EA-Southern

ENVIRONMENT AGENCY

FACT FILES 6

River Adur

ENVIRONMENT AGENCY

Environment Agency - a better environment in England and Wales for present and future generations.

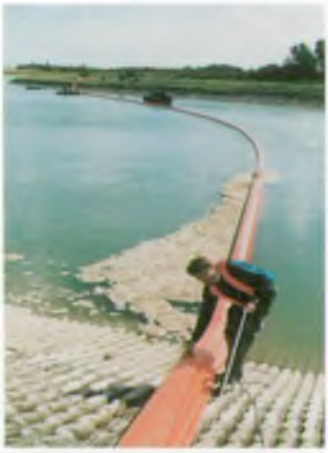
The Environment Agency is one of the world's most powerful environmental watchdogs, regulating air, land and water. As 'guardians of the environment' the Agency has legal duties to protect and improve the environment throughout England and Wales and in doing so contributes towards 'sustainable development' - meeting the needs of today without harming future generations.

Created by the 1995 Environment Act, the Agency started work in 1996. It is officially a 'non-departmental public body', which means that the organisation works for the public and has specific duties and powers.

The Agency has funding of about £585 million, 75 per cent of which is funded from its own charges and the rest from Government.

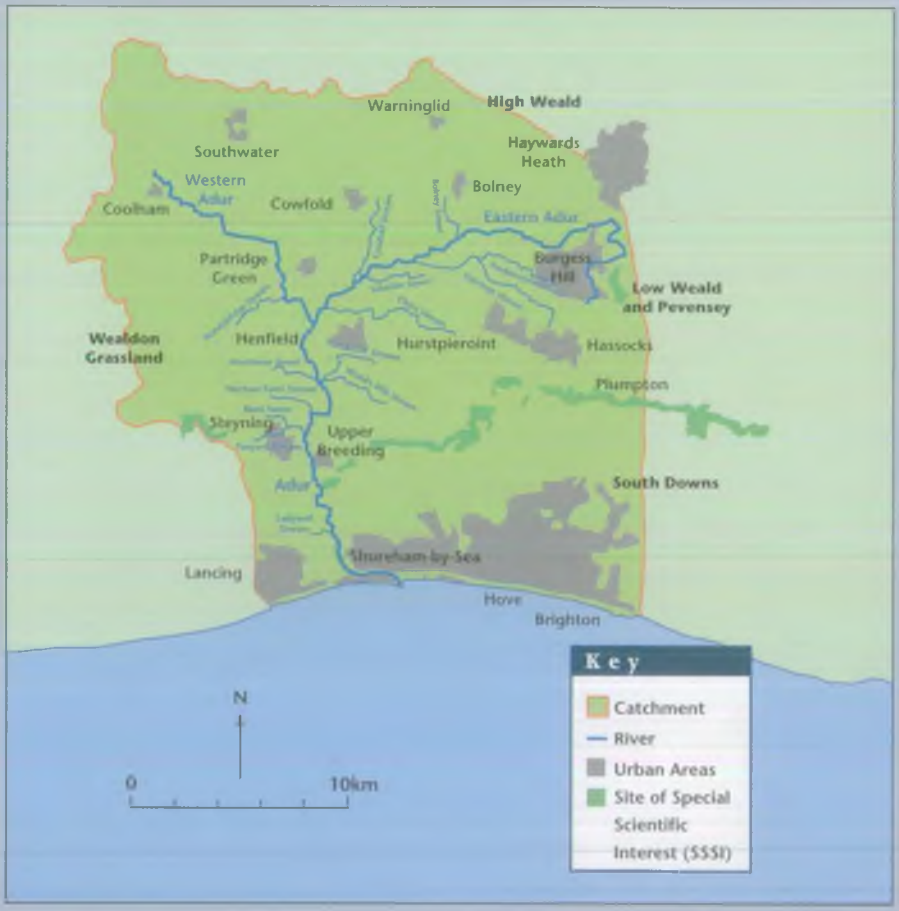
Nationally, around 15 million hectares of land are managed by the Agency along with 36,000km of rivers and 5,000km of coastline, including more than 2 million hectares of coastal waters.

There are eight regional offices, which are split into 26 area offices. Southern Region covers the counties of Kent, Sussex, Hampshire and the Isle of Wight.



Front cover photographs:
Main picture - New Shoreham from across the tidal harbour
Top inset - Shoreham Harbour
Bottom inset - Old Shoreham toll bridge and Saxon Church

River Adur


Warninglid
High Weald
Southwater
Haywards Heath
Western Adur
Bolney
Cowfold
Coolham
Eastern Adur
Partridge Green
Burgess Hill
Low Weald and Pevensey
Wealdon Grassland
Henfield
Hurstpierpoint
Hassocks
Plumpton
Steyning
Upper Breeding
Adur
South Downs
Shoreham-by-Sea
Lancing
Hove
Brighton
Key
Catchment
River
Urban Areas
Site of Special Scientific Interest (SSSI)
N
0
10km

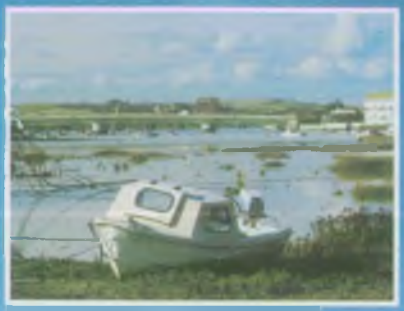
Historic Adur

The river we know today is a mere shadow of its former self, occupying a valley carved through the tundra in the Ice Age by a torrent of meltwater from the icecap north of London. At that time the land was much higher and sea level much lower than they are now. Since then erosion has softened the landscape and the river valley through the South Downs has filled with sediment as global warming and melting ice caused the sea level to rise. With no glaciers to feed it, our modern Adur serves only to drain the land within its catchment and its flow depends on rainfall, springs from the Chalk and, in the upper catchment, the input from treated effluents from population centres such as Burgess Hill.

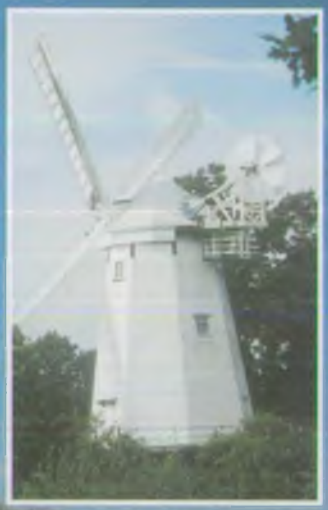
The river derives its name from the Celtic word Dwyr, meaning 'water'. The first record of the name Adur dates from 1612, previous names through the ages having been 'The Sore', 'The Beeding', 'Bramber Water', 'The Alder' and 'Shoreham River'. Names of watercourses and sluices sometimes show their past history, like the Tanyard Stream at Steyning, on the site of an old tannery, now long gone, or the Waterworks Sewer at Shoreham. In other cases, like Pocea Lea Sewer or Rooks Cross Sewer you can only speculate on how they came by their names. In the past 'sewer' did not mean foul water, as it does today, but was a general term for a drainage ditch.

Until the latter half of the fifteenth century the rivers Arun and Adur shared a common outlet to the sea at Lancing. Their estuary was separated from the sea by a long shingle bank similar to the one we see today at Aldeburgh in Suffolk. In time, the movement of shingle from west to east (longshore drift) pushed the mouth of the Adur towards Hove. The Arun independently broke through the shingle, which was subsequently devoured by the sea. The only reminder of earlier times is Widewater, on Lancing Beach, which follows the line of the earlier estuary.

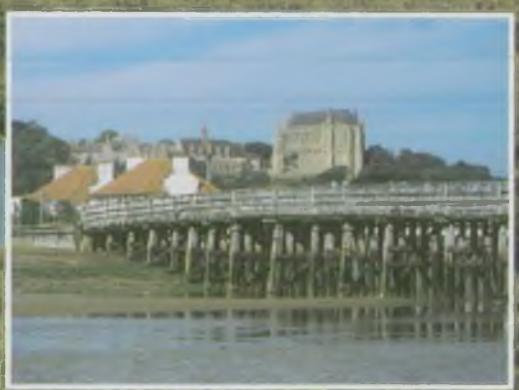
Toll Bridge and Old Shoreham Saxon Church



View up stream to Norfolk Bridge, Shoreham Airport and Lancing College



Shipley Windmill



Adur Toll Bridge and Lancing College

The Adur has been an important trade route since Roman times, with ports at Beeding and Old Shoreham. The Normans built Bramber castle to control trade, but as ships grew larger and the river silted up, inland centres withered to be replaced by New Shoreham early in the twelfth century. All that remained of Old Shoreham was its Saxon church, which still faces the Victorian Lancing College across the river. The wooden toll bridge is much more recent and was in use until 1970 (cars 6d per crossing) when it was replaced by the flyover on the A27.

New harbour entrances for the river Adur were cut through the shingle in 1760, 1775, 1800 and 1810, but all silted up. It was not until 1821 that the present river mouth at Kingston was established as a permanent feature, protected from longshore drift by its long breakwaters. Shoreham remains an important port on the South coast, administered by Shoreham Port Authority. It no longer handles coal for the power station or the bulk wine tankers which were a feature in the 1960s; today's principal cargoes are timber, refined oil for local distribution and gravel dredged from the sea.

Since the signing of Magna Carta in 1215 land below high water mark has been owned by the Crown for the benefit of the common people. However, land given away by the King before that date is privately owned. The tidal River Adur is claimed by the Duke of Norfolk, with the consequence there are no public rights of navigation or fishing. Permission for these activities should be obtained from Norfolk Estates in Arundel.

Bramber village and castle

Adur Valley

Geology and Hydrology

In reality, the Adur comprises two separate streams which share a common estuary. The Western Adur rises in the parish of Slinfold and flows through Shipley and West Grinstead, whilst the Eastern Adur rises on Ditchling Common and flows north and west to pass between Haywards Heath and Burgess Hill. The estuaries of the two streams meet near Henfield and take a common course through Henfield Levels - an area of unspoiled wetlands particularly attractive to dragonflies, damselflies and over-wintering wetland birds. The tidal river, which is 18km long, passes through the South Downs via Shoreham Gap, a valley designated as an Area of Outstanding Natural Beauty.

The catchment area of the River Adur is approximately 500km^2, with the East Adur draining 167km^2, the West Adur 143km^2 and the tidal estuary 195km^2.

Average rainfall over the catchment is 833mm per year.

The Adur has a large number of small tributaries which rise mainly on the Wealden Clay. As a consequence they have little flow in dry weather, but rise rapidly after rainfall, in contrast to those tributaries such as Copyhold Gill and Cowfold Stream which rise from springs on the Tunbridge Wells Sand and have a reliable base flow. The southern tributaries are fed by prolific chalk springs flowing from the scarp face of the South Downs. In its journey to the sea, the tidal section of the river crosses first the Lower Greensand, in the Henfield area, then the Gault Clay and Upper Greensand, before flowing over alluvial deposits in its passage through the South Downs.

The Environment Agency measures river flow at gauging stations at Sakeham on the East Adur and Hatterell's Weir on the West Adur. The data these provide enables the Agency to manage water abstraction from the river by way of the statutory Abstraction Licensing system. However, the catchment is not heavily abstracted, most licenses being for agricultural purposes such as spray irrigation. There are six small groundwater sources for public water supply, but no water is taken for this purpose from the river or its tributaries.

Water Quality in the Eastern Adur

Good road and rail communications between London and Brighton have encouraged the development of commuter towns like Burgess Hill, Hassocks and Hurstpierpoint, resulting in a large concentration of population around the headwaters of this small river. Additionally, the clay catchment and lack of springs make this river very dependent on rainfall, so that in dry weather more than 87% of the flow in the upper reaches may be treated sewage effluent. From the 1960s to 1980s population growth in this area outstripped the provision of sewage treatment works, so that effluents were not always of sufficiently high quality to maintain the health of the river. However, a new sewage treatment works at Goddards Green, serving Burgess Hill, has resulted in greatly improved effluent and river water quality.

River Quality Objectives are set by the Agency, which also uses a statutory system of consents to control the quantity and composition of all effluents discharged to rivers. The Agency monitors river water quality and samples effluents throughout the year. Given the nature of the catchment and size of population, effluent conditions are rightly stringent.

Adur Valley - Beeding cement works and 1940 defensive pillbox

Water Quality in the Western Adur

Apart from a few small areas of mixed woodland, most of this catchment is agricultural land used mainly for livestock farming. The clay soil and profusion of land drains make the river constantly vulnerable to accidental spillages and pollution from farm wastes - particularly silage liquor and farmyard slurry.

Adur Valley at Botolphs

Agency Environment Protection Officers carry out a continual programme of inspections and visits to advise and encourage farmers to develop efficient waste management methods. A measure of their success is that for most of the time there is nothing to show for their hard work - people only notice when things go wrong!

Fisheries

Whilst the tributaries and upper reaches of the river support a population of small brown trout, bullheads and stone loach, it is the roach, dace and chub of the middle reaches which attract anglers. The upper tidal reaches, which are rarely affected by salt water, have a more diverse population of fish including bream and pike. In common with other Sussex rivers the Adur supports a good run of sea trout which migrate from the sea during the summer months. Their passage through the river takes them to the upper reaches where, in late December, they spawn on shallow gravel beds. Sussex sea trout generally grow to a healthy size and average 2.5kg. Illegal netting in the lower stretches of the river is an ongoing problem and requires firm enforcement to protect this important fish stock.

Angler at Coombes

Beeding

Recreation

The Agency has a duty to promote rivers and water space for recreational use, but must have regard to other environmental factors. In the non-tidal reaches there are few opportunities for water-based activities other than angling, but canoeists and other small-boat sailors enjoy the estuary, although it is subject to strong tidal currents. The main centre of activity is downstream of the toll bridge at Old Shoreham and in addition there is a public launching ramp for small craft at Beeding Bridge, which is the starting point for the annual Bath Tub Race to Shoreham.

Away from the river the catchment is criss-crossed by a network of public footpaths and bridleways, passing through an attractive landscape, appreciated by walkers, cyclists, riders and bird watchers. Historical interest centres on the churches at Old Shoreham, Botolphs and Coombes, which is noted for its mediaeval wall paintings.

Flora and Fauna

The Environment Agency has a duty to protect and enhance wildlife and habitats associated with the river, and works closely with English Nature and conservation bodies such as Sussex Wildlife Trust, the RSPB and local groups to achieve this aim. Where possible the Agency seeks collaborative projects and enhancements that aim to improve the quality and diversity of the catchment.

Important areas within the Adur catchment are:

- A wet willow woodland (carr) Local Nature Reserve (LNR) in the lower reaches.
- Adur estuary Site of Special Scientific Interest (SSSI), noted for its reptiles and winter wildfowl, and an RSPB Nature Reserve.
- Upper Beeding Site of Nature Conservation Importance (SNCI)
- River Adur Meadows SNCI , the site of two herb-rich meadows and ditch system on the lower eastern banks.

Widewater, Lancing

Flood Defence and Land Drainage

Whilst it is impossible to prevent the circumstances which cause floods, the Agency aims to help protect people and property from the effects of tidal and river flooding. It also provides a flood warning service - FLOODLINE 0845 988 1188 . To this end the Agency maintains some 39km of flood banks on the tidal section, from Shoreham to Bines Green (on the west branch) and Shermanbury (on the east branch). Equally important is the advice given to planning authorities to control development on land which may be liable to flood, or which may, indirectly, cause flooding elsewhere.

Flooding problems on the Adur are infrequent, although occasionally a combination of a high tide and high river flow may cause local overtopping of the river banks. Blockages of channels, bridges and culverts by rubbish and other obstructions is another cause of flooding, which can be prevented only by constant vigilance.

In winter there is a need to drain agricultural land to prevent waterlogging, and in summer high water levels are needed in rivers to prevent livestock straying and to provide water for irrigation. In the case of the River Adur, summer flow is a mere fraction of winter flow, but the two contrasting objectives are met by the operation of sluices and penstocks to control water levels. Boards are removed from these in winter, so that floodwater is not impeded, and replaced in spring to retain a head of water. Many small water control structures were built in the past to serve fisheries, or in connection with the Wealden iron industry, but of the modern structures the largest are Merrion's Penstock at the tidal limit of

the Western Adur and Chates Dam at the tidal limit of the Eastern Adur. There are also two float-operated tilting weirs at Twineham and Shipley, and a hydraulic lifting gate above Shermanbury.

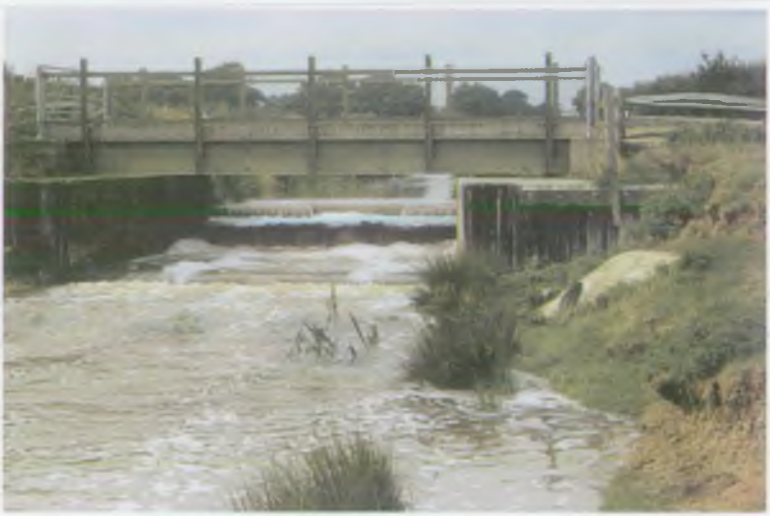
In the flood plain of the river there are four pumped drainage systems, which serve agricultural land at Applesham, Annington, Beeding Brooks and Northover.

Non-tidal watercourses are routinely maintained to remove obstructions and excessive weed growth to ensure that water can pass through the channel effectively at all times. On the main river and its tributaries there are more than fifty bridges ranging from the A27 roadbridge at Shoreham to farm accommodation bridges and footbridges. Each one is a potential site for blockage as debris gets caught up on the structure, leading to flooding when the river is full. These bridges, along with more than 200 other structures, are inspected regularly by the sluicekeeper. The penstocks and sluices have to be greased and checked to ensure that they will work when required.

The Environment Agency maintains not only the river and its banks, but also the foreshore from Brooklands, Worthing to Shoreham on the mouth of the River Adur and also Ferring Rife and foreshore. Re-profiling the shingle in winter provides protection against storms and repairing timber groynes helps to prevent tidal flooding.

River Adur tidal embankements at Beeding

River maintenance



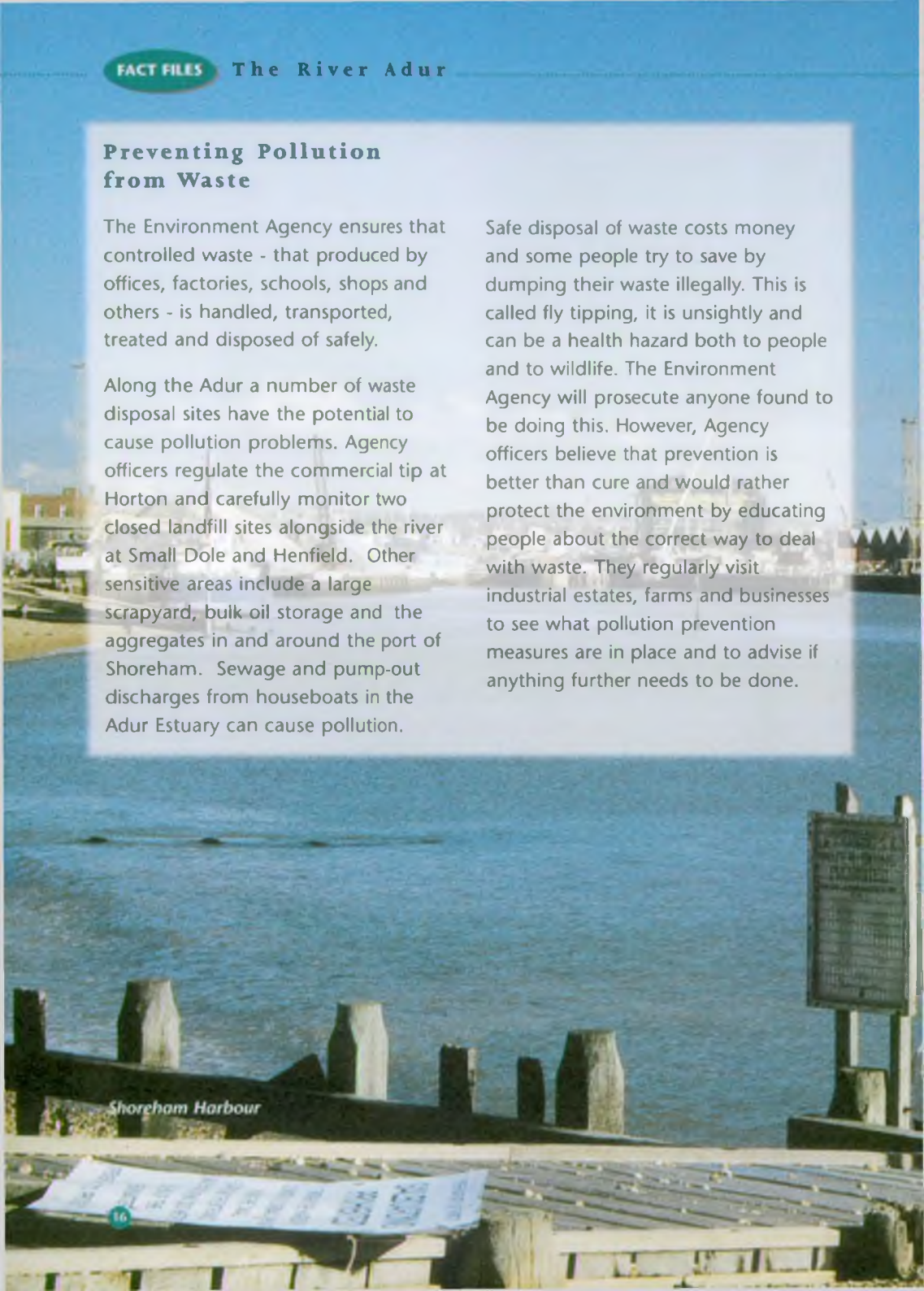
Knepp Sluice

Preventing Pollution from Waste

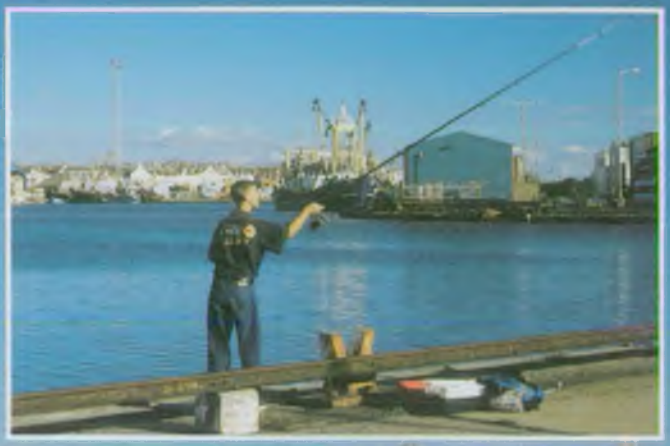
The Environment Agency ensures that controlled waste - that produced by offices, factories, schools, shops and others - is handled, transported, treated and disposed of safely.

Along the Adur a number of waste disposal sites have the potential to cause pollution problems. Agency officers regulate the commercial tip at Horton and carefully monitor two closed landfill sites alongside the river at Small Dole and Henfield. Other sensitive areas include a large scrapyard, bulk oil storage and the aggregates in and around the port of Shoreham. Sewage and pump-out discharges from houseboats in the Adur Estuary can cause pollution.

Safe disposal of waste costs money and some people try to save by dumping their waste illegally. This is called fly tipping, it is unsightly and can be a health hazard both to people and to wildlife. The Environment Agency will prosecute anyone found to be doing this. However, Agency officers believe that prevention is better than cure and would rather protect the environment by educating people about the correct way to deal with waste. They regularly visit industrial estates, farms and businesses to see what pollution prevention measures are in place and to advise if anything further needs to be done.



Shoreham Harbour



Glossary of Terms

Abstraction	When water is taken from a river or underground rock strata
Aquifer	A layer of permeable rock, deep under the surface, capable of absorbing and storing water
Alluvial	Fertile soil made up of mud, silt and sand left by flowing water
Dredging	Removing material from a river bed
Groundwater	Water which seeps through the ground into the permeable rocks many metres below the surface
Siltation	Deposits of sand and mud collect on the river bed, gradually filling it
Tributary	A small stream that joins the main river

Photography by John Chandler

EA - Southern

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