs and opportunities to inform the development planning process.

To take maximum advantage of the potential to develop the economic and improve social and environmental conditions in a sustainable manner, it is necessary to consider the Humber area in an estuary-wide context. To achieve this, it will be necessary for regulatory authorities to work together to develop a framework for strategic planning.



Consultation is a very important part of our work and sharing of knowledge will lend strength to partnerships and to the validity of actions undertaken to resolve conflict.

Following the re-organisation of local government, there is a need for a mechanism to co-ordinate policy development in the HEMS area. The Humber Estuary Management Strategy will provide non-statutory supplementary guidance to assist individual Local Authorities to harmonise their policies and to co-ordinate the management activities in the Humber area, by bringing together the key partners and identifying the common ground.

We are reviewing all permissions which could be influenced by the Habitats Directive.

A Group has been formed including English Nature, Local Authorities, RSPB, The Wildlife Trusts and the Agency to start the process of developing a Biodiversity Action Plan for the Humber Estuary. The Plan will help identify the conservation objectives which we and others will need to target as part of our actions.



Objectives:

encourage sustainable use of land allocated for economic development around the HEMS area and ensuring that development is consistent with the national guidelines for the planning and management of the HEMS area.

ensure that capital investment within the flood plain is consistent with the government advice given in PPG20 which states that the Development Plan Policies should not normally designate land in such areas for development except that which requires a coastal location.

ensure that the open landscape and amenities of the Estuary are not adversely affected by the siting, design and landscaping of new developments such as industrial complexes, transport corridors and transmission lines.

encourage discussion and communication between different user groups in order to share knowledge and experience and so improve understanding by helping to avoid, resolve and mitigate conflict and realise mutual benefit.

encourage continued development and operation of an estuary wide emergency planning framework.

develop a local Biodiversity Action Plan (BAP) for the Humber Estuary as a contribution to the achievement of the National Biodiversity Action Plan targets for key estuarine habitats and species.

be consistent with long term flood defence needs and objectives.

be compatible with the concepts of Integrated Pollution Control (IPC).

The Agency will:

continue to develop our long term Flood Defence strategy in liaison with partner organisations. An Estuary Shoreline Management Plan will be produced by December 1999, which will be the basis for the long term strategy (see Key Issue 3).

identify from the Estuary Shoreline Management Plan, the Estuary-wide issues associated with the Agency's actions and work with the Local Authorities and others to ensure that the implications are properly addressed. 1999/2000

provide Local Planning Authorities with specific guidance on issues of direct interest to the Agency's functions. Ongoing

organise a conference/workshop for all Planners involved with the Humber. Late October 1998

liaise with individual Planning Authorities and with Government offices, the new RDA, Regional Chamber, and Regional Assembly for Yorkshire and Humberside. Ongoing

continue to provide input to Local Authority Plans and strategies and give advice to developers. Ongoing

work with others to develop and implement Emergency Planning and Response for the Humber Area. A series of informal meetings will be held with the Unitary Planners. 1998 Onwards

We need to improve our understanding of the physical and sedimentary processes at work in the Humber Estuary in order to ensure that it is managed in a sustainable way.

KEY ISSUE 2

Background

The physical shape and form of the Humber Estuary is changing over time. These changes result from both natural processes and the activities of mankind which have also altered man's use of the Estuary. For example, Spurn Head in the 11th Century was home to a thriving fishing port which was subsequently washed away in the 14th Century.

The processes impacting upon the Humber and causing this change are diverse, complex and interactive, including:

the wind
waves
tides
rivers
rising sea level (see Key Issue 4)
human influence eg, reclamation, flood defence work and pollution



These processes in turn influence both erosion and sediment behaviour within the Estuary itself. The source of the sediment being moved into the Humber is subject to investigation - much is believed to originate from the East Yorkshire coast and some from the North Sea itself. The volume of fluviially derived sediment is only significant in the upper reaches of the Estuary.

The net effect of sediment movement is not known for certain; there is some evidence in recent years that there is an overall loss from the Estuary, which it is anticipated could adversely impact on foreshore levels, tidal flood defences and the conservation value of mudflats.

Although there is an emerging understanding of these processes, there is still room for improvement. Further research into sediment sources and sinks and the hydraulic processes of the Estuary is needed.

Inter-tidal habitats such as saltmarsh and mudflats are sustained by physical processes and their loss through erosion has serious implications for wildlife because they support a productive food chain of invertebrates, fish and birds. Deposition of silts may also damage fish nursery and feeding areas, and erosion or accretion of sediments may expose or cover archaeological finds. At the same time, the value of saltmarshes particularly for flood defence is increasingly recognised (see Key Issue 5).

The Humber is a highly engineered channel. Past and continuing activities, including reclamation, warping and the construction of jetties, training walls and tidal defences, constrain the natural development of the Estuary's form by directly or indirectly disrupting the sedimentation processes. Careful consideration must therefore be given to all development proposals which have the potential to influence the movement and distribution of sediment.

The deep water channel needs continuous dredging to provide safe and continued access for deep draughted shipping to the Immingham jetties and other ports. Another effect of the dynamic sedimentary processes is that sediment infill of channels may hinder mooring of craft and restrict access to watercourses by pleasure craft. The quantities dredged from the channel, port entrances and docks fluctuate significantly due to tidal conditions. The material is deposited under licence by the Ministry of Agriculture Fisheries and Food (MAFF) at sites which allow the silts to recirculate in the estuarine system. We need to examine whether there is any potential to use the dredged material to enhance intertidal habitats for flood defence and/or conservation purposes.

The Agency's role to maintain, operate and improve flood defences along the Estuary (and elsewhere) highlights the need to improve our knowledge of these sedimentary processes and erosional forces. Information on these processes will help us develop long term sustainable strategies, which also take advantage of the conservation opportunities the investment in tidal defences can create, and at the same time avoid wasted expenditure on inappropriate defences.

Objectives:

provide sustainable and effective flood defences.

implement flood and coastal defence policy of MAFF and the Environment Agency.

work with nature to reduce coastal flooding.

develop new methods to survey and manage flood defences.

invest in research to predict the likely effect of climate on the environment and how to manage it.

Throughout the work, we will continue to monitor the Estuary and collect data.

The planning and development of this work is the result of extensive consultation with all key interests around the Estuary. The work agreed will take place over the next two years. Further detailed studies will follow. Throughout the programme, sediment movements in particular will be very carefully monitored, but in the later stages of the work other new data requirements are likely to emerge. Finally, we will review the ESMP to incorporate all of the findings of the detailed studies outlined above. The whole process will take between four and five years.



Intertidal habitats are sustained by physical processes: their loss through erosion has serious implications for wildlife because they support a productive food chain of invertebrates, fish and birds. Deposition of silts may cover fish nursery and feeding areas, and erosion or accretion of sediments may expose or cover archaeological finds.

The Programme

EARLY OUTPUTS AND TIMESCALES FOR DELIVERY

Table 1

Project	Programme / Outputs	Delivery Date	Description
ESMP - Estuary Shoreline Management Plan	Initial planning Report	10 /97	Detailed project plan
	Environmental Baseline Study	8 /98	GIS-based data access system
	Interim Report	7 /98	
	First consultation period	8-10 /98	Issues and processes described
	Second consultation period	5-7 /99	Opportunity for outside input into the plan
	Final Report	8 /99	Interim management plan completed
Geomorphological Studies - phase 2	Preliminary Report	5 /98	Detailed project plan
	Interim Report	11 /98	Process model results
	Final Report	5 /99	Scenario testing results
Joint Probability Analysis/Tidal database	Final Report	6 /98	Determine water levels around Estuary for design purposes
Archaeological audit	Final Report	5 /98	Archaeological and cultural heritage reference manual

Using The Work For Decision-Making

This work will guide the Agency's future work and decision-making and will have an important influence on planning around the Estuary (see Key Issues 1 and 3).

The Agency will:

carry out geomorphological studies to develop an improved understanding of the Estuary sedimentary processes and morphology of the Estuary and how the processes interact. Stage 2 of this work commenced in February 1998 and will culminate in the development of a number of mathematical process models and the testing of a wide variety of scenarios (eg the impact of changed dredging regimes). This work will be completed by mid 1999 and will be fed into the ESMP.

May 1999

build and verify models within a programme of geomorphological studies which can be used in the consultation process with other agencies in determining a long term approach.

May 1999

develop an ESMP with the advice of a Steering Group comprising key organisations. The primary aim for the ESMP will be to establish the future alignment for flood defences around the Estuary. The work was started in July 1998 and will be completed by

August 1999

complete the other studies listed in Table 1.



The Humber is a highly engineered channel. Past and continuing activities of land reclamation, warping and the construction of jetties, training walls and sea defences, all influence and constrain the natural development of the Estuary's form by directly or indirectly disrupting the sedimentary processes. Careful consideration must be given to all developmental proposals which have the potential to influence the movement and distribution of sediment.

We need to ensure that the physical processes linking the Estuary and adjacent open coastlines are understood and considered in strategy development and land use planning.

KEY ISSUE 3

Background

The future development of the Estuary is dependent on a full understanding of the physical processes which shape it. It is important for both land use planning and in the development of a long-term, usable flood defence strategy. A number of studies are underway, or will be undertaken to provide the information necessary for developing long-term plans and these are described more fully in Key Issue 2.

The need for a long-term flood defence strategy has been highlighted through concerns about the effects of flood defence work not just at the local level, but on the Estuary as a whole. The importance of the Estuary as a conservation resource strengthens the need for working on a basis which safeguards all of the Estuary's assets.

Considerable research now exists into the behaviour of estuaries as well as considerable data and information on the Humber Estuary itself. If the Agency is to devise a flood defence strategy, capable of achieving maximum acceptance, we must consider this research and environmental information properly.

Key Issue 2 mentions some of the study areas being looked at. Figure 3 shows how those studies will be put together to provide a sound basis for developing an Estuary Shoreline Management Plan and subsequent strategic environmental assessment.

Consultation has been a major influence in the development and planning of the Estuary Shoreline Management Plan (ESMP), and the projects which comprise the ESMP and related studies are led by a steering group of interested bodies including Local Authorities, conservation interests, agriculture and others.

At the same time, these developing strategies must be considered in land use planning. The Agency's actions on this are discussed more fully in Key Issue 1.

Aerial View of
Spurn Point.



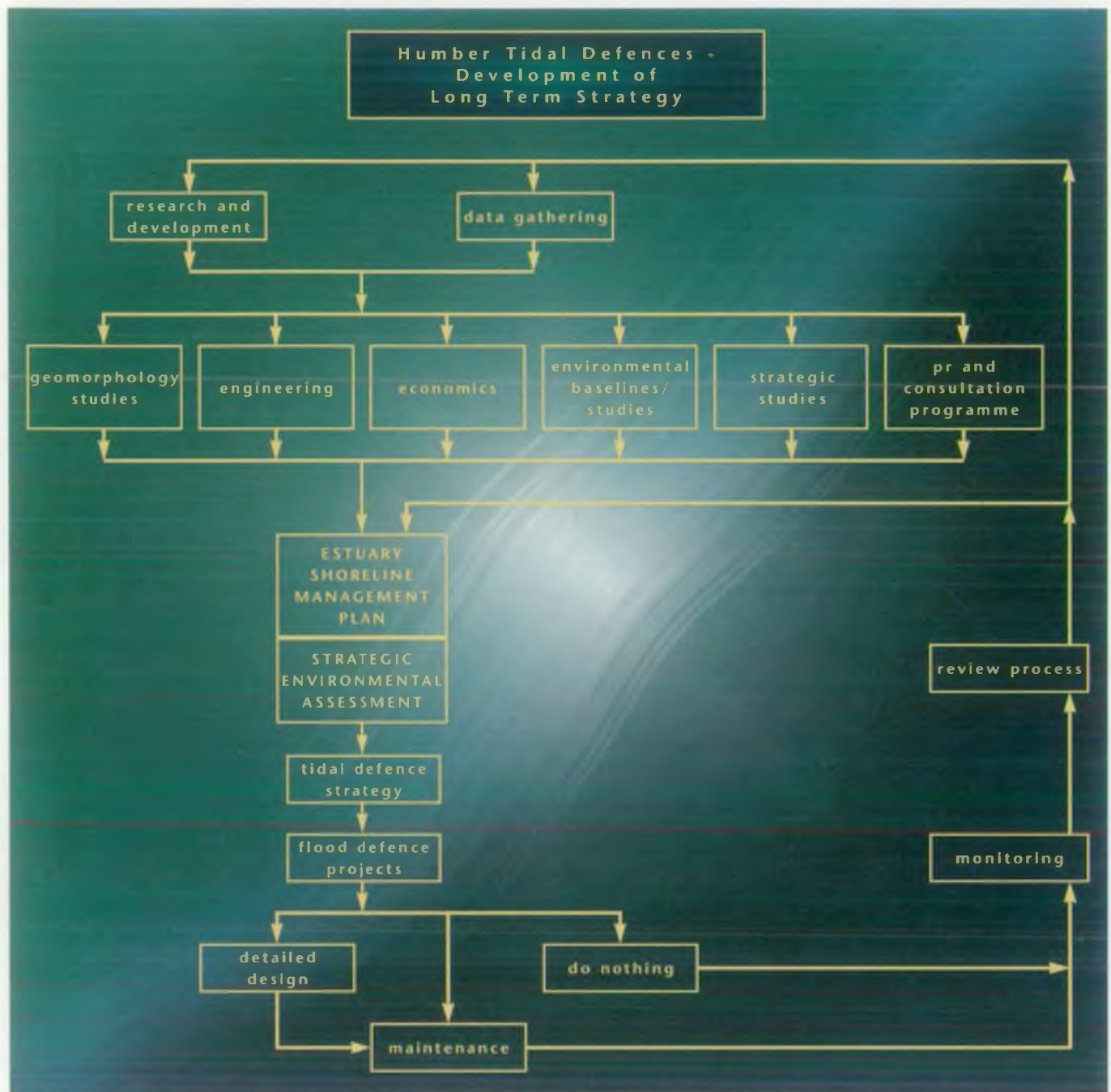


Figure 3

Objectives:

promote a sustainable approach to our management of the shoreline. In the long term, consideration should be given to working with and facilitating natural processes.

set up a partnership between responsible bodies (MAFF, English Nature, Local Authorities, conservation bodies and agriculture interests) to ensure that flood defences are managed on a long term basis to address the effects of sea level rise and 'coastal squeeze'.

adopt the precautionary approach in respect of physical processes until adequate information is available to guide management of the Estuary, although urgent works to maintain the integrity of flood defences will still need to be done (see Key Issue 5).

promote and participate in further investigations into the interactions between the coastline of Eastern England and the Southern North Sea as a whole.

The Agency will:

-
- prepare an Estuary Shoreline Management Plan and carry out geomorphological and other studies to help develop sustainable flood defence management policies and practices. Sea level rise will be one of the factors taken into account (see Key Issues 2 and 4). 1998 - 2000
-
- in the short term, carry out urgent works using procedures agreed with our key partners. These procedures include the precautionary principle as a fundamental guidance (see Key Issues 2 and 5). 1998-2003
-
- develop educational facilities which explain sea level rise, global warming and 'coastal squeeze' and what actions can be taken. 2000
-
- carry out research with other key organisations to make sure we fully understand any new information about any of these major concerns. 1998 onwards
-
- link our Strategic Studies (Estuary Shoreline Management Plan and Geomorphological studies) with the completed coastal Shoreline Management Plans carried out by Humber Estuary Coastal Authority Group (HECAG) and Anglian Coastal Authority Group. 2000
-
- work with local agencies and research institutes whose work and information have a potential impact upon the development of a long term strategy. 1998 onwards
-
- continue to support the Steering Group which advises the Agency on the production of the ESMP and contains representatives from all key organisations. Ongoing
-
- consult widely over the development of the long term strategy, so that all those who wish to have an input can do so. 1998 onwards
-



The Agency will carry out a strategic environmental assessment of the ESMP as part of the development of the long-term tidal defence strategy.

KEY ISSUE 4

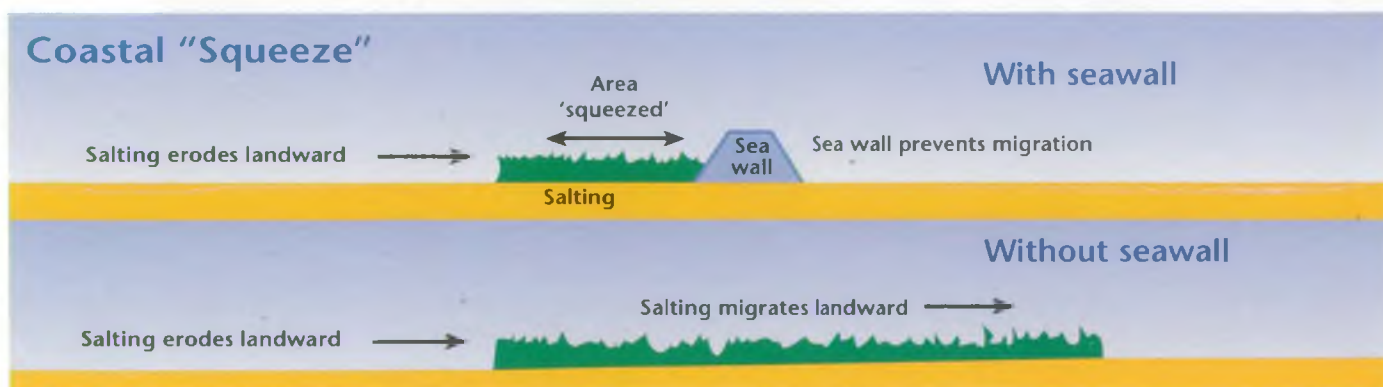
Background

Sea level is rising relative to the land due to the combined effects of changes in the height of the land mass since the last ice age and the influence of global warming. The rise is estimated to be 5-6mm per year in the 21st Century. Climate changes may lead to increased storminess, with consequent effects on flooding, erosion and deposition. Existing habitats provide a valuable feeding resource for fish and internationally important bird populations and we need to understand better the potential effects sea level rise and storminess may have on these.

Loss of inter-tidal areas would also result in increased wave height, with flood defences coming under attack, becoming more susceptible to erosion and therefore increased maintenance expense. Without action, increasing tide levels in the Estuary will decrease the effective standard of flood defence, which will in turn reduce protection levels. This will lead to a greater risk of tidal flooding in all areas and will put people at risk, influence property and agricultural land value, business confidence and investment.

Sea level rise could have implications for the efficiency of gravity drainage because any increase in tide levels in the Estuary will reduce the time available for natural gravity outfalls to drain. To maintain effective drainage of the highly productive farmland, more expensive options such as pumping stations and flushing ponds may be required, increasing land drainage costs.

We do not know whether the build up of intertidal habitat will keep pace with the predicted rate of sea level rise. If it does not, then the area of inter-tidal mud flats and salt marshes is likely to reduce especially where sea walls provide a demarcation between these and reclaimed land. This process is known as Coastal Squeeze.



Loss of inter-tidal habitat resulting from sea level rise and coastal squeeze may put further pressure on flood defences by adding increased wave height on to increased water levels.



Objectives:

promote a sustainable approach to our management of the shoreline. In the long term, consideration will be given to working with and facilitating natural processes.

set up a partnership between responsible bodies (MAFF, English Nature, Local Authorities, conservation bodies and agriculture interest) to ensure that flood defences are managed on a long term basis to address the effects of sea level rise and coastal squeeze.

adopt a precautionary approach in respect of physical processes until adequate information is available to guide management of the Estuary, while still undertaking urgent works to maintain the integrity of flood defences.

promote and participate in further investigations into the interactions between the coastline of Eastern England and the Southern North Sea as a whole.

The Agency will:

prepare an Estuary Shoreline Management Plan, taking into account sea level rise (see Key Issues 2 and 3).

in the short term, carry out urgent works using procedures agreed with our key partners. These procedures include the precautionary principle as a fundamental guidance (see Key Issues 2, 3 and 5). Ongoing

part of the precautionary approach will include working with the Local Authorities to look at areas of land which may not be defendable in the long term (see Key Issues 1 and 2).

develop educational facilities which explain sea level rise, global warming and coastal squeeze and what actions can be taken. 2000

carry out research with other key organisations to make sure we fully understand any new information about any of these major concerns. 1999 onwards

We need to protect people, property, key areas of land and infrastructure from flooding and maintain conservation. We also need to determine how to balance these requirements in providing long term effective and sustainable tidal defences.

KEY ISSUE 5

Background

The Environment Agency is responsible for flood defences along most of the shore of the Humber Estuary. Maintenance of these is of considerable economic and environmental importance. Determining a long term strategy for the Estuary as a whole will ensure the best direction in terms of both environment and cost - effectiveness (see Key Issues 2 and 3). However, this will take time and in the meantime, flood defence work is essential to protect people and property from flooding.

A balance must be achieved between the effect of flood defences on natural processes, conservation and their socio-economic benefits. Several options are available to provide effective flood defences. These range from enhancement of natural processes using for example, managed realignment, to the construction of hard defences such as sea walls or a mixture of these. The strategic studies and plans outlined in Key Issues 2 and 3 will ensure that we develop an estuary wide strategic flood defence programme.

The key factors in developing an acceptable long term flood defence strategy have been discussed in Key Issues 2, 3 and 4; the Agency is committed to investigating them and incorporating the findings into the resulting strategy and urgent flood defence works. The Agency has already produced a set of procedures for urgent flood defence work which ensure that all work carried out on the Estuary is done in a consistent and open manner with opportunities for people to comment on the problems, issues and proposed actions. This is particularly important for maximising opportunities to promote recreation, conservation and landscape features (see Key Issues 2 and 11) as well as ensuring that archaeology sites are properly considered and protected.



Consultation is a key part of the process of developing flood defence work. Through consultation we can ensure that all the main issues are properly recognised at the outset and taken into account during the development and selection of the right option. Consequently schemes are prepared which benefit the environment as well as being cost effective and technically correct.



Flood defences around the Estuary comprise 230kms of embankments, walls and drainage structures. Together, they play a massive role in maintaining the economic and environmental well-being of the Estuary. They also reflect patterns of reclamation and man's use of the Estuary over the last thousand years.

Objectives:

ensure that valued and vulnerable environmental resources are protected. All schemes will be designed to protect the international conservation status of the Estuary under the European Habitats Directive.

support the estuary-wide economic and baseline studies being carried out to supplement existing knowledge during the ESMP process.

actively involve the agricultural community and local interest groups in the drafting and formulation of the flood defence initiatives (such as the ESMP) to minimise the effects of any perceived land blight.

promote a comprehensive evaluation of the impact of the loss of agricultural land and the socio-economic consequences of each viable flood defence option when assessing flood defence options for agricultural land.

ensure that agricultural land is valued in the light of both our current and future needs for growing food. The desire to protect high quality agricultural land on the Humber banks should be balanced against the need to use land for other purposes.

promote and encourage the minimisation of noise and pollution and disruption by traffic on wildlife and people when undertaking engineering works.

THE AIMS OF FLOOD DEFENCES ARE -

To reduce the
risks to
people,
property and
the natural
environment
against
flooding
from
rivers and
sea

To provide
adequate
arrangements
for flood
forecasting
and warning



All works are designed with Environmental Action Plans; These explain the environmental pressures of schemes and what actions will be undertaken as part of the work to ensure environmental protection and enhancement.

Urgent Works

Urgent work is being carried out at a number of sites around the Estuary (see Figure 4) - some of these will require work in the near future but others will be deferred where the urgency is less great awaiting development of the long term strategy.

The urgent works procedures have been developed for use by all three Environment Agency Regions around the Estuary. They ensure consistency of approach, clarity of the process behind the planning development and implementation of schemes and demonstrate whether works are sufficiently urgent enough to require action before the development of the long term strategy. The development of these procedures involved extensive consultation; adhering to them is an important part of the project appraisal process.



Figure 4. Map of urgent flood defence works.

The Agency will:

carry out flood defence work in line with objectives identified with MAFF and English Nature.	Ongoing
produce a long term strategy for flood defence through wide consultation (see Key Issues 2 and 3).	
carry out urgent flood defence works in line with procedures which ensure that work is done in an open and easily followed manner.	Ongoing
defer flood defence work which is not required urgently. This ensures that essential works are given the highest priority, whilst those less urgent will be undertaken as part of the strategy.	Ongoing
produce environmental Action Plans for each scheme following consultation. These will commit us to the protection and improvement of the environment based on enhancement guidelines produced by the Agency and the Humber Biodiversity Action Plans.	Ongoing
continue to improve its flood warning service.	Ongoing
monitor the state of the flood defences in a routine and consistent manner to ensure that the urgent works are identified as soon as possible.	Ongoing
examine all proposals for flood defence work to make sure that the final option does not prejudice the implementation of the long term flood defence strategy in preparation.	Ongoing



Conservation and the enhancement of the environment are an important part of flood defence work. The Agency has developed a programme of environmental opportunities which are built into flood defence works where appropriate.

KEY ISSUE 7
KEY ISSUE 8
KEY ISSUE 9
KEY ISSUE 10
KEY ISSUE 11
KEY ISSUE 12
KEY ISSUE 13

Background

The Humber and its environs are of considerable importance for conservation.

In carrying out any of its functions the Environment Agency is committed to maintaining conservation and, where possible, improving wildlife. This approach is carried out on an estuary-wide basis and is increasingly carried out to achieve objectives identified as part of the Biodiversity Action Plan currently being prepared (see Key Issue 1).

We recognise the need for continued economic growth around the Estuary and are committed to working in partnership to see the development of appropriate industry and ports. The Agency provides technical guidance on all aspects of its work as part of the consultation process. We will continue to do so more effectively with findings from the long-term studies and approaches taken across the whole range of Agency activity.

The Environment Agency has produced guidance on environmental enhancements which will be of particular benefit to the Humber Estuary. This work was primarily designed to provide advice for works on flood defences. It was produced through extensive consultation with conservation bodies and is also heavily influenced by the developing Humber Biodiversity Action Plan (see Key Issue 1).

The Agency is committed to a principle of no nett loss of environmental resources and is involved in a number of projects which are contributing to conservation directly and indirectly through flood defence and other work.



The Agency has worked closely with Lincolnshire and Humberside Wildlife Trust in recent years to restore open water and reed bed habitats in Barton Clay pits. The area is of national importance for its bird life and the work has led to improvements in the numbers of species such as water, rail and bearded tit. We hope this work will lead to bitterns breeding here again.



Collaborative work with RSPB and Lincolnshire and Humberside Wildlife Trust has improved the habitats on Read's Island.



Objectives:

avoid actions which may adversely affect, either directly or indirectly, the habitats which support nationally and internationally important populations of bird species.

restore degraded sites where practical, and identify new sites for habitat creation to offset habitat loss.

ensure that timing of new works minimises the disturbance to birds by avoiding roosting, feeding and breeding areas at certain times of the year or states of the tide.

encourage farming practices which maintain or enhance the nature conservation value of agricultural land and landscape interest of farm holdings.

continue to evaluate fully the potential effect of new development on conservation interests through the planning process and Environment Assessment.

adopt a policy of no nett loss of inter-tidal habitat as a principle for facilitating development needs within the Estuary, without compromising the integrity of the SPA.



Figure 5. Map of Conservation Sites of National, International and Local significance.

The Agency will:

undertake Environmental Assessment of all our proposed works within the Estuary and take into account wider environmental implications of our work throughout the Estuary as a whole.

Continuous

review all permissions which could be influenced by the Habitats Directive. We will continue supporting a group which has been formed to start the process of developing a Biodiversity Action Plan (BAP) for the Humber which includes English Nature, Local Authorities, RSPB, the Wildlife Trusts and the Agency. The Plan will help identify the conservation objectives which we and others need to target as part of any actions.

1999

produce Environmental Action Plans which describe the way in which our works will be carried out to avoid damage to the environment and where appropriate improve it, particularly for flood defence works.

Continuous

fund a Farming and Wildlife Group Advisory Post in East Yorkshire which will specifically promote farming and land use practices minimising pollution, reducing impacts upon the surface and groundwater quality and identify positive conservation benefits.

This is funded for 1998-99 at a cost of £19.5k

promote conservation enhancement through strategic land use planning. We will work with the unitary authorities to ensure that Agency interests are fully taken into account in the planning process. We will examine development plans and be prepared to justify our proposals at appeals when necessary (see Key Issue 1).

Continuous

develop a more positive approach to Estuary wide mitigation and produce an Estuary wide guidance note in conjunction with others on enhancement opportunities.

Ongoing



Environmental Enhancement and Mitigation.

The Environment Agency has produced guidance on environmental enhancements which would be of particular benefit to the Humber Estuary. This work was primarily designed to provide advice to engineers carrying out works on the flood defences. It was produced through extensive consultation with conservation bodies and is heavily influenced by the Humber Biodiversity Action Plan which is currently in preparation.

We need to ensure that water quality in the Humber Estuary is improved to comply with National and European standards, and to encourage effluent dischargers to adopt Integrated Pollution Management.

KEY ISSUE 7

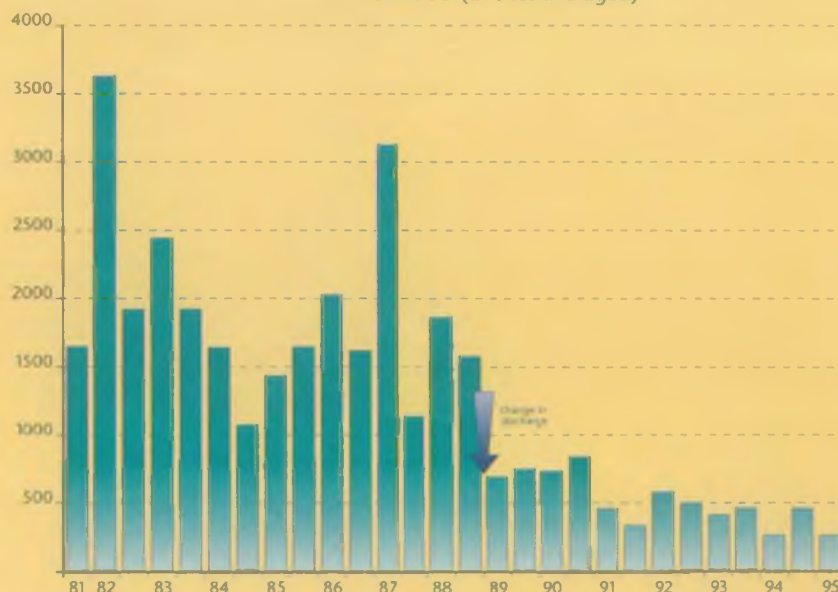
Background

The overall quality of the Humber Estuary is determined largely by the quality of the rivers draining via the Yorkshire Ouse and Trent systems. The Trent river input is of fair quality and meets its target standards but those from the Ouse require considerable improvement.

The most serious pollution is the severe depletion of dissolved oxygen at times in the tidal Ouse - a long standing problem caused by discharges of inadequately treated sewage and industrial effluents into the lower reaches of the Ouse system and from the industrial river systems of Yorkshire. Other contributing influences are the discharges of metals to the Estuary which, whilst meeting the appropriate Environment Quality Standards, are high in comparison to many other estuaries, and relatively high levels of nutrients - nitrogen and phosphorous - within the system.

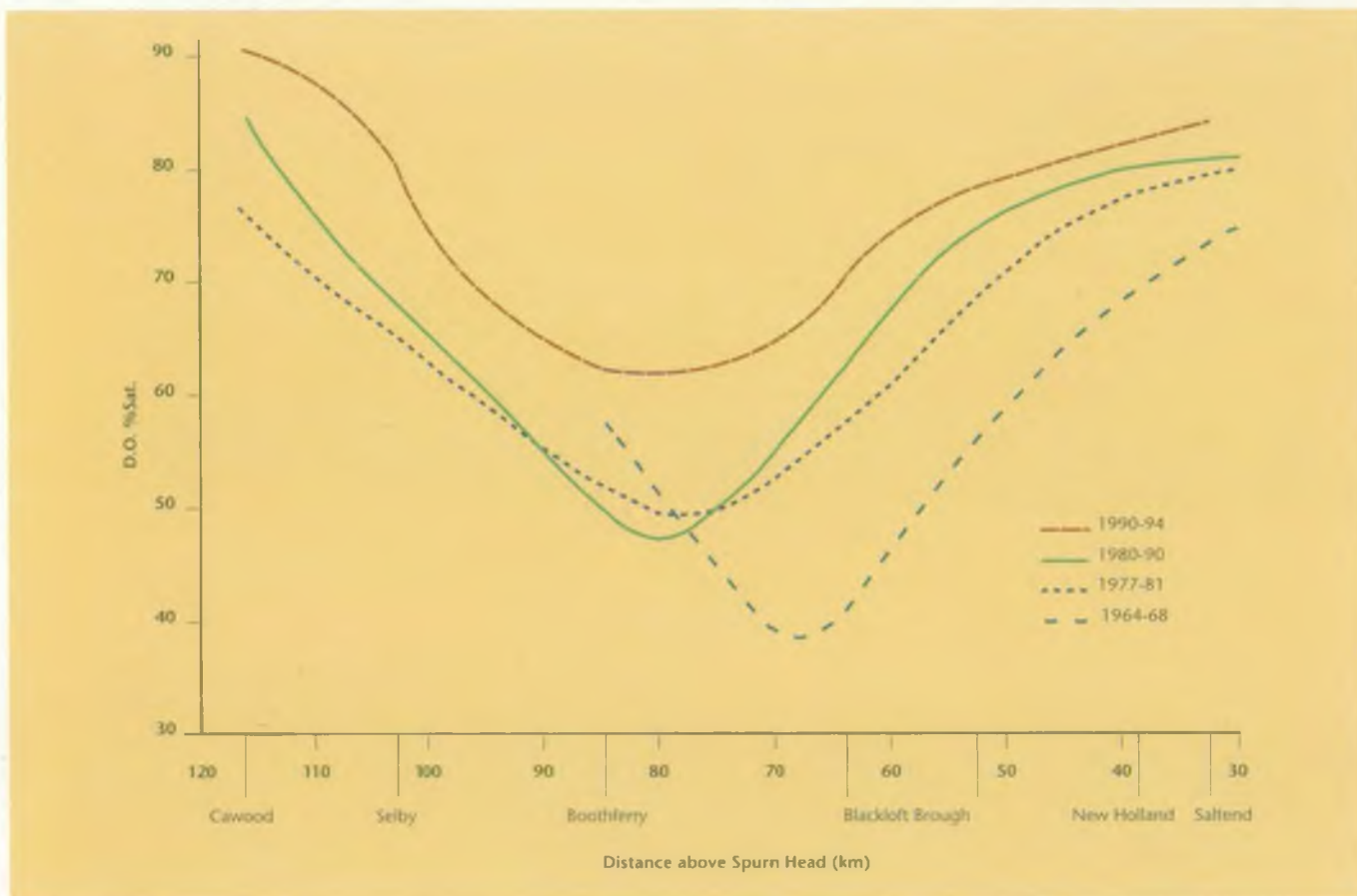
Despite these concerns the quality of water as indicated by the present Estuary Classification system is generally good and indicators suggest it's improving.

Iron levels in *Fucus* (Mg/Kg, Dry Wt)
1981-1995 (all sites averaged)



As part of the Humber Estuary Environmental Quality monitoring programme, levels of heavy metals in the brown alga *Fucus vesiculosus* have been measured since 1981.

In August 1988, new arrangements were implemented for the discharge of the large quantities of acid - iron waste from the two Titanium dioxide factories situated between Grimsby and Immingham. The histogram shows how the levels of iron were greatly reduced - and that this improvement has been sustained.



Comparison of Dissolved Oxygen profiles in the Ouse-Humber System.

Dissolved Oxygen Concentrations

Low concentrations of dissolved oxygen have long been a problem in the Humber Estuary, particularly around Trent falls in times of warm weather and low freshwater flows. Substantial action by the Agency and its predecessors has gone into reducing potentially polluting discharges entering the Estuary. The results and benefits are highlighted in the chart above which clearly shows a reduction in the Dissolved Oxygen DO sag over the past three decades and an overall increase in the DO levels within the system.

The DO sag will never be completely eliminated but its reduction has helped begin to remove the major barrier to fish migration in the Humber and salmonids have recently started to return to the tidal River Ouse. The significant environmental improvement reflects the considerable expenditure by the principal dischargers and substantial effort by the Agency.

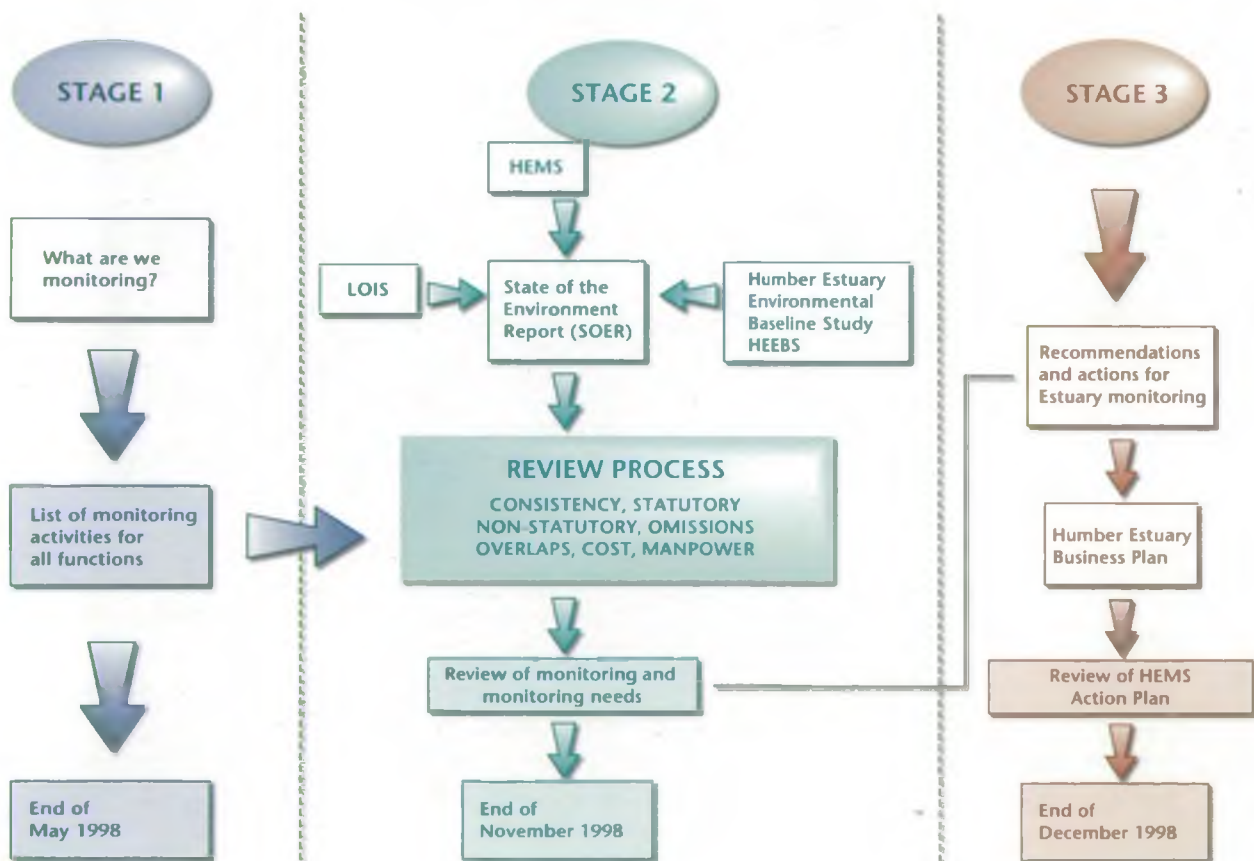


In line with a Government Commitment to reduce the discharge of Dangerous Substances to the North Sea (by 50% of the 1985 emission levels) we have been working with industry to achieve this.

The Agency regulates the discharges from the potentially most polluting industrial processes using Integrated Pollution Control. We authorise such discharges applying the principle that the Best Available Techniques Not Exceeding Excessive Costs (BATNEEC) are used by these processes to minimise their impact upon the environment.

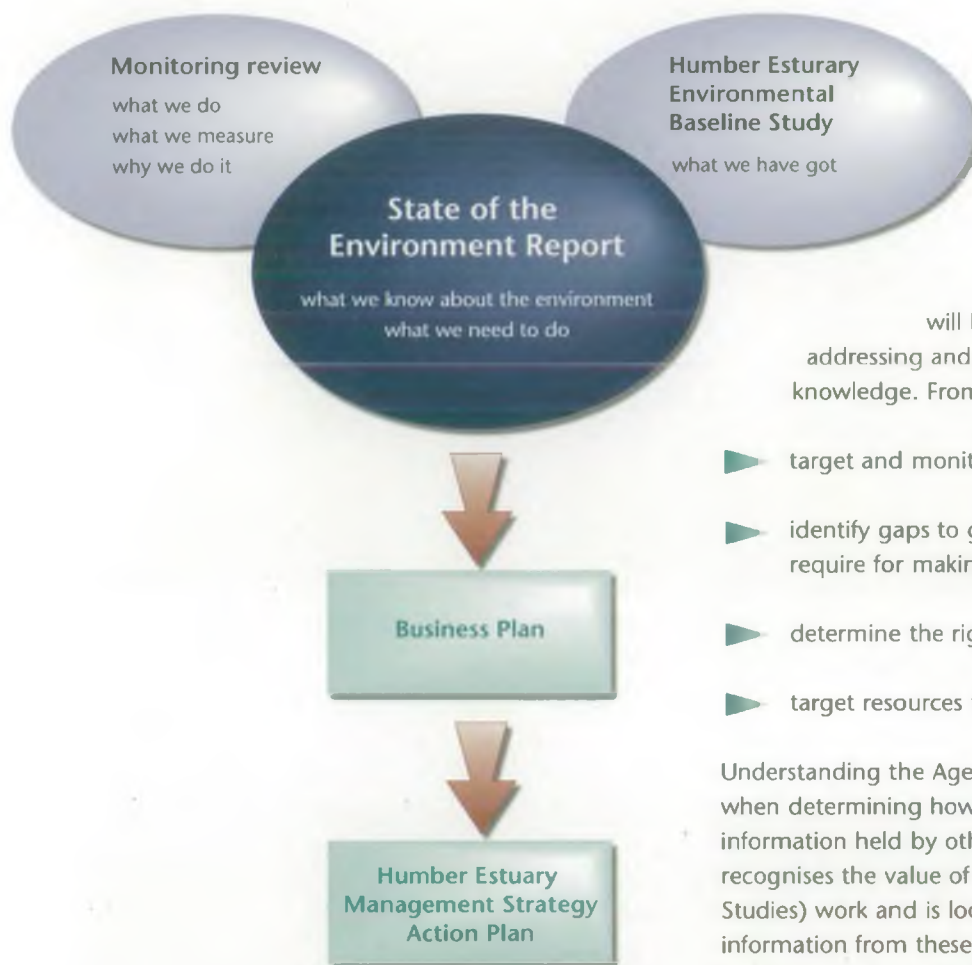
The Agency is currently preparing a State of the Environment Report for the Estuary. Measuring the state of the environment is a fundamental aspect of the Environment Agency's environmental management role. It provides the basis for producing information on the environment, assessing priorities for action and charting progress against environmental management plans and targets.

The Agency's success will be judged on how its direct action protects and improves the environment.



Monitoring Review - Programme of Work

The Agency is currently reviewing its monitoring of the Estuary to ensure that all work on the Estuary is co-ordinated and cost-effective. The diagram above shows the process and the timetable for the review.



The **monitoring** review, in conjunction with the State of the Environment Report and Humber Estuary Environment Baseline study specific to the Humber Estuary, will help clarify the issues that need addressing and also highlight any gaps in knowledge. From this the Agency can:-

- ▶ target and monitor activities to estuary-wide needs
- ▶ identify gaps to gather the correct information we require for making the right decisions
- ▶ determine the right actions, and
- ▶ target resources to the right areas

Understanding the Agency's own activities is also essential when determining how best to use the wealth of information held by others. For example, the Agency recognises the value of the LOIS (Land Ocean Interaction Studies) work and is looking at ways of maximising information from these studies, which are being carried out by a number of Universities and research establishments.



Figure 6

Humber Estuary Dissolved Oxygen Levels and Classification Score in 1997 and modelled for 2005 with improvements

Figure 6 shows the level of dissolved oxygen in the Estuary. Clearly, there are some areas where this is unsatisfactory. The list of improvements given in Table 2 have been designed by the dischargers to help us meet satisfactory standards throughout the Estuary. Figure 7 models the future status of the Estuary once the improvements have been completed.



Figure 7

Water Quality Improvements

Against the background of considerable improvements to water quality industry continues to invest in further improvement. The table following lists the most important of these and demonstrates the enormity of the workload as well as the commitment to achieving it.

Table 2

Action	Company	Completion Date
Aire and Calder Catchments		
Tertiary treatment, Halifax STW	Yorkshire Water Services	2000
Tertiary treatment, Mitchell Laithes (Dewsbury) STW	Yorkshire Water Services	2000
Tertiary treatment and reconstruction, Brighouse/ Huddersfield STW	Yorkshire Water Services	1998
Additional secondary treatment, Knostrop (Leeds) STW	Yorkshire Water Services	1999
Ammonia reduction, Wheldale STW	Yorkshire Water Services	2000
Provision of secondary treatment, Snaith STW	Yorkshire Water Services	2000
Effluent treatment plant	Hickson and Welch	2000
Reduction in Organic phosphate insecticides	Wool Scouring firms	2000
Tertiary treatment, Esholt (Bradford) STW	Yorkshire Water Services	1996
Don Catchment		
Sandall STW, provision of additional secondary treatment	Yorkshire Water Services	2000
Provision of secondary treatment, Thorne STW	Yorkshire Water Services	1997
Lundwood STW, provision of additional secondary treatment	Yorkshire Water Services	1998
Ouse Catchment		
Enhancements to Naburn STW	Yorkshire Water Services	2000
Provision of secondary treatment, Selby STW	Yorkshire Water Services	2000
Provision of sewage treatment works for Goole	Yorkshire Water Services	2000
Review of process discharges to the environment	Haarman & Reimer	on-going
Reduction in load through stepped consents	BOCM	2000
Reduction in load through stepped consents	Rigid Paper Products	2000
Review of consent to discharge	Hazelwoods	on-going
Trent Catchment		
Reduces effluent load Retford STW	Severn Trent Water	1998
Enhancements Gainsborough STW	Severn Trent Water	2000
Improvements Scunthorpe STW	Severn Trent Water	2000
Humber North Bank and river Hull		
Provision of sewage treatment for Hull	Yorkshire Water Services	2000
Provision of sewage treatment for Brough and neighbourhood	Yorkshire Water Services	post 2000
Hedon STW	Yorkshire Water Services	2000
Beverley STW	Yorkshire Water Services	1999
Driffield STW	Yorkshire Water Services	1997
Review of process discharges to the environment	Croda	on-going
Review of process discharges to the environment	British Aerospace	on-going
Review of process discharges to the environment	BP Chemicals	on-going
Review of process discharges to the environment	Holliday Pigments	on-going
Review of process discharges to the environment	Hodgsons Chemicals	on-going
Review of process discharges to the environment	Anglia Oils	on-going

Table 2 continued

Action	Company	Completion Date
Humber South Bank		
ETP - Installation of oil-water separators	Associated Petroleum Terminals Ltd	Completed
ETP - suspended Solids Separation	British Steel, Immingham Terminal	Completed
Effluent Treatment Plant	Coal Products Ltd	Completed
Full Effluent Treatment Plant (includes bio plant)	Conoco Ltd, Humber Oil Refinery	Completed
Effluent Treatment Plant (o/w separation)	Conoco Ltd, Tetney Terminal	Completed
Effluent Treatment Plant	Courtaulds Fibres Ltd, Tencel	1998
Effluent Treatment Plant (Zinc reduction)	Courtaulds Fibres Ltd, Viscose	Ongoing
Effluent Treatment Plant (COD reduction)	Courtaulds Fibres Ltd, Courtelle	Completed
Effluent Treatment Plant (solids + o/w separators)	Courtaulds Fibres Ltd, Power	Completed
Effluent Treatment Plant (COD reduction)	Cray Valley Ltd	Completed
Effluent Treatment Plant (COD reduction)	Harlow Chemicals Ltd	Completed
Effluent Treatment Plant (pH)	Humber Power Ltd	Completed
Effluent Treatment Plant	Hydro Agri UK Ltd (Acids)	Completed
Effluent Treatment Plant	Hydro Agri UK Ltd (Fertilizer)	Completed
Effluent Treatment Plant (only partial IPC involvement)	Immingham Storage Co	Ongoing
Full Effluent Treatment Plant (includes bio plant)	Lindsey Oil Refinery Ltd	Completed
Effluent Treatment Plant	Millennium Inorganic Chemicals	Completed (some ongoing improvements as site develops)
Effluent Treatment Plant	National Power Plc	Completed (further improvements planned)
Full Effluent Treatment Plant (includes bio plant)	Novartis, Grimsby	Completed
Effluent Treatment Plant	Powergen Plc	Completed
Effluent Treatment Plant	Revertex Chemicals Ltd	Completed
Effluent Treatment Plant (solids separation + o/w separation)	Rugby Cement Ltd	Completed (ongoing improvements as site develops)
Effluent Treatment Plant	Synthomer Ltd	Completed
Effluent Treatment Plant	Technical Absorbents Ltd	Completed
Effluent Treatment Plant	Tioxide Europe Ltd	Completed
Effluent Treatment Plant	Tioxide Europe Ltd	Completed
Pyewipe STW	Anglian Water Services	Projected Q2 1999 (obligation - December 2000)
Newton Marsh STW	Anglian Water Services	August 1995
Immingham STW	Anglian Water Services	Post 2000

Objectives:

ensure that all waters are of a sustainable quality for their different uses.

deliver a continual improvement in overall water quality.

improve bathing water quality.

improve estuarine waters for shell fisheries.

continue the efficient and effective delivery of Integrated Pollution Control (IPC).

ensure improvements are made to the quality of discharges to estuarine and coastal waters.

implement the requirements of the Urban Waste Water Treatment Directive.



View from the Humber Bridge looking upstream.

The Agency will:

reduce pollution by enforcing discharge consents and IPC authorisation (based on BATNEEC and BPEO) and by encouraging industry to adopt waste minimisation.	Continuous
improve effluent treatment using Urban Wastewater Treatment Directive for Selby and Thorne STW and ensure the provision for the first time for Goole, Grimsby, Hull and Immingham by 31.12.2000 (action by AWS, YWS).*	
continue to improve water quality of Aire, Calder, Don, Rother and Dearne catchments.	Continuous
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.	Continuous
carry out pollution prevention inspections at appropriate sites in the catchment.	Continuous
ensure that industrial sites with high pollution risks are located in areas where pollutants can be easily excluded from surface and groundwater.	Continuous
ensure design and construction of new industrial sites minimise risk and that appropriate pollution prevention and control equipment is in place and tested.	Continuous
ensure adequate emergency procedures are in place, publicised and tested.	Ongoing
produce a State of the Environment Report (SOER) of the Estuary using the most up to date information.	August 1998
review the monitoring of the Estuary which is done by the Agency.	Winter 1998
use the information from this review and the State of the Environment Report (SOER) to identify a coordinated programme of monitoring which will be targeted, cost-effective and capable of demonstrating whether the Agency is achieving its duties.	Spring 1999

* see table on previous pages for specific effluents and dates for completion of work

There is a need to promote more widely the benefits of waste minimisation.

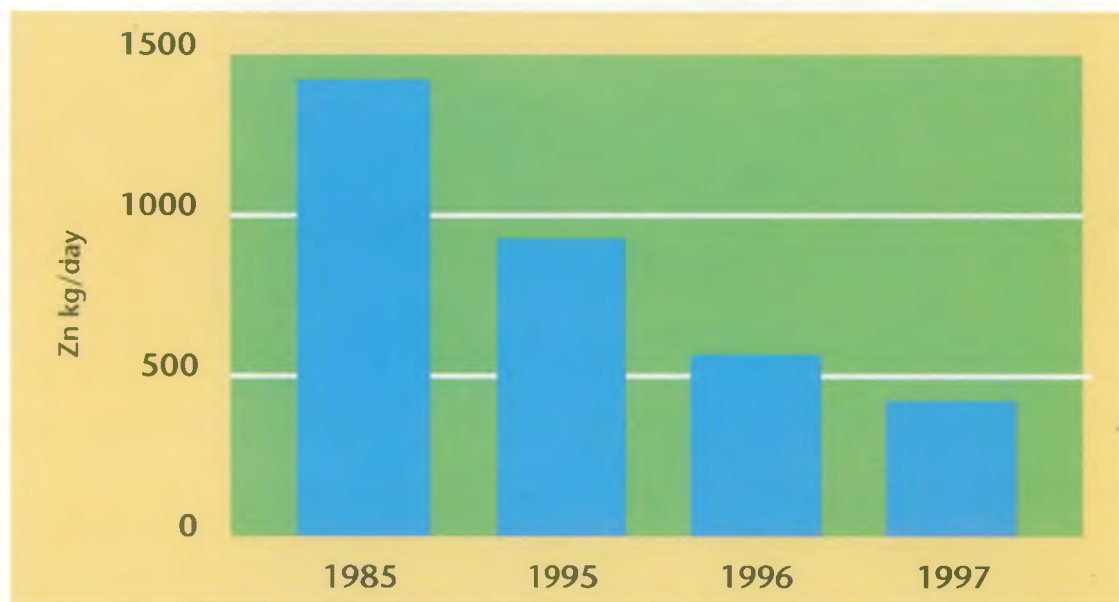
KEY ISSUE 8

Background

Waste production in the form of heat, gas liquid and solid matter is an inevitable consequence of industry, agriculture and society. We aim to reduce waste at source as much as possible making production of goods more efficient and changing the nature of products. This also reduces the exploitation of raw material, energy and water. Waste that cannot be eliminated may be able to be reused or recycled, and that left over must be rendered harmless before disposal to the environment.

Progress is being made in the Humber area with many organisations realising the financial and environmental benefits of adopting waste minimisation practices. There is an existing and increasing need for low cost environmentally acceptable waste disposal options.

Courtaulds Ltd have been required to reduce the zinc load discharged by 50 % from 1985 levels. The company has achieved this target by a combination of waste minimisation and recycling.



Waste Minimisation General

The Humber Forum Waste Minimisation Project confirmed the value of waste minimisation to a number of local companies e.g. Hodgson Chemicals, Swift Group Ltd and Knauf UK Ltd. A number of the companies involved in the initial project have now been used as successful case studies by the Environmental Technology Best Practice Programme. The Humber Resource Efficiency Centre is now building on this earlier success and offering support to local companies and promoting waste minimisation. They can be contacted at:

Commerce House, 62 Paragon Street, Hull, HU1 3PW

The Government's policy framework for the management of waste identifies ways in which waste can be managed in a more sustainable way, and sets targets for achieving that aim.

Objectives:

- to reduce the amount of waste that society produces - waste minimisation.
- to make the best use of the waste produced through re-use, recycle and recovery.
- to choose waste management practices which minimise the risk of immediate and future environmental pollution and harm to human health.



The Government's Producer Responsibility initiative will be a key tool for promoting the recovery of value from some wastes. It is designed to ensure that industry assumes an increased share of the responsibility for the waste arising from the disposal of its products. The most advanced producer responsibility scheme is for the packaging industry, for which the Government has set a target to recover 50-65% of packaging waste by 2001. A number of other industries are to set recovery targets.

Landfill Tax

The Landfill Tax was introduced on 1 October 1996 as a levy on the disposal of waste at landfill sites throughout the United Kingdom.

Its aims are:

- ▶ to ensure the environmental impact of landfill is properly reflected by disposal costs.
- ▶ to achieve more sustainable waste management by encouraging producers to reduce waste arising, increase recycling and dispose of less waste to landfill.

The Agency will:

provide a high quality waste regulation service.	Continuous
develop an overall database of waste arising and disposals.	1999
measure the effectiveness of taxation to reduce waste and to encourage its re-use and recycling.	Ongoing
implement the "producer responsibility" regulations.	1998/1999
develop life-cycle assessment methodologies for dealing with waste.	1999
encourage and inspire industry to develop new and improved techniques for the management of special and other industrial wastes.	Continuous
ensure achievement of national waste strategy targets for the reduction of waste disposed of to landfill.	Ongoing
ensure achievement of national targets for the recovery, recycling and composting of municipal waste.	Ongoing

We need to promote more widely the benefits of reclaiming areas of contaminated land, to reduce pressure on green field sites and to promote redevelopment for economic use and environmental gain.

KEY ISSUE 9

Background

Contaminated land is defined as any land which appears to a local authority to be in such a condition, because of the substances it contains, that it could cause or may already be causing water pollution or significant harm. Some sites may become designated as 'Special Site' and become the responsibility of the Agency. None as yet have been designated, as the Regulations that will bring the primary legislation into effect have not (at the time of writing) been finalised nor passed by Parliament.

Landfill sites that closed before 1994 when the new Waste Management Regulations came into force (which made the operator of a site responsible for its closure) may fall within the 'Special Site' definition.

Land is a valuable and finite resource; cleaning up contaminated land can bring economic and environmental benefits. Redevelopment schemes reduce the pressure on greenfield sites and can utilise existing infrastructure, minimise costs of road, rail, sewerage etc., and directly protect and enhance the Estuary's undeveloped areas.

Reclamation of contaminated sites reduces the financial burden for future generations of clean up costs associated with our industrial heritage. Difficulties do however arise when the ownership of land is unknown and the re-sale value of the land is less than the probable clean up costs. Clarification of the legislative framework and responsibilities 'orphan sites' and available financial support is urgently needed.

A reclamation programme must not cause pollution itself, and any waste generated must be disposed of in an acceptable way.



Beitag Contaminated land site.
The Agency is a partner in the
major programme of restoring
this land for re-use.

Objectives:

encourage or enforce remediation of priority sites.

provide a high quality waste regulation service.

prepare a national report on the state of contaminated land.

measure the effectiveness of taxation to reduce waste and to encourage its re-use and recycling.

Implement the "producer responsibility" regulations.

develop life-cycle assessment methodologies for dealing with waste.

encourage and inspire industry to develop new and improved techniques for the management of special and other industrial wastes.

ensure achievement of national waste strategy targets for the reduction of waste disposed of to landfill.

ensure achievement of national targets for the recovery, recycling and composting of municipal waste.

encourage waste minimisation at both non-regulated business and at Agency sites.

work with business, business support organisations and Local Agenda 21 groups to promote the principles and benefits of waste minimisation.

promote the work of Environmental Technology Best Practice Programme.

The Agency will:

work with the local authorities providing support and advice when bidding for funds to ensure appropriate remediation of contaminated land, eg. Waters Edge, Barton on Humber end 1998 and Macauley Lane (Grimsby) sites. Continuous

ensure appropriate remediation in consultation with others where sites are designated 'special' within the meaning of the Contaminated Land Regulations. Continuous

implement our policy and practice for the protection of groundwater, and seek support from Local Authorities and Developers. Continuous

exercise our pollution control powers to reduce the risk of future contamination. Continuous

work with Local Authorities to identify and report on the extent of contaminated land. Continuous

regulate identified special contaminated land sites effectively. Continuous


support any research into the specific risks and remediation risks of contaminated land. Continuous

reduce the environmental and economic burden of dealing with contaminated land by working with others on reclamation projects. Continuous

reduce the risk of further contaminated land sites developing in the future through planning advice. Continuous

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We need to ensure the sustainable economic development of the Estuary's ports, wharves and industrial base.



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**The port
facilities on
the Estuary
handle 65
million
tonnes of
cargo
annually**

Background

The ports and wharves on the Estuary and on the Ouse and Trent, which support the industrial base of the Humber area, are fundamental to the continued prosperity of the local and regional economy. The port facilities on the Estuary handle 65 million tonnes of cargo annually, some 18% of the total UK trade. Traffic through the ports may be expected to grow, influenced by the extension of the EU, increased inter-trading with the North Sea/ Baltic countries and greater collective competitiveness within the UK port industry.

The main industries relevant to the Estuary's environment are steel, engineering and chemicals. Other important sectors include service industries, fish and food processing, pharmaceuticals, telecommunications, print technology, paper products, caravan manufacture and tourism. In addition, the Humber area has rapidly established its position in offshore gas production; associated with this is increased power generation. The industrial base on the Humber contributes to a successful local and national economy which can enable investment to be made in environmental protection. The industrial base is also fundamental to the social well-being of the area in providing secure employment.

There are opportunities for further expansion and continuing investment in new and existing industrial and port/wharf facilities to accommodate increasing trade. Port and industrial operators in the area, and potential new developers bringing inward investment and employment opportunities, all value the nationally important resources of the Estuary. Undeveloped land alongside the Estuary is attractive for expansion of the existing sites and for new development including port, industrial, residential or commercial development e.g. retail and leisure. To support further development, the transport network may need to be improved. In the past 15 years, there has been investment in the road infrastructure of the region, but some parts of the Estuary road and rail network are considered deficient and further improvements remain uncertain.

Development may have direct and indirect effects on the natural regime of the Estuary, including sediment movement, accretion, erosion and flooding. Development of the Estuary's flood plain, much of which lies below high spring tide, is potentially at risk of tidal inundation. The siting of new developments may require the provision of flood defence measures and would need to be consistent with the guidance of PPG20: Coastal Planning.

Development opportunities within the Estuary lie close to or abut extensive areas of nationally and internationally important conservation areas, and development proposals must not affect the ability of these habitats to support nature conservation interests, especially birds. Ports and wharves will have to continue complying fully with the requirements of the Habitats Directive, addressing the environmental impact of works which might affect statutory designated sites.



Figure 8. Map of Industry and Ports.

The Agency will:

support Local Authorities and companies to grow and increase the competitiveness of the sustainable industrial base to secure employment opportunities.

support any move to promote a review of the transport infrastructure, including the development of short sea shipping, rail and inland waterways.

support any move to promote environmental best practice, adoption of the principles of sustainability and to engender an environmentally aware and responsible attitude in all sectors of industry and throughout companies workforce.

work closely with the Local Authorities and developers to ensure the right balance is struck between social, economic and environmental considerations in taking forward the concept of sustainable development. Ongoing

examine any proposals for development in line with our own strategy development and PPG20. Where appropriate we will also offer technical information derived through the development of the long term flood defence strategy. Continuous



The Environment Agency works closely with Associated British Ports throughout the Estuary.



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We need a framework to guide recreational management of the Estuary and its environs to ensure integration with other Estuary interests.

KEY ISSUE 11

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We need to ensure that current and future tourism on the Humber is on a sustainable basis.

KEY ISSUE 12

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Background

There are real opportunities to develop increased public access to the Estuary and its linked watercourses, as well as improving rights of way along the Estuary banks. Recreation improvements must not adversely affect other interests such as conservation and landowners.

The Environment Agency is committed to improving recreational facilities on Agency owned land and recognises that this is often achieved through partnership to maximise funding opportunities. The Agency does carry out work in its own right, and also examines the capital programme for flood defence work for opportunities to enhance recreation.



We encourage sensitive recreational use on Agency controlled land and enforce byelaws made under the Land Drainage Act to ensure access to flood defences does not damage their integrity at sensitive flora and fauna.

We have undertaken a study of opportunities and constraints associated with all Agency owned sites. This will identify a programme of opportunities for new and improved developments.

We produce Environmental Action Plans for flood defence work which describe the way in which the Agency will work to avoid and minimise damage to the environment and where appropriate improve it.



Figure 9. Map of Recreation and Tourism.



We have recreational duties to ensure that best use of land under our control is made available for recreational purposes. Management of flood banks is undertaken sympathetically and continue to improve access and the provision of facilities e.g. car parks. The balance has to be struck between recreation, operational use and conservation interests.



Objectives:

To promote access to the Estuary, taking into consideration:-

the need to maintain flood banks.

ownership of the land and the landowners co-operation.

multiple use of embankments to deliver appropriate landscape, farming, access, recreation and wildlife benefits.

access opportunities for different user groups are mutually compatible.

potential disturbance to roosting, feeding and breeding birds.

opportunities for landscape enhancement.

ease of access for emergency services.

to ensure that existing access and amenities in the countryside are maintained and enhanced where appropriate, through closer liaison between landowners and recreational groups.

to ensure that certain casual pursuits such as dog walking or the use of off road motor vehicles - particularly on flood defences, do not disturb or damage natural features of the Estuary, through careful management of access to the sensitive areas.

to promote practical conservation action that fosters respect and appreciation of the environment.

to ensure that the type and level of recreational use of an area is supported by the local community and is compatible with the environmental and economic interests.

the development of recreational facilities should be developed through broad consultation.

The Agency will:

develop opportunities for improving facilities through collaborative projects with a number of partners. Continuous

contribute to others proposals as appropriate through relevant consultation procedures.

complete a study of the recreational opportunities which exist on Environment Agency owned land. Summer 1998

use this study to identify opportunities and constraints associated with all our sites and will contribute towards ensuring that the type and level of recreational use of an area is supported by the local community and is compatible with the environmental and economic interests. 1999 onwards

produce environmental action plans for all flood defence works which examine opportunities for recreation as well as conservation (see Key Issue 5).

work closely with Local Authorities and others to ensure our contribution to the sensitive development of tourism. Ongoing

explore external sources of funding. Continuous

We need to enhance education and establish information exchange initiatives based on the HEMS region, and to encourage research and development work on many issues associated with management of the Estuary.

KEY ISSUE 13

Background

The Humber provides excellent opportunities to study and understand environmental processes and management for schools, higher education. Encouragement should be given to using the Humber Estuary as a classroom to illustrate natural history and its interactions with human activity.

The Environment Agency encourages anyone with an interest in the Agency's actions on the Estuary to have access to the data via the Public Register. We have already produced a number of leaflets and videos about the Agency's actions on the Estuary and more are intended in addition to this Action Plan.

A number of reports resulting from studies already underway are being produced and will be made widely available on completion. They include the Humber Estuary Environmental Baseline Study, a Review of Archaeology, a Review of Recreation and a summary of the actions undertaken to produce a flood defence strategy. As other work is completed, further studies will become available - these will include the Estuary Shoreline Management Plan and the State of the Environment Report.

The Estuary is a continually changing system, both naturally and as a result of human activities. We need to record these changes and their effects. A baseline of key information is vital to support decision making. Without an appropriate information base, it is not possible to monitor change, determine whether targets are being met or confidently predict future change. Good quality information is the key to effective management and furthering sustainable use by balancing the ability to make wise decisions about our future actions.

The Estuary is one of the most extensively monitored natural systems in the world. The Agency undertakes statutory monitoring to comply with UK and European legislation, and carries out extensive modelling to support decision making processes. In addition, other agencies, particularly research institutes, carry out a huge amount of work on a wide range of aspects throughout the estuary. It is important that this wealth of information is available in a format where it can be utilised by the Agency (see Key Issues 2, 3 and 7).

The Agency is working very closely with many of these institutions, most of whom have been doing work on aspects of the Land Ocean Interaction Study (LOIS) initiative to ensure that the information is produced and managed in a way that lets us monitor the environment properly and make effective decisions.

To ensure that the Agency's actions are appropriately planned, we are currently producing a State of the Environment Report which will tell us what we know about the Estuary, what we don't know, what the information means and what we have to do as a consequence to improve environmental quality. This approach will allow us to set targets which must be achieved if we are seen to be successful.



Objectives:

to ensure that appropriate and relevant information is widely available to: local communities, business and industry, visitors, educational institutions, planners, decision makers and developers.

to continue updating and publicising the Humber Estuary Bibliography, ensuring that it is widely available.

to encourage and promote organisations with specialist knowledge of the Estuary to communicate their research findings and monitoring work widely, making such findings readily accessible.

to provide key indicators of sustainability against which monitoring can be based.

The Agency will:

make environmental information more available by improving access to our Public Register. Additionally and specifically for the Humber, the Agency will produce a Humber State of the Environment Report by August 1998

publish other reports and information.

Continuous

ensure the research community has a role in advising the Agency on its actions through the Humber Estuary Scientific Advisory Committee which was formed in 1997 to advise us on the latest developments in the research world. The Committee meets twice a year to discuss a range of topics and identifies actions which may be undertaken by the Agency or by one of the research bodies.

Continuous



Biodiversity	Diversity of biological life, the number and abundance of species present.
Dissolved Oxygen (DO)	The amount of oxygen dissolved in water. Oxygen is vital for life so this measurement is an important indicator of the 'health' of the water.
Effluent	Liquid waste from industry, agriculture or sewage treatment plants.
Environmental Protection	Legislation controlling waste and protection of the Act 1990 environment including Integrated Pollution Control and waste regulation.
Geomorphology	Scientific study of land forms and of the processes that form them.
Hydrometry	Measurement of water.
Integrated Pollution Control	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. It applies to the most potentially polluting industrial processes, but not sewage treatment and disposal, or agriculture.
Integrated Pollution Prevention and Control	Similar in concept to IPC but includes a range of industries not covered by IPC. e.g. large sewage treatment works and waste management sites.
Intertidal	Refers to the region of the shore lying between the highest and lowest tides.
Landfill	The engineered deposit of waste into or onto land in such a way that pollution or harm to the environment is minimized or prevented and, through restoration, provides land which may be used for another purpose.
Managed Realignment	The realignment of flood defences in front or behind the existing defence line.
Minimum Residual Flow (MRF)	Target flow set locally and not legally defined.
Nutrient	Substance providing nourishment for plants and animals eg nitrogen, phosphorus.
Organic	Generally any substance containing carbon as part of its chemical make-up.
Plankton	Small plants and animals inhabiting the surface layer of the sea which form the basic resource of the water environment food chain.
Ramsar	Wetland site of International Importance that is designated under Ramsar convention (name of the town in Iran where the international convention was originally agreed in 1975 to stem the progressive encroachment on, and loss of, wetland).

Recycling	The use of waste products as material for new products.
Sewage	Liquid waste from cities, towns and villages which is normally collected and conveyed in sewers for treatment and/or discharge to the environment.
Sewerage	System of sewers usually used to transport sewage to a sewage treatment works, may also carry surface water run off.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Waste Minimisation	The reduction of waste and pollution at source by increasing the efficiency of production processes and the nature and formulation of products.

ABP	Associated British Ports
ACAG	Anglian Coastal Authority Group
BAP	Biodiversity Action Plan
BATNEEC	Best Available Techniques Not Entailing Excessive Costs
BPEO	Best Practical Environmental Option
CMP	Catchment Management Plan
EC	European Commission
EU	European Union
ESMP	Estuary Shoreline Management Plan
HECAG	Humber Estuary Coastal Authority Group
HEMS	Humber Estuary Management Strategy
IPC	Integrated Pollution Control
IPPC	Integrated Pollution and Prevention Control
LEAP	Local Environment Agency Plan
LOIS	Land Ocean Interactions Study
MAFF	Ministry of Agriculture, Fisheries and Food
OSPARCOM	Oslo Paris Commission
PIR	Process Industry Regulation
PPG	Planning Policy Guidelines
RSPB	Royal Society for the Protection of Birds
SINC	Site of Importance for Nature Conservation
SMP	Shoreline Management Plan
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
YWS	Yorkshire Water Service

Please Note: Maps and diagrams in this document are indicative only. Source: Environment Agency.

MANAGEMENT AND CONTACTS:

The Environment Agency delivers a service to its customers, with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

Head Office is responsible for overall policy and relationships with national bodies including Government.

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ENVIRONMENT AGENCY GENERAL ENQUIRY LINE

0645 333 111

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

ENVIRONMENT AGENCY EMERGENCY HOTLINE

0800 80 70 60



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