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## Water Pollution Incidents in England and Wales 1998



EA: Water Quality Box 5



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Top picture: Effects of soil erosion, Anglian Region

Bottom picture: Impact of discharge of china clay on the  
River Fal, Tregony Bridge, Cornwall, South West Region.

ENVIRONMENT AGENCY



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*EA - Water Quality*

# **Water Pollution Incidents in England and Wales 1998**

**Report of the Environment Agency**

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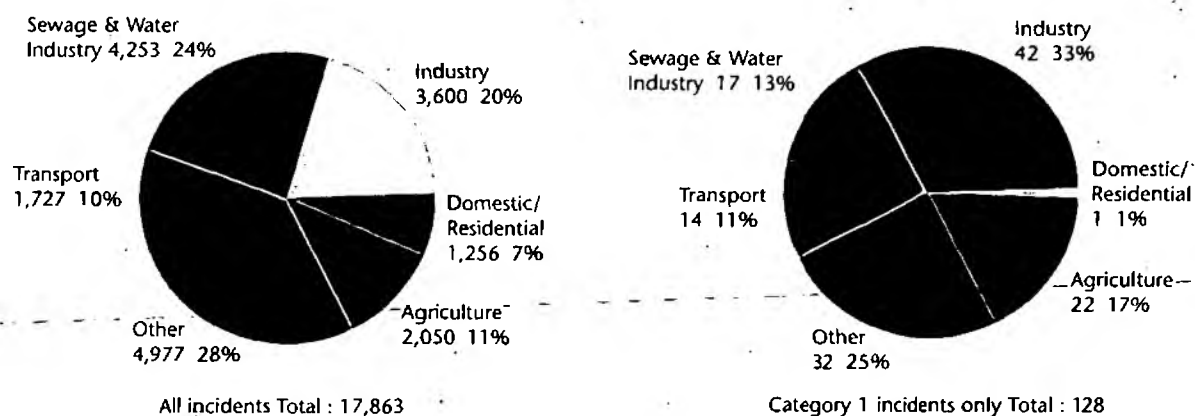
## Executive Summary

The Environment Agency responded to 28,670 reports of water pollution in 1998, of which 17,863 were substantiated on investigation. These figures show a decrease of 7%, compared with 1997, in the number of reports and 9% in the number of substantiated incidents. Following a sharp rise in the number of the most harmful, Category 1 (Major) incidents in 1997, the downward trend has continued, with the total now standing at 128, the lowest since records began.

There has been a fall in the number of substantiated incidents for the fourth successive year, with only the North West Region reporting a slight increase. There were significant decreases in North East Region (-17%) and Environment Agency Wales (-16%). The continued fall in substantiated incidents is welcome, particularly as it is reflected in all categories. A number of factors may have influenced the figures. For example, heavy and prolonged rainfall affecting much of the country may have resulted in fewer incidents being reported due to greater flows in the rivers, but also in an increase in the number of organic pollution incidents as farmers encounter problems with the storage of increased volumes of slurry and difficulties with disposal where the ground is waterlogged. The data in this report supports this. An increase in the number of sewage discharges might also be expected, but there has been a marked decrease of 19% in these incidents. This may, in part, reflect the significant investment in sewerage systems and sewage treatment in recent years.

Pollution incidents are categorised by source and type of pollution. By source, the sewage and water industry accounted for the largest proportion (24%) of incidents (see Figure A below). Once again (for the sixth consecutive year) the construction industry was the most frequently identified source of industrial pollution, with an overall increase of 6% in addition to a 15% increase in the previous year. Dairy farming was the largest source of agricultural pollution with beef cattle farming replacing sheep farming as the second largest source, following a 150% increase in a year. Pollution from domestic and residential sources accounted for 7% of all incidents.

Figure A Distribution of substantiated pollution incidents by source, 1998

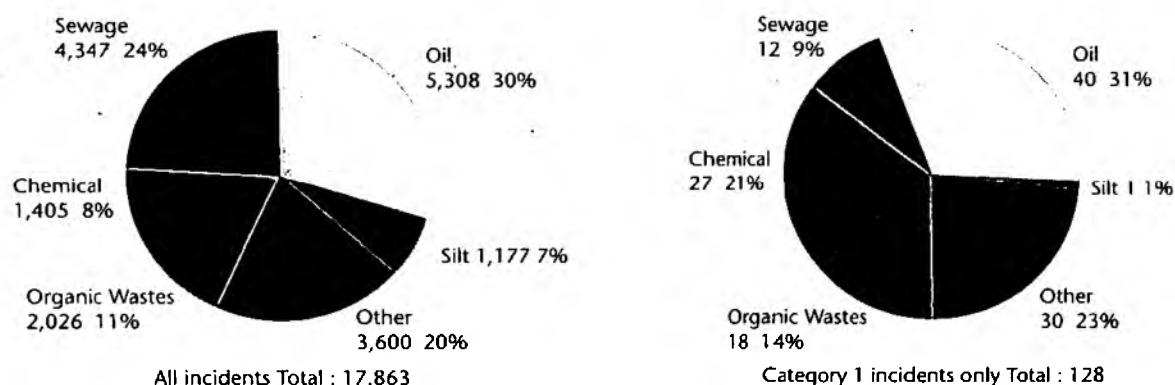


By type of pollutant, sewage as a percentage has fallen significantly (from 28% in 1997 to 24%). As a consequence, for the first time, oils and fuels are the most significant type of pollutant, accounting for 30% (see Figure B below). The number of major incidents involving fuels and oil has also fallen, but is still significantly higher than in 1996. Both these factors indicate the limited impact of voluntary measures in reducing oil pollution, highlighting the need for the Government's proposed regulations to control oil storage. Inert suspended solids accounted for 7% of the total.

Cattle slurry was the most frequently identified organic waste and paints and dyes the most commonly recorded chemical pollutant. Diesel was the most commonly identified oil, but identifying oil which has been in a stream or drainage system for some time is difficult and the oil type could not be established in 19% of incidents.

Prosecutions were brought for 90 incidents of water pollution that occurred in 1998 and a further 187 relating to incidents in 1997. A total of 262 polluters were successfully prosecuted. At 1 January 1999 a further 95 cases relating to incidents in 1998 had yet to go before the courts. On 15 January 1999 a fine of £4 million, the highest ever in relation to a water pollution offence, was imposed on the Milford Haven Port Authority following the *Sea Empress* incident in February 1996. \*

Figure B Distribution of substantiated pollution incidents by type 1998



\* An appeal against this sentence is pending

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# 1. Introduction

## 1.1 Background

This report covers the calendar year 1998 and records water pollution incidents occurring in England and Wales. It also includes details of court cases heard in 1998 and of the *Sea Empress* case which was heard in January 1999. Details of some of the other, more serious incidents from previous years, which could not be reported earlier because they had not come to court when the 1997 report was published, are included. The format and data presentation used in earlier reports have been retained for comparison.

## 1.2 Definitions

During 1998, the Agency used a standard pollution incident classification based on that introduced in January 1995. Appendix A gives details of the scheme. For the purpose of this report, incidents are reported on a river catchment basis. In the case of Environment Agency Wales this differs from the political boundary. Therefore all references to incidents in the Environment Agency Wales in this report are on a catchment basis.

## 1.3 Current and future developments

The system of classification for all incidents used by the Environment Agency has been reviewed to take into account the Agency's full range of activities. As a result a common incident classification system (CICS) which separates environmental impact from a measure of the impact on the Agency's resource has been used by the Agency from 1 January 1999. Using this system, an incident requiring major action by the Agency which resulted in containment of the pollutant,

would be recorded as having a low environmental impact, but a high impact on Agency resources. Under the previous scheme, which was used to compile the data in this report, such an incident would be recorded as a Category 1 (Major) incident on the basis of the potential for pollution and the resources needed to contain it.

New regulatory powers strengthening the Agency's pollution prevention role came into force on the 31 January 1996. These introduced Enforcement Notices, which can be served on a discharger who holds an Agency discharge consent if that consent is contravened or is likely to be. In most cases a satisfactory conclusion is reached without recourse to a formal procedure. However, where there is no evidence that a voluntary approach will resolve a problem, a notice is issued. The number of notices issued in 1998 was small.

The Department of Environment, Transport and the Regions has consulted on further regulatory powers including anti-pollution works notices, groundwater protection regulations, oil storage regulations and Building Regulations covering the installation of heating oil storage tanks for single dwellings. Transitional arrangements for the Groundwater Regulations came into effect on 1 January 1999, with the full provisions in force from 1 April 1999, and anti-pollution works notice powers come into force on the 29 April 1999. The proposed regulations on oil storage, which would ensure that all newly installed oil storage tanks on industrial, commercial and institutional premises are of an adequate standard and properly bunded, and the Building Regulations are expected to be implemented in 1999/2000. The need for these regulations is emphasised by the slow progress in reducing pollution involving oil, compared with other types of pollution.



## 2. Pollution incident management

This section includes examples of the type of pollution incidents dealt with. These demonstrate the actions needed to investigate a pollution incident and to control its impact. On average 79 pollution incidents were reported each day in 1998 and although the majority were minor, they all required investigation. In some cases the source of pollution was easy to identify, but there were many cases where the pollution only occurred under certain conditions, or it had to be traced through surface water sewers. In these cases lengthy investigations were often required.

### 2.1 Major incidents

There were 128 major and 1238 significant incidents in England and Wales in 1998. In all cases Agency Environmental Protection staff assessed the incident and, where appropriate, endeavoured to arrive on site within published target times of two hours during office hours and four hours at other times. Once the pollution was confirmed, Agency officers acted to minimise the impact of the pollution, warn those who may be affected such as downstream water users, trace the source and collect evidence for any resulting legal action. Photographs showing some of these incidents are on pages 21 to 24.

#### 2.1.1 Agricultural

##### *Sheep dip - North West Region*

Pollution caused by sheep dip has continued to have a significant impact in areas where it is commonly used. Because the chemicals in sheep dip do not directly affect fish, but kill the invertebrates fish may feed on, spillages are not immediately apparent. In addition, because it is so effective at killing these creatures, very small quantities can have a devastating impact. A number of reports relating to the north area of North West Region, covering the Lake District and the Pennines, indicate that the fauna in streams has been badly affected. In some cases it is not possible to identify a single source, and pollution prevention visits to the farms in the catchment are programmed in an effort to prevent further damage.

In one example, a student studying invertebrate life in the upper Lowther catchment found the main river severely depleted of insect life, although the tributaries were healthy. A biological survey was undertaken on 27 January 1998, confirming the impoverished invertebrate population and tracing the source to a small tributary. About 7km of the River Lowther, which is designated as part of the River Eden and tributaries Site of Special Scientific Interest (SSSI), were affected. Further sampling of the tributary showed it to be healthy above Green Farm but severely impacted downstream. A sheep dipping tub was found at the farm at the top of a steep bank close to the stream. The operator's well, adjacent to the tub, drained directly to the stream, and the biological survey provided evidence consistent with the input of a synthetic pyrethroid-based sheep dip at the discharge point. The farmer

later admitted that the dip had been used in November, but had not been emptied until December. As a result, rainwater would have caused it to overflow.

This incident demonstrates the potential for environmental damage if sheep dip is not properly used and disposed of. The River Eden SSSI is designated for its Atlantic salmon and crayfish populations. Crayfish and the invertebrates which are the food of the salmon are particularly vulnerable to sheep dip.

##### *Slurry lagoon collapse - North West Region*

Following a request from the local police and the fire service at 12.05 on 8 May 1998, an Environmental Protection Officer arrived at Temon Farm, Brampton in Cumbria at 12.40. He found that the A69 was covered in up to 150mm of farm slurry. This was discharging to the nearby Poltross Beck via the road drains. The officer immediately organised remedial work to minimise the impact of the discharge. Road drains were blocked and arrangements made for the safe removal of the slurry from the roads and drainage system. Further investigation showed that much of the slurry had entered the beck directly from the farm down a steep bank following the collapse of a retaining wall forming part of a slurry lagoon. Arrangements were made for the farmer to prevent any further slurry entering the beck and an inspection was made to determine the extent of the pollution. In order to protect the downstream River Irthing, the beck was dammed at an accessible point with the help of the County Council. The Fire Service then used pumping equipment to pump the contaminated water onto a nearby field (with the permission of the landowner) until the Agency's own Emergency Works Unit could take over. Agency staff also aerated the beck. Pumping continued until 15.00 the next day, when the dam was removed.

In this case, prompt action, with the co-operation of a number of parties, was effective in protecting the lower reaches of the beck and the River Irthing.

##### *Soil erosion - Anglian Region*

Soil erosion continues to have a serious impact on rivers and agricultural land. Particular problems can occur where outdoor reared pigs are kept in inappropriate fields, which slope steeply, or where pig numbers are too high. Outdoor reared pigs cause the green cover in a field to be lost, resulting in an increased rate of topsoil erosion. The use of buffer strips around fields, to which the pigs do not have access, can help prevent soil erosion. Following a report from a member of the public on 5 October 1998, an Environmental Protection Officer from Norwich investigated an incident where, following heavy rain, large quantities of soil had been eroded from some large, sloping fields without buffer strips used for outdoor reared pigs. The soil had been washed down the hill, over a village crossroads and into a river at a millpond. The extent of the erosion can be seen in the photograph on page 24. As a result

of Agency intervention, the farmer moved the pigs and cultivated the fields affected to stabilise the soil.

### 2.1.3 Industrial

#### *Food processing - North West Region*

A number of prosecutions involving discharges from food processing companies occurred in 1998. Wastes and effluents from the food industry can be highly polluting if not properly managed. Many related to cases on 1997, but the following case from 1998 demonstrates some of the problems common to the sector, including a lack of awareness concerning drainage systems.

On 27 April a report from a member of the public using the Agency's Emergency Hotline resulted in a local Environmental Protection Officer inspecting the Priest Gill, a tributary of the River Keekle in Whitehaven. A concrete pipe serving as a surface water drain for the premises of Euromak Ltd, a fish processing company, was found to be polluted with fish wastes, causing foaming and fungal growth. The drain should have carried only surface water, but on inspection the officer reported that "the yard was awash with debris which included dirty water and fish waste". The site manager believed that the effluent passed into a foul sewer. However, a dye test soon proved that the yard was connected directly to the stream. Matters were just as bad the following day, but had improved by 1 May. Previous owners of the site had twice been written to requesting that the situation be improved. In this case the company was prosecuted and the evidence was presented to Whitehaven Magistrates, where the company pleaded guilty and was fined £7,000.

#### *Quarry operation - South West Region*

On 14 January 1998 staff at ECC International Ltd alerted the Agency to a problem in one of their operations near St. Austell in Cornwall. A report of pollution was also received from a member of the public. When inspected, the Burngullow Leat, a tributary of the River Gwindra leading to the Fal, was white and thick with china clay, with the banks of the watercourse also coated. A similar effect was apparent on the River Fal 15km downstream.

A china clay pipeline had burst, and it was estimated that 275,000 litres were lost over two hours. Tankers were used to pump the liquid clay from the leat and a sump was dug to contain the clay and prevent further pollution. The incident demonstrates the damage that can occur when systems fail. It is vital that companies in control of potentially polluting materials maintain their facilities, that systems are fail-safe and that contingency plans are in place. The company was fined £1,600 when the case came to court in November 1998.

#### *Wrongly connected trade effluent - Thames Region*

The keeping of an up-to-date record of the site drainage system, training of staff in its operation and regular inspections and maintenance are all essential on industrial sites. If this is not done, pollution may occur that is difficult to trace due to changes to drainage systems over time.

An Agency Conservation Officer noticed that the Goddards Stream in Thatcham, Berkshire, was milky white on 21 May 1997. An Environmental Protection Officer was on site within an hour and traced the discolouration to a surface water sewer serving the premises of SCA Packaging, a cardboard manufacturer. Investigations showed the presence of a blue/white fluid in the drainage system. An old site plan was located but proved to be of little value due to the many changes that had occurred on the site. Efforts to trace the source of the discolouration were hampered by the poor condition of the drains and by the difficulty of lifting the heavy manhole covers, which had not been maintained. Company staff used a forklift truck to open some, but others had to be broken open with a sledge hammer. A drain cleaning company was called in to remove the polluted effluent from the drains, removing over 9,000 litres of contaminated water. Dye testing of the drains confirmed that a starch effluent pump had been connected to a roof-water downpipe gully.

The Goddards Stream was badly affected with sewage fungus, indicating that the discharge had been occurring for some time. The company were aware that their drainage system was unsatisfactory and had already started remedial works. However, it is evident that adequate measures to prevent pollution occurring were not in place.

The case was heard at West Berkshire Magistrates Court on 14 September 1998, when the company were fined £12,000 and ordered to pay the Agency's legal costs of £976.

#### *Surface water discharges from construction site - Midlands Region*

On 6 January 1998 Environmental Protection Officers inspecting the Walsall Canal at Wednesbury saw that it was discoloured. About a kilometre of the canal was coloured red with what proved to be clay particles. This discolouration was traced back to a construction site where Fitzpatrick Construction Ltd and Parkstone Construction Ltd were operating.

A bund had been built around the site to prevent surface water run-off, but this had been breached at one point. This was allowing water contaminated with the clay to run into the canal. On a different part of the site, a pump was found to be discharging water contaminated with clay into an inadequate settlement tank, with an overflow of polluted water into a highway drain discharging to the Lea Brook.

The Agency has been working closely with the construction industry to highlight the pollution risks from construction sites, the need to understand where drains discharge and the techniques for preventing pollution. Such incidents still occur, however, and in this case both companies were prosecuted and each fined £2,500.

### 2.1.4 Sewage treatment and water

By the nature of their operations, sewage treatment works have the potential to cause serious pollution. The level of automation and reliance on remote alarm systems has increased

in recent years. The consequences of the failure of these systems can, however, be serious.

### *Untreated sewage discharge at treatment works - South West Region*

A pollution incident on 3 June 1997 came to court in April 1998. During routine sampling very low dissolved oxygen levels and dead and distressed fish were found in the River Biss below Trowbridge sewage treatment works. An inspection of the river further downstream found a plug of foamy, milky grey water slowly moving down the river. Agency staff acted to protect fish in the lower reaches of the river using aerators and hydrogen peroxide to raise oxygen levels. The operation continued overnight and into the next day. Over 5,000 dead fish, including roach, chub, dace, bream and pike were recorded.

The pollution was traced to Trowbridge sewage treatment works where major refurbishment and upgrading work was being undertaken. Flows through the works are pumped from the inlet by a set of seven pumps. All these pumps appeared to have shut down, resulting in an overflow of crude sewage entering the watercourse. A high-level alarm was triggered, but was ignored. Wessex Water, the plant operator, was fined £15,000.

### *Discharge of sewage from a pumping station - Thames Region*

An incident on 16 November 1997 came to court on 23 September 1998 where Thames Water were fined £6,000 and ordered to pay the Agency's legal costs of £700. A member of the public alerted the Agency to a discharge of sewage into the Shonks Brook at Hastingwood, Essex. On inspection, sewage was found to be reaching the stream by two routes, via an overflow pipe and a manhole cover. This was found to be due to a power failure and blocked sewer at the adjacent Wynters Brook sewage pumping station. Further investigation showed that half a kilometre of stream was affected with sewage fungus, indicating that the discharge had occurred for several days. The station record indicated that the pumps had been switched off for maintenance on 13 November but not switched on again. This incident highlights the importance of proper systems of work, which could have prevented pollution from occurring.

## **2.1.5 Transport**

### *Blood spill, M6 - Midlands Region*

On 23 September the driver of a tanker loaded with animal blood noticed that he was losing his load on the elevated section of the M6 in Birmingham. A significant quantity had been spread along the carriageway. Agency officers and the fire service attended the incident. Equipment in the Fire Service Pollution "Pod", provided by the Agency, was used to seal the drainage system and contain the spillage on the road. Agency staff had previously identified that a spillage or accident on this section of road posed a high risk to local watercourses and had carried out a survey to trace the drains and identify where they discharged. Using this information, the appropriate outfall was

blocked off and the effluent accumulating behind the drain blocker was removed by tanker. Once the load had been transferred to a different tanker, the road surface and drainage system were cleaned. The blocked drain was used to collect the effluent, which was removed. As a result of the close co-operation between the Agency and the Fire Service and the Agency's earlier efforts in tracing the drainage system, pollution of the local watercourse was avoided.

### *Tanker accident - South West Region*

Prosecution of a company for pollution following a traffic accident is rare. Where the circumstances indicate that the accident could have been avoided, however, the Agency will prosecute.

Following a report of a traffic accident involving a fuel tanker at Coles Mill Bridge, near Holsworthy, north Devon, an Agency officer attended the scene. The tanker was on its side in a pool of escaping oil. Despite efforts to block surrounding drains, some of the oil reached the Coles Mill. Approximately 5,000 litres of fuel were spilt. The driver said that as he came down a hill towards the bridge, he realised that the vehicle's brakes were not working properly and the vehicle had turned over as he attempted to avoid other traffic.

It is vital that vehicles are checked regularly, especially where fuel or other potentially polluting materials are being transported, in order to prevent serious accidents. In this case the company was prosecuted and fined £1,000.

## **2.1.6 Other incidents**

### *Natural causes - Thames Region*

Early on 4 March 1998 the Agency's 24-hour communications centre in Reading received a call from Berkshire Trout Farm at Hungerford reporting tens of thousands of dead and dying fish. An Agency officer investigated and confirmed the serious nature of the incident. By dawn it was clear that the incident had originated in the Kennet and Avon Canal near Froxfield, with the natural fish populations in a 4km stretch of the canal and part of the River Dun also affected. No other wildlife was affected and no fish were dying downstream of the fish farm.

Chemical analysis of the water failed to identify any obvious cause, with normal readings for dissolved oxygen and other pollution indicators. Examination of the fish showed severe gill damage, indicating that the fish had suffocated. Agency staff searched the area to define the extent of the damage and checked farms and industrial premises for evidence of any discharge which may have caused the incident. Fire Service records were checked for incidents, the police assisted with an aerial survey and British Waterways were advised to close the affected section of the canal as a precaution. A large number of samples were taken and, in addition to the Agency's own laboratories, specialists from the Water Research Centre, Home Office Forensic Science Service and leading universities were called in.

A major operation was mounted to remove the dead fish, with 150 tonnes being removed and disposed of over a five-week

period. Laboratory tests ruled out man-made chemicals, including pesticides, metals and detergents, and attention focused on natural sources. Fish continued to die in the canal for several weeks, with surges in toxicity which would not be expected had a pollutant entered the watercourse. The evidence pointed towards a toxin produced by bacteria living in the water. Laboratory trials indicated that hydrogen peroxide was effective in breaking down the toxin and, on 28 March, Agency staff successfully treated the affected parts of the canal with controlled levels of hydrogen peroxide. The canal was then considered safe and was re-opened on 3 April.

It is believed that unusual conditions in the canal caused bacteria to produce levels of toxin that triggered a natural defence response in the fish, causing the growth of excessive tissue in their gills and consequently suffocation. Studies into the incident and ways to prevent a recurrence are continuing.

#### *Sheep dip pollution from hunt kennels - South West Region*

Concerned local residents raised the alarm on 16 April 1998 when they spotted dead and dying crayfish and other invertebrates in the Sherston Avon and Luckington Brook at Pinkney, near Malmesbury, Wiltshire. Agency officers established that thousands of crayfish had been killed in a 7.5km length of the watercourse. The Agency's laboratories identified an insecticide, cypermethrin, which is used in crop spraying and sheep dip, as the cause.

No agricultural sources could be found, but eventually the damage was traced to Badminton sewage treatment works. Further investigations traced the insecticide through the sewerage system and eventually the premises of the Beaufort Hunt Kennels were identified. A sheep dip called Crovect, containing cypermethrin, had been used to treat hounds for mange, and had then been washed off the hounds, entering the river via the sewerage system and sewage treatment works.

This incident involved a considerable effort by the Agency in tracing the source and establishing the extent of the damage. The watercourses affected were recognised as of national significance for the population of the native white clawed crayfish, but monitoring has shown that only a remnant of this population has survived. It is anticipated that it will be many years before numbers recover, due to their slow rate of reproduction. The case came to court in October 1998, when the hunt master was fined £6,000.

## 3 Pollution prevention

### 3.1 Sheep dip

In the conclusions and recommendations section of the 1996 and 1997 reports, the Agency's concern over pollution from sheep dip chemicals was highlighted, in particular the impact of synthetic pyrethroid (SP) dip. This has largely replaced organophosphorus (OP) formulations in recent years. All sheep dip formulations are environmentally toxic, but SP formulations are about 100 times more toxic to aquatic insects. The practice of disposing of used dip solution into soakaways has been of particular concern for a number of years and will now be controlled under the Groundwater Protection Regulations which come into effect on 1 April 1999. The Agency has already made a major effort to educate and inform sheep dip users of the hazards and the new legislation so that all farmers who need an authorisation for the continued disposal of used sheep dip on farms had submitted an Application before the April deadline.

The Agency's pollution prevention guidance on sheep dip (PPG12) has been reprinted, with changes which take into account the impact of the new Regulations. It will be distributed to farmers making applications for authorisations for disposal of sheep dip.

Part of the initiative to deal with pollution from sheep dip includes the publication of a "Sheep Dip Strategy" (R&D Technical Report P237). This looks at ways forward that are sustainable for both the environment and sheep farming. It was published following consultation with a wide range of interested organisations.

### 3.2 The construction industry

Efforts to reduce the number of pollution incidents involving the construction industry have continued. A range of initiatives have been tried to reverse the rise in the number of incidents involving the industry. Some of these follow earlier efforts, such as the joint Agency/Construction Industry Research and Information Association (CIRIA) training video, "Building a cleaner future". In addition, Agency staff have worked with individual companies, providing advice and training at site and company level. The Agency has also attended construction industry exhibitions and participated in a number of collaborative projects with industry bodies, resulting in an improved range of environmental guidance for the industry. As well as a revised version of the Agencies' Pollution Prevention Guidance on construction and demolition sites (PPG6), published in November 1998, the Agency has assisted with a number of CIRIA reports. These include an environmental site guide, published early in 1999, three waste minimisation and recycling documents - a boardroom hand book, design manual and site guide and the revision of CIRIA's Environmental Handbooks. Work on a new guide for the management of water on construction sites started in 1998.

The benefits of working with the construction industry to minimise the risk of harm to the environment are illustrated by an incident in Dorset. A major road construction project in the county, replacing an 8km section of the A35, passed through a source protection zone and crossed two salmonid rivers. The project was scheduled to start in 1996 and to take three years. The benefits of working with the contractors, BBTA, a consortium of Balfour Beatty, Tilbury Douglas and Deutsche Asphalte, were recognised and an Agency "Account Manager" was appointed. Agency officers assisted in training the workforce to raise awareness of the risks to the environment and how environmental impacts could be minimised. Over 200 site visits, meetings and discussions were held, with consultation on design and construction issues, river diversions, waste disposal, fuel handling and pollution prevention. As a result, the company maintained a stock of pollution prevention materials on site, including oil adsorbent materials. Good practice on the site ensured that very few incidents occurred, and those that did were promptly and effectively dealt with. Soon after the opening of a section of the new road, however, a road traffic accident on the old road resulted in a fuel tanker overturning into the River Piddle. BBTA's site staff responded immediately, bring heavy plant to haul the leaking tanker upright and using their spill control equipment to deal with the oil. The prompt action of the construction company staff averted a serious pollution and saved a substantial length of river from damage.

### 3.3 Other initiatives

#### 3.3.1 Oil pollution

Oil pollution continues to be a significant problem. The Agency has continued to work in partnership with the petroleum industry, through the Oil and Water Steering Group, chaired by the Institute of Petroleum, to reduce the number and severity of these incidents. Efforts have been made, through the Oil Care Campaign, launched in January 1995, to adopt a voluntary approach. There has been little improvement over the last three years, however, although there was an initial sharp fall in the number of incidents. There is now significant support within the group for the introduction of regulations to set minimum standards for oil storage.

A research project to investigate prefabricated bunded tank systems has now started. Sales of prefabricated oil storage systems have been rising and conventional standards may not always be appropriate. This project brings together tank manufacturers, regulators and delivery companies to identify best practice and ways of improving standards.

In an effort to improve public understanding of the problems caused by oil pollution and of the part individuals can play in improving the situation, staff from the South Wessex Area of the Agency's South West Region attended the Dorset Steam Fair in Blandford in September 1998. The Oil Care Campaign was the theme of the Agency's stand, with examples of good and

bad oil storage practice, information on used oil disposal and demonstrations of how oil spills are dealt with (see photograph, page 23). Over 11,000 people visited the stand during the show.

### 3.3.2 Oil separators

A UK oil separator manufacturers' initiative involving a programme of testing separators to provide a standard performance measure was due for completion by the end of 1998. Unfortunately, the testing programme has been delayed, and will not now be complete until January 2000. A number of minor improvements in separator specification have also been adopted. The Agency's Pollution Prevention Guidance Note on oil separators (PPG3) has been revised and reprinted, taking this work into account.

### 3.3.3 Agricultural

The MAFF Codes of Good Agricultural Practice for the protection of water, soil, and air were revised during 1998. The Agency had a significant input, and was successful in getting improvements to a number of advice areas, and greater recognition of issues such as soil erosion and phosphorus control.

The Agency is in the process of piloting a series of Best Management Practices for agriculture, building upon the general advice given in documents such as the MAFF codes. They are targeted at the farming community and aim to be user friendly, focusing on the benefits to both the farmer and the environment.

This last year has also seen the introduction of two new pieces of regulation:

An action programme has been introduced in nitrate vulnerable zone areas, which aims to abate nitrate pollution of surface and groundwater impacted by agriculture. The measures limit the application rates of organic manures, and the timing of applications of manufactured fertilisers and certain organic manures. Farmers are also required to keep detailed records of fertiliser application and use.

Groundwater Regulations have now been implemented, and though they seek to control the release of dangerous substances from a wide range of activities, their initial impact is on agriculture. Authorisations are now required for land disposal activities of materials such as pesticide washings and sheep dip. More importantly, they provide notice powers to enable pollution prevention.

### 3.3.4 Sustainable urban drainage

In many urban areas the impact of surface water drainage on water quality is becoming more apparent as investment in the sewerage system reduces the frequency and volume of untreated sewage discharged. Conventional surface water drainage systems have evolved with one main objective: to remove rainwater as rapidly as possible from impermeable surfaces such as roofs, car parks and roads. This causes a number of problems, however, including poor water quality,

impoverished flora and fauna, increased flooding risk and reduced recharge to underground aquifers.

Sustainable Urban Drainage Systems (SUDS) offer a range of alternative techniques to reduce or eliminate these adverse effects. The techniques, which have been widely used abroad and which are now gaining acceptance in the UK, include porous paving in car parks, soakaways for roof water (where ground conditions are suitable) and various wetland and pond systems.

A CIRIA project, which draws together a wide range of experts and interested parties, has been working to produce suitable technical guidance and to identify the barriers to the widespread use of SUDS. A technical handbook for Scotland and Northern Ireland is due for publication by September 1999, and one for England and Wales soon afterwards. The Agency has taken an active part in this project, working closely with the Scottish Environment Protection Agency which has pioneered these techniques in Scotland.

There are still a number of barriers to the acceptance and implementation of these techniques. As their use becomes more widespread, however, they will make a major contribution to maintaining and improving the quality of urban rivers and increasing their value for wildlife and amenity.

### 3.3.5 Liaison with fire services

The Agency's excellent working relationship with the Fire Service continues. The benefits to the environment, the Agency and the Fire Services are clearly highlighted by a number of major incidents, especially road accidents, where impact on the environment was significantly reduced or even prevented. Agency staff have continued to assist the National Fire College in developing training courses and through direct involvement in lectures and exercises.

An important development has been the formation of the UK Fire Forum, comprising representatives of the three UK environmental agencies, the Chief and Assistant Chief Fire Officers Association (CACFOA) and the Local Government Association. The group will look at areas of mutual interest, oversee the development of the Memorandum of Understanding between the organisations and put forward ideas for research in areas of mutual interest. One such project already identified and running will study the management of major fires and the possibility of allowing them to burn out in a controlled way in order to minimise the risk to the environment.

### 3.3.6 Publications

Many pollution prevention initiatives and publications are undertaken jointly by the Agency, the Scottish Environment Protection Agency (SEPA) and the Northern Ireland Environment and Heritage Service. Work on revising the series of pollution prevention guidance notes published by the Agencies progressed throughout 1998 and consultation on the last one, dealing with measures for the control of fire water

(PPG18), was completed in March 1999. A number of new titles are in preparation, including guidance on drum storage.

A code of practice for the timber treatment industry, published in March 1998, was produced jointly by the British Wood-Preserving and Damp-Proofing Association, the three UK environment agencies and the Health and Safety Executive. A new guide on the installation and management of oil recovery banks was launched in April 1998 as part of the Oil Care Campaign at a meeting of the National Household Hazardous Waste Forum in Bromley. Agency leaflets on avoiding pollution from homes and from industrial chemicals have been republished jointly with SEPA, and a leaflet on nitrate vulnerable zones has been produced. A full list of pollution prevention publications, along with details of how they may be obtained, appears in Appendix C.

### 3.3.7 Internet

In an effort to improve access to Agency information, the pollution prevention guidance notes are now available on the Agency's websites, [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk), with bilingual Welsh/English versions on [www.environment-agency.wales.gov.uk](http://www.environment-agency.wales.gov.uk).

### 3.3.8 Groundwater regulations

Consultation on new regulations for the protection of groundwater from pollution was undertaken in 1998. Transitional arrangements for the new regulations came into effect on 1 January 1999, with the full provisions in force from April 1999. These regulations implement the EC Directive on the Protection of Groundwater in England and Wales, and require prior authorisation for any activity that could result in the pollution of groundwater with Black or Grey List substances. A number of previously unregulated activities now require "authorisation" from the Agency including the disposal of spent sheep dip onto or into land.

The regulations also introduce the concept of "approved codes of practice" for activities with the potential for groundwater pollution. Provided that there is no intentional discharge of Black or Grey List substances, activities carried out in accordance with the codes of practice will not require consent. Work on the codes of practice, which will require Ministerial approval, is being carried out by DETR.

A long-term project to publish a full set of 53 groundwater vulnerability maps covering the whole of England and Wales was finally completed in 1998. These supplement the Agency's "Policy and practice for the protection of groundwater" document, and all are available from the Stationary Office.

### 3.3.9 Pollution prevention initiatives within the Agency

The Agency has an ongoing programme to identify environmental risks from its own sites and to take steps to minimise those risks. The Agency is investigating the possibility of implementing environmental management systems at its sites, with four sites, including its head office in Bristol, aiming to achieve certification to the international

standard ISO 14001 by the millennium. Preparatory work at 20 more sites began in April 1999, and further sites will be included over the next two years.

A major revision of the Agency's Pollution Prevention Manual is in progress to make it more useful to field staff. The manual provides a wide range of background material on managing pollution incidents and undertaking pollution prevention work, as well as detailed pollution prevention guidance for external use.

### 3.3.10 Working with water companies

The Northumbria Area of North East Region has undertaken a £100,000 partnership project with Northumbrian Water Ltd to assess the risk to public drinking water supplies on the Rivers Tees, Wear, Tyne and Coquet.

The joint-funded project has involved visiting all significant commercial, industrial and agricultural businesses that drain, or have the potential to drain, into drinking water catchments. The information gathered during the visits is used to establish the risk posed by the business, and advice has been given on how to reduce the risk.

Follow-up visits are scheduled for 1999 and will include surveying those businesses which may impact on drinking water supplies as a result of the failure of computer equipment on 1 January 2000, the "Year 2000" bug.

Northumbrian Water are delighted with the project output so far, including the production of chemical inventories which can now be used to identify high-risk businesses that may cause problems as a result of the Year 2000 bug.

### 3.3.11 Breweries

Following a number of pollution incidents at a major brewery, pollution prevention staff in the Thames Region's West Area undertook a pollution prevention initiative with brewery staff. Together they identified how pollution could occur, and developed guidelines on how it could be prevented. This was then tested in pollution prevention inspections at a further 14 breweries in the area. Recommendations for improvements were made for the individual sites, reducing both the risk of pollution and prosecution, and the experience gathered used to improve the guidance, which will be incorporated in the Agency's Pollution Prevention Manual.

## 4 Analysis of incidents

### 4.1 Introduction

In most cases, pollution incident investigations are the result of a report from a member of the public. An increasing number of calls are received from the fire services, notifying the Agency of incidents such as major fires and road traffic accidents that may require advice and assistance from Agency staff. Because of this, the types of pollution reported are predominantly those with the greatest visual impact, such as oil, silt and dyes. If a pollutant is not visible, if no fish are killed, or if pollution occurs regularly, it is unlikely to be reported. For example, pollution from sheep dip is often only identified as a result of biological surveys, because it cannot be seen and does not kill fish.

A person seeing pollution needs to know who to contact. Although a great deal of effort has been made to simplify and publicise the mechanism for reporting pollution, it is inevitable that some people will not know what to do if they see pollution and will not report it. As a result, the extent of episodic pollution in England and Wales is probably underestimated in this report. The number of incidents reported by the public grew with the introduction of the Emergency Hotline number (0800 80 70 60) in 1993, but the number of reports has now fallen for three successive years.

The assessment of the severity of an incident is not always straightforward, due to the great diversity in polluting materials and the nature of pollution incidents. Delays in incident reporting by the public, or finding that the polluting discharge has stopped before the arrival of Agency staff, may make incident substantiation very difficult or impossible. It is important that the public reports incidents as quickly as possible to enable the Agency to stop the pollution and catch the polluter.

Although this report contains details of the types and sources of pollution, it does not evaluate the causes of pollution. In many cases it is not possible to trace the source or identify the cause. Where such information is available there is usually a number of contributing factors, without any one of which pollution would not have occurred.

### 4.2 All reported incidents

In the following analysis, percentages have been rounded up or down to the nearest whole number.

During 1998, 28,670 pollution incidents were reported to the Environment Agency, a decrease of 7% compared to 1997. Each report was investigated and every effort made to substantiate and identify the cause and nature of the incident. In 1998, 17,863 incidents (62% of those reported) were substantiated, that is, there was evidence that a pollution incident had occurred. Of these substantiated incidents, 128 were classified as Category 1 (for definition of incident categories, see Appendix A).

Prior to and including 1990, only data for reported incidents were available. To maintain continuity, Figure 1 shows reported incidents from 1988 to 1998 in England and Wales. Unless otherwise stated, the remainder of the report is based on substantiated incidents only.

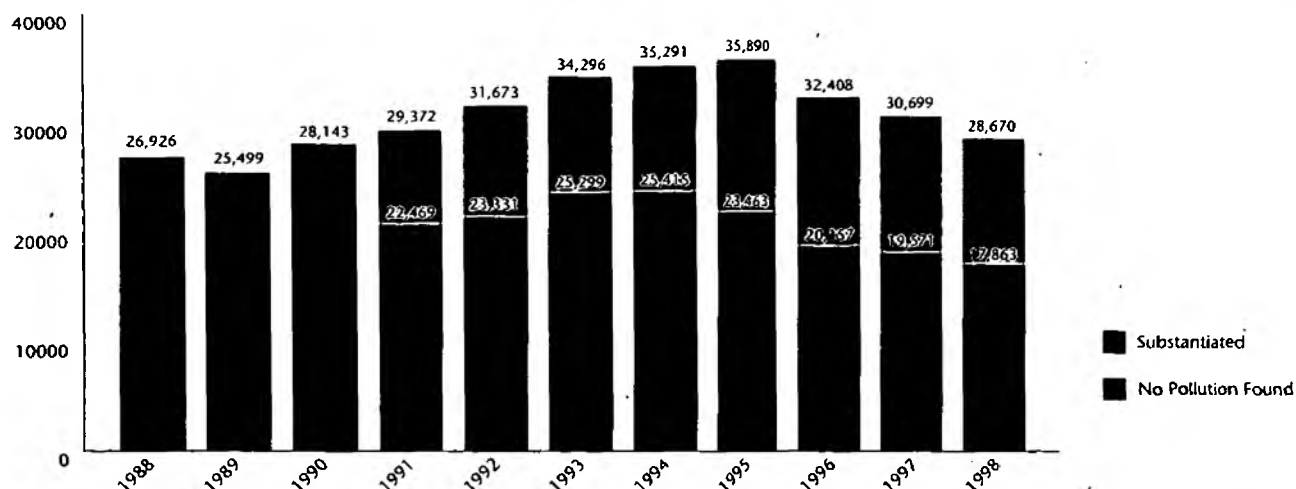
### 4.3 Regional distribution

There has been almost no change in the regional distribution of incidents in recent years. As in previous years Midlands Region had the most substantiated incidents (23% of the total) and Southern Region the least (6%). The number and type of incidents in each region are influenced by climate, topography, population and local economic activity. The number of incidents increased in the North West Region (by 2%) and fell in all the other regions when compared with 1997. The greatest fall was in the North East Region, where the number of incidents has fallen by 21% in a year. Figure 2 illustrates the total number of substantiated pollution incidents by region for 1998. Overall, the number of substantiated incidents fell by 9% compared with 1997. Table 1 shows a regional breakdown by incident category, and includes figures for unsubstantiated incidents.

### 4.4 Distribution by source of pollution

Agency staff endeavour to identify both the source of any pollution and the type of pollutant (Figure 3 and Table 2). The

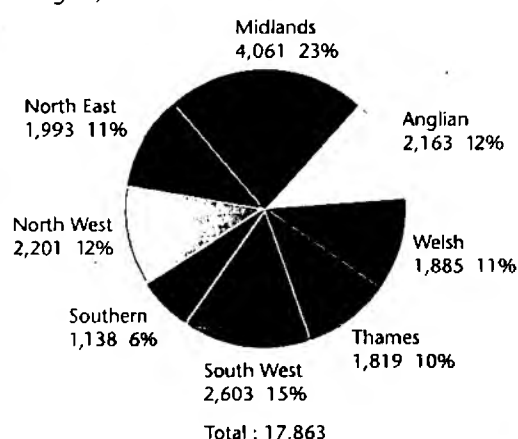
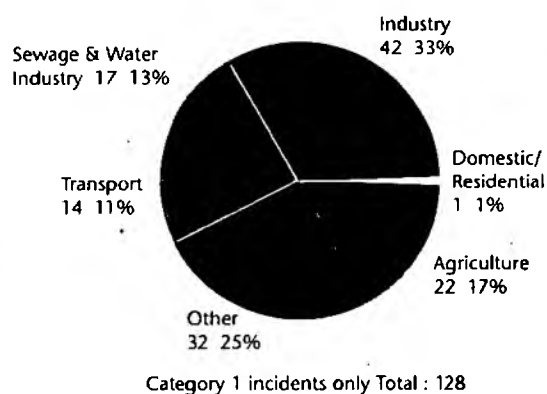
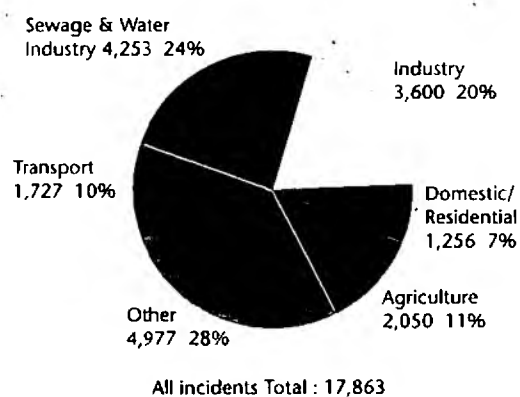
Figure 1 Total number of reported pollution incidents in England and Wales, 1988-98





**Table 1** Total number of reported pollution incidents in 1998 by incident category

Region	Substantiated			Total substantiated	Category 4 unsubstantiated
	Category 1	Category 2	Category 3		
Anglian	7	132	2,024	2,163	782
Midlands	17	192	3,852	4,061	1,315
North East	22	208	1,763	1,993	1,291
North West	25	246	1,930	2,201	1,638
Southern	17	52	1,069	1,138	1,456
South West	12	138	2,453	2,603	2,038
Thames	12	174	1,633	1,819	1,438
Wales	16	96	1,773	1,885	849
<b>TOTAL</b>	<b>128</b>	<b>1,238</b>	<b>16,497</b>	<b>17,863</b>	<b>10,807</b>

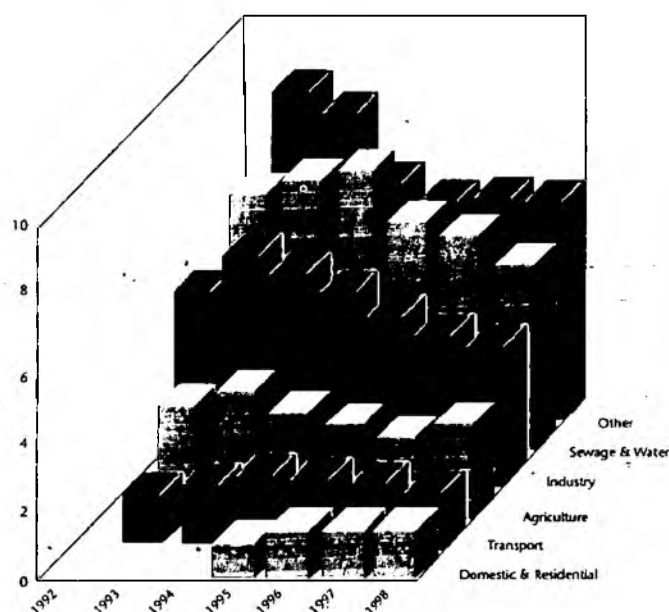
**Figure 2** Total number of reported pollution incidents by Agency region, 1998**Figures 3a and 3b** Distribution of substantiated pollution incidents by source, 1998

source of pollution is reported in six categories: agriculture, industrial, sewage and water industry, transport, domestic and residential and "other". "Other" sources include hospitals, crown-exempt sites, and incidents where the source was not traced.

The greatest proportion of incidents arose from "other" premises (28%) and from the sewage and water industry (24%).

#### 4.4.1 Historical trends

The trend in pollution incidents by source since 1992 is shown in Figure 4. It shows that there was an overall reduction in the number of substantiated incidents over time in most source categories. The obvious exception is transport incidents, which have remained almost constant. Incidents from the sewage and water industry, industry and agricultural sources have declined steadily. Data for domestic and residential sources were not collected separately prior to 1995.

**Figure 4** Trends in the number of pollution incidents by source, 1992-98

**Table 2** Total number of substantiated pollution incidents by source, 1998

Region	Agricultural	Industrial	Sewage & water	Transport	Domestic/ residential	Other source	Total	Percentage of total incidents
Anglian	189	371	473	305	255	570	2,163	12%
Midlands	418	807	986	507	151	1,192	4,061	23%
North East	190	398	645	161	115	484	1,993	11%
North West	321	533	342	141	170	694	2,201	12%
Southern	115	199	244	150	190	240	1,138	6%
South West	483	459	628	199	199	635	2,603	15%
Thames	70	369	437	164	176	603	1,819	10%
Wales	264	464	498	100	0	559	1,885	11%
TOTAL	2,050	3,600	4,253	1,727	1,256	4,977	17,863	
Percentage	11%	20%	24%	10%	7%	28%		

#### 4.5 Distribution by type of pollutant

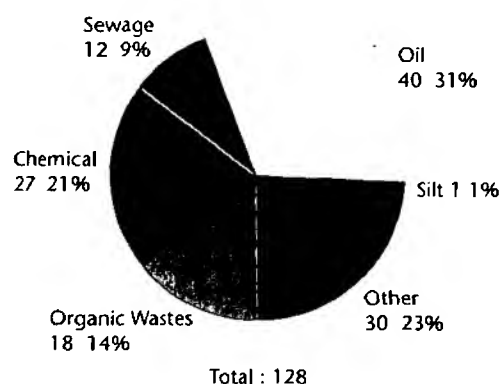
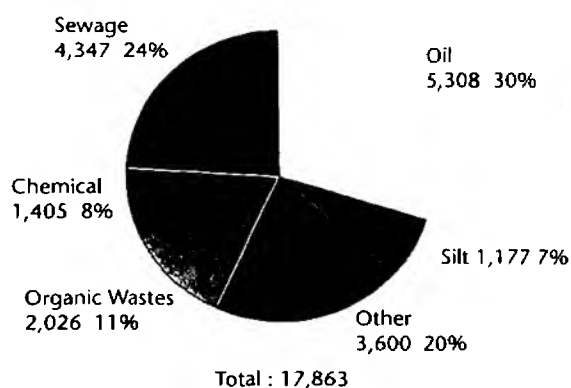
Pollutant types were also split into six categories: fuels and oils, sewage, chemicals, organic wastes, silt and "other" types (Fig 5). "Other" types include pollutants that do not fit into the other five categories, for example vehicle washings, natural causes, litter and incidents where the pollutant was not identified.

The largest number of pollution incidents by type were fuels and oils (30%), followed by sewage (24%). In the "other" type category were 20% of incidents. Natural causes (in the

"other" types category) accounted for 13% of "other" incidents, compared to 5% of incidents in 1997. The regional breakdown of pollutant types is shown in Table 3.

##### 4.5.1 Historical trends

The trend in pollution incidents by type since 1992 is shown in Figure 6. The overall reduction in the number of substantiated incidents over time is reflected in each type category. The number of incidents recorded as "other" type has decreased most sharply in recent years, in part as a result of improved recording systems.

**Figures 5a and 5b** Distribution of substantiated pollution incidents by type, 1998**Table 3** Total number of substantiated pollution incidents in 1998 by type of pollutant

Region	Organic wastes	Fuels & oils	Sewage	Chemicals	Silt	Other types	Total	Percentage of total incidents
Anglian	184	716	565	196	64	438	2,163	12%
Midlands	453	1,291	830	408	247	832	4,061	23%
North East	170	516	673	181	106	345	1,993	11%
North West	289	614	451	185	206	456	2,201	12%
Southern	85	443	295	79	47	189	1,138	6%
South West	484	692	610	162	231	424	2,603	15%
Thames	65	668	427	113	126	420	1,819	10%
Wales	294	368	496	81	150	496	1,885	11%
TOTAL	2,026	5,308	4,347	1,405	1,177	3,600	17,863	
Percentage	11%	30%	24%	9%	7%	20%		

Table 4 Total number of Category 1 (Major) substantiated pollution incidents by source, 1998

Region	Agriculture	Industrial	Sewage & water	Transport	Domestic/residential	Other	Total	Percentage
Anglian	0	0	0	1	1	5	7	5%
Midlands	2	8	0	2	0	5	17	13%
North East	5	4	6	3	0	4	22	17%
North West	4	8	5	3	0	5	25	20%
Southern	2	8	2	2	0	3	17	13%
South West	4	5	1	1	0	1	12	9%
Thames	2	4	1	1	0	4	12	9%
Wales	3	5	2	1	0	5	16	13%
Total	22	42	17	14	1	32	128	
Percentage	17%	33%	13%	11%	1%	26%		

#### 4.6 Category 1 incidents

Of the total of 17,863 substantiated incidents in 1998, 128 were classified as Category 1 (Major). This compares to 194 in 1997 and continues the trend of reduction in Category 1 incidents, which was interrupted by the increase in 1997.

Tables 4 and 5 show the number of Category 1 incidents in 1998 by source and type. Figure 3b shows the proportion of Category 1 incidents from the six sources. Industrial sources caused the largest number of Category 1 incidents, at 33%.

and the largest number by type were due to fuels and oils (31%). As in 1997, a number of Category 1 "other" types and sources were due to natural events that resulted in fish kills.

##### 4.6.1 Historical trends

The trend in Category 1 pollution incidents by source and type since 1992 is illustrated in figures 6a and 6b. There has been an overall reduction in the number of incidents over time in the majority of categories.

Figures 6a and 6b Substantiated category 1 incidents for pollutions by source and type 1992 - 1998

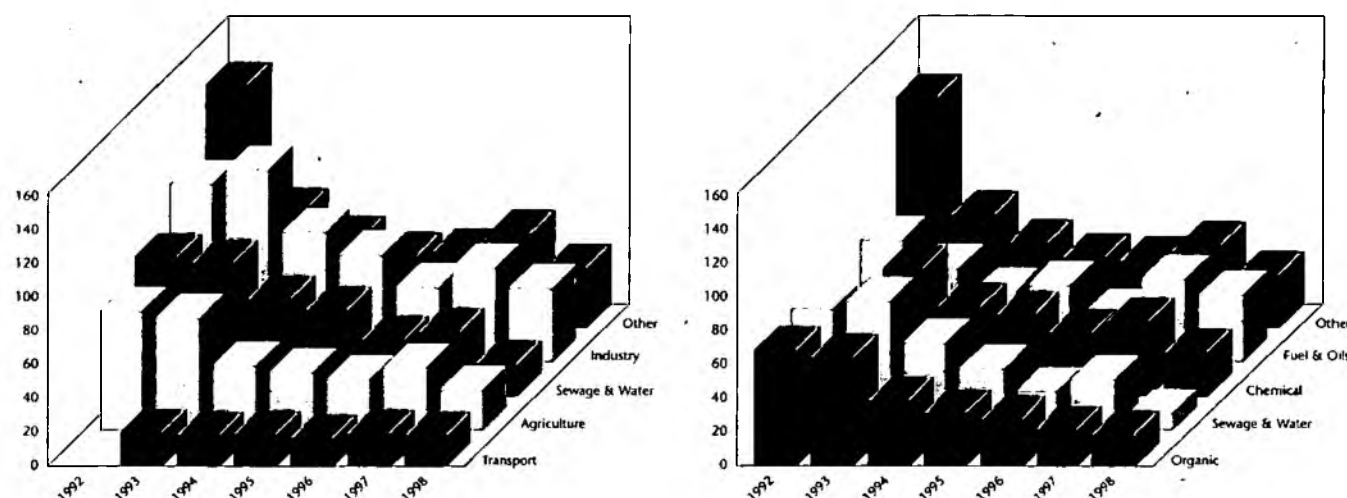


Table 5 Total number of Category 1 (major) substantiated pollution incidents by pollutant type in 1998

Region	Organic wastes	Fuels & oils	Sewage	Chemicals	Silt	Other types	Total	Percentage
Anglian	0	1	0	2	0	4	7	5%
Midlands	5	6	0	3	0	3	17	13%
North East	4	4	5	6	0	3	22	17%
North West	3	8	3	5	0	6	25	20%
Southern	1	11	2	0	0	3	17	13%
South West	2	4	1	3	1	1	12	9%
Thames	0	3	0	4	0	5	12	9%
Wales	3	3	1	4	0	5	16	13%
Total	18	40	12	27	1	30	128	
Percentage	14%	31%	9%	21%	1%	23%		

## 5 Analysis of incidents by source

### 5.1 Agricultural pollution incidents

#### 5.1.1 Total incidents

In 1998 a total of 2,050 substantiated pollution incidents arose from agricultural sources, accounting for 11% of all incidents.

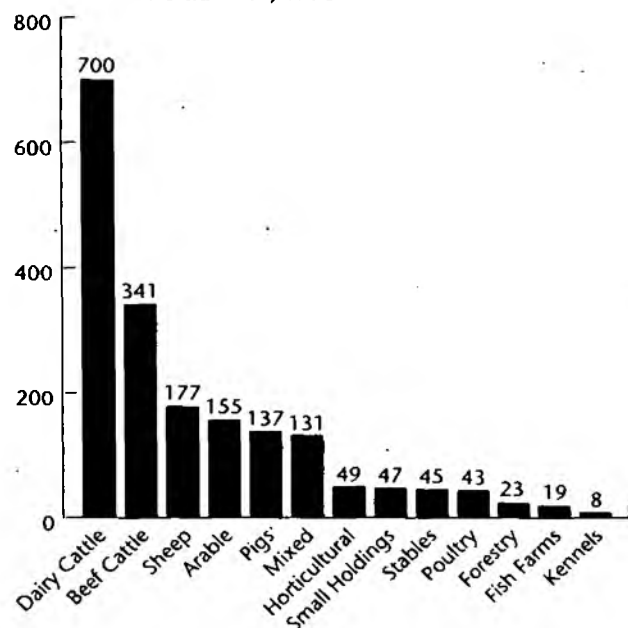
#### 5.1.2 Sources of agricultural pollution

The distribution of agricultural incidents by source is shown in Figure 7. As in previous years, the largest number came from dairy farming (34%). However, pollution from beef farming (16%) has increased significantly and is now the second most important source.

#### 5.1.3 Historical trends

Table 6 shows the number of pollution incidents in each region from 1992 to 1998. There was a significant increase in agricultural incidents in 1998, from 1,884 in 1997 to 2,050.

**Figure 7** Substantiated agricultural pollution incidents by source, where classified, 1998



probably as a result of unusually wet weather causing dirty water and slurry systems to be overwhelmed. However, there was still a slight decrease of 3% of incidents compared with the 1996 figures.

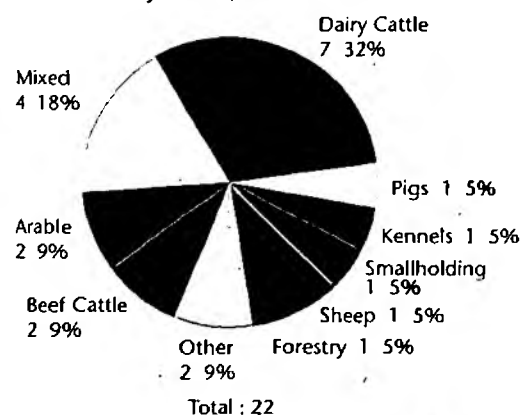
All the regions except Thames and Anglian recorded more agricultural incidents than in 1997. The most notable increases were in the North West (26% more) and South West (19% more).

#### 5.1.4 Category 1 incidents

Following a steady decrease in the number of Category 1 agricultural incidents from 1991-96, there was an increase in 1997. However, the downward trend has continued in 1998, with only 22 Category 1 incidents from agriculture recorded over the year, the lowest number ever recorded.

A breakdown of Category 1 incidents is shown in Figure 8, which only shows one significant change, with only two sheep dip incidents recorded, down from six in 1997.

**Figure 8** Substantiated Category 1 agricultural pollution incidents by source, 1998

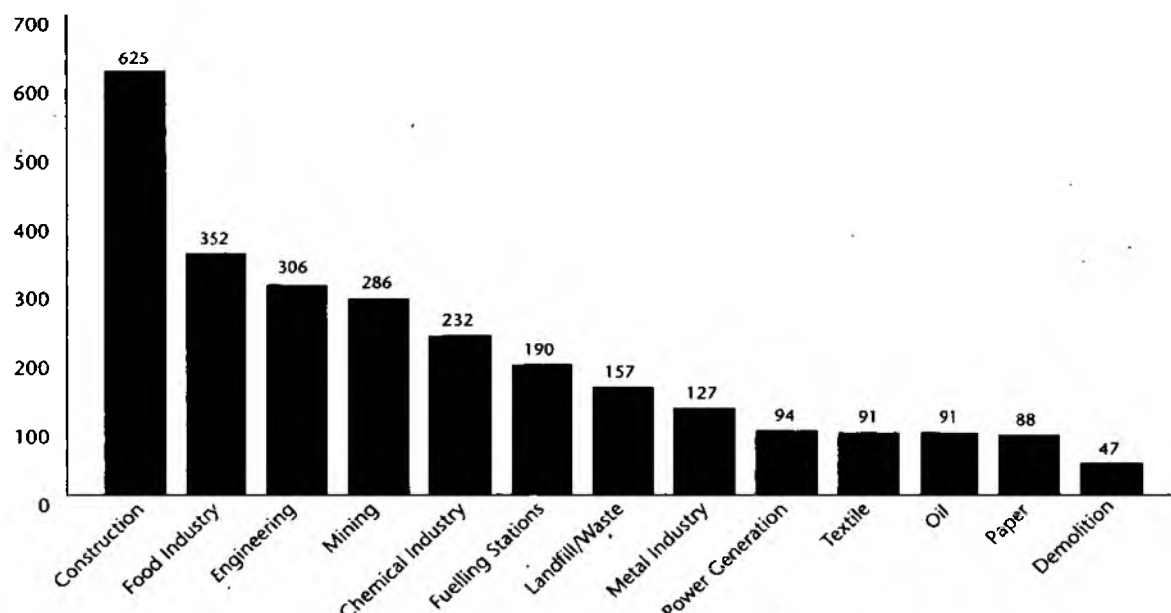


**Table 6** Total agricultural pollution incidents by region, 1992-98

	1992		1993		1994		1995		1996		1997		1998	
	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1
Anglian	283	3	356	0	326	1	212	1	200	2	193	1	189	0
Midlands	320	17	391	15	409	8	371	2	410	7	407	6	418	2
North East	231	6	148	7	396	5	220	7	166	0	170	4	190	5
North West	417	10	403	11	403	8	312	6	275	8	255	12	321	4
Southern	71	1	68	0	126	2	123	3	95	2	101	3	115	2
South West	911	20	943	24	1025	9	975	6	583	6	407	6	483	4
Thames	91	0	132	2	100	1	115	0	93	1	89	1	70	2
Wales	446	10	442	4	544	2	392	7	289	2	262	2	264	3
Total	2,770	67	2,883	63	3,329	36	2,720	32	2,111	28	1,884	35	2,050	22

Cat 1 - NRA and Environment Agency Category 1

Sub = Substantiated

**Figure 9 Substantiated industrial pollution incidents by source, where classified, 1998**

## 5.2 Industrial pollution incidents

### 5.2.1 Total incidents

A total of 3,600 pollution incidents from industrial sources were substantiated in 1998, 20% of the total.

### 5.2.2 Sources of industrial pollution

Figure 9 shows the main sources of industrial pollution incidents in 1998. As in previous years, the construction industry was the most frequently identified polluter, contributing 17% of industrial incidents (compared to 16% in 1997). Initiatives to tackle the number of incidents from construction are continuing. The food industry accounted for 10%, engineering 9% and mining industry 8%. The chemical industry (6%) was also significant.

### 5.2.3 Historical trends

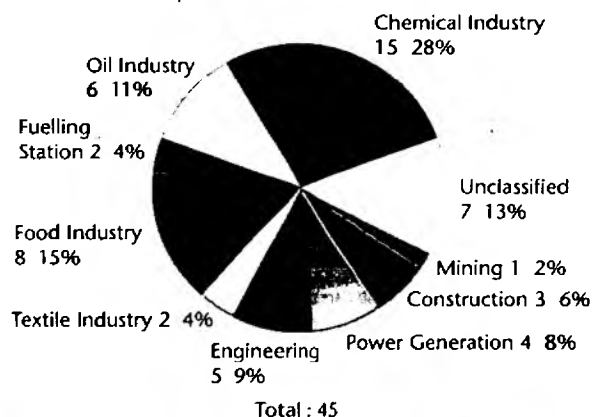
The total number of substantiated industrial pollution incidents in 1998 was the lowest since 1991, and represents a 3% decrease compared to 1997. The number of incidents increased in three regions (North West, Southern and Thames) and fell in the other regions.

Between 1993 and 1998 the number of industry related pollution incidents fell by 40%.

### 5.2.4 Category 1 incidents

Of the 128 Category 1 incidents, 42 (33%) arose from industrial sources. Midlands and North West Region (8 incidents) had the most, and North East and Thames Regions the least (4 each).

A breakdown of Category 1 industrial pollution incidents is shown in Figure 10. The chemical industry was the most frequently identified source (28%), followed by the food industry (15%).

**Figure 10 Substantiated Category 1 industrial pollution incidents, 1998****Table 7 Total industrial pollution incidents by region, 1992-98**

Region	1992a	1993	1994	1995	1996	1997	1998
Anglian	584	601	635	399	405	383	371
Midlands	715	727	769	749	833	814	807
North East	827	1,092	745	539	424	465	398
North West	279	1,335	821	948	648	506	533
Southern	236	203	262	239	212	138	199
South West	653	767	663	711	504	501	459
Thames	351	397	388	330	372	324	369
Wales	864	880	1,026	848	627	592	464
<b>TOTAL</b>	<b>4,509</b>	<b>6,002</b>	<b>5,309</b>	<b>4,763</b>	<b>4,025</b>	<b>3,723</b>	<b>3,600</b>

a includes oil-related incidents

### 5.3 Sewage and water industry related pollution incidents

#### 5.3.1 Total incidents

There were 4,253 substantiated sewage and water industry related pollution incidents in 1998, 24% of the total.

#### 5.3.2 Sources of sewage and water industry related incidents

Figure 11 shows the sources of sewage and water industry related incidents in 1998. For the first time in recent years, the biggest source of pollution was discharges from the foul sewer from Water Service Company (19%). Surface water outfalls (SWOs) caused 16% of incidents. The largest source of private sewage and water industry pollution was again SWOs (4%).

#### 5.3.3 Historical trends

Table 8 gives the figures for the regional distribution of sewage and water related pollution incidents from 1992 to 1998. This shows a decrease of 21% from 1997 to 1998. The 1998 figure of 4,253 is the lowest since records began. All regions experienced a decrease in incidents, except for Thames, which

only had one extra incident. The biggest decrease compared to 1997 was recorded in the Wales (20%).

#### 5.3.4 Category 1 incidents

Of the total number of sewage and water related incidents, 17 (less than 1%) were classified as Category 1. This represents 13% of all Category 1 incidents. Most of these occurred in North East and North West Regions (six and five incidents respectively).

The sources of Category 1 sewage and water related incidents are shown in Figure 12.

Figure 12 Substantiated Category 1 sewage and water related incidents, 1998

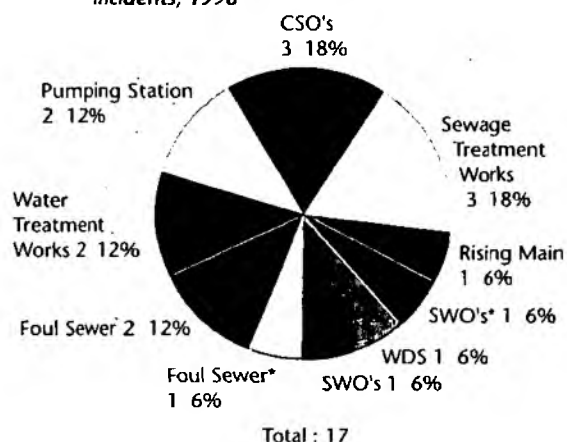


Figure 11 Substantiated sewage and water industry related pollution incidents by source, where classified, 1998

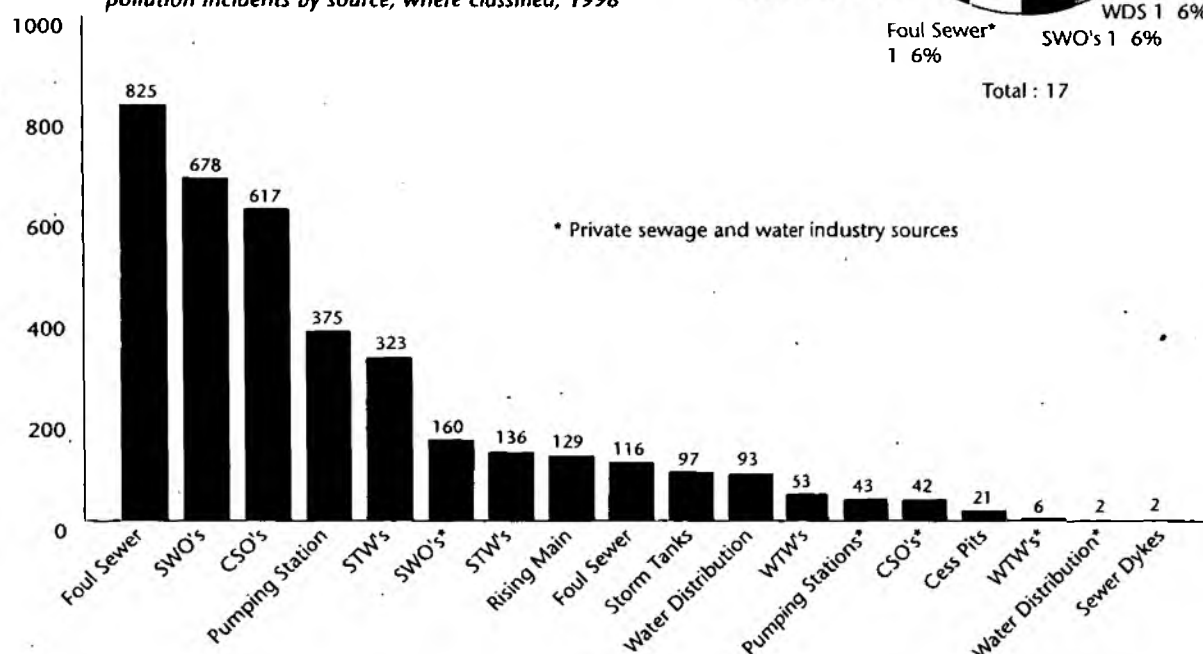


Table 8 Total substantiated sewage and water industry related incidents by region 1992-98

Region	1992	1993	1994	1995	1996	1997	1998
Anglian	657	586	714	557	461	555	473
Midlands	961	1,327	1,337	1,175	1,219	1,229	986
North East	1,055	726	1,032	1,013	722	876	645
North West	1,051	1,066	1,028	1,223	801	482	342
Southern	446	227	393	328	298	294	244
South West	1,019	1,124	1,209	1,469	889	789	628
Thames	373	421	414	487	471	436	437
Wales	858	898	892	905	738	704	498
<b>TOTAL</b>	<b>6,420</b>	<b>6,375</b>	<b>7,019</b>	<b>7,157</b>	<b>5,599</b>	<b>5,365</b>	<b>4,253</b>



Blood tanker spillage, M6 Birmingham: Midland Region



Dead fish  
following  
incident at  
Hungerford  
Trout Farm;  
Thames  
Region





Silt discharge  
after settlement,  
construction site,  
Wednesbury;  
Midlands Region



Silt run-off, construction site,  
Wednesbury; Midlands Region







Fuel tanker in River Piddle, Tolpuddle:  
South West Region



Good and Bad oil  
storage, Agency  
stand, Dorset  
Steam Fair:  
South West Region





Impact of  
discharge of  
china clay on the  
River Fal, Tregony  
Bridge, Cornwall:  
South West  
Region



Soil erosion;  
Anglian Region

## 5.4 Transport pollution incidents

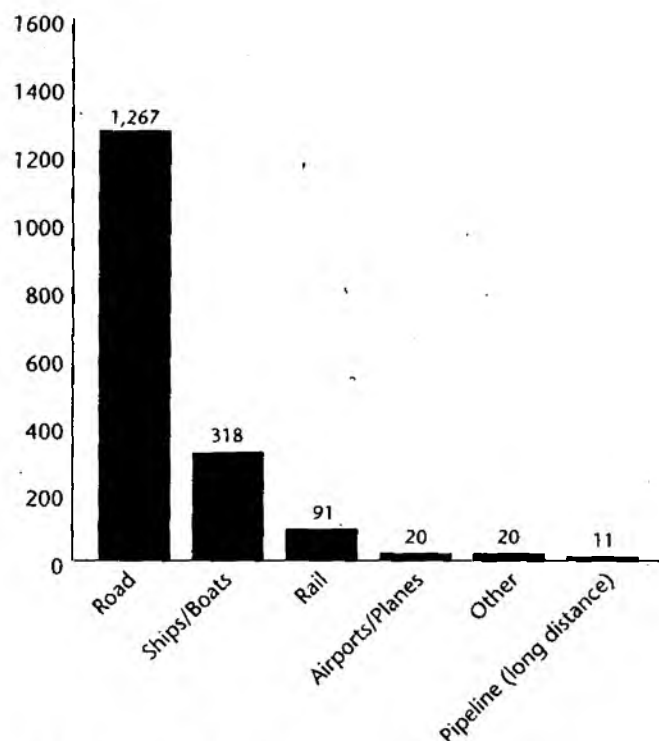
### 5.4.1 Total incidents

In 1998, transport related incidents (1,727) represented 10% of the total number of substantiated incidents.

### 5.4.2 Sources of transport related incidents

The distribution of transport incidents by source is shown in Figure 13. Of the total number of transport related pollution incidents, the overwhelming majority originated from roads (73%), mainly as a result of road traffic accidents. Ships and boats were involved in 18% and rail transport 5%.

Figure 13 Substantiated transport related pollution incidents by source, where classified, 1998



### 5.4.3 Historical trends

The changing number of transport incidents from 1993 to 1998 is shown in Table 9. The highest number of transport incidents was recorded in the Midlands (29%). This reflects the importance of the road networks in the region. In most

regions the number of incidents decreased, with the South West experiencing the greatest fall (13%).

### 5.4.4 Category 1 incidents

Fourteen transport incidents were classified as Category 1 in 1998, 11% of the total. Of these, nine were from road transport, three from ships and boats, and two from rail accidents.

## 5.5 Domestic and residential pollution incidents

### 5.5.1 Total incidents

Domestic and residential pollution incidents are reported as a separate source for the first time in this report. In 1998, domestic and residential pollution incidents (1,256) accounted for 7% of all incidents (see figure 14).

### 5.5.2 Sources of domestic and residential pollution incidents

The numbers of incidents from 1995 to 1998 are presented in Table 10. Separate records are not available prior to 1995. Anglian Region recorded the most pollution incidents (20%), followed by Southern (16%) and South West (15%). North East recorded the fewest incidents, with only 115 reported (9%).

Table 10 Total substantiated domestic and residential pollution incidents by region, 1995-98

Region	1995	1996	1997	1998
Anglian	186	267	294	255
Midlands	120	140	151	151
North East	89	142	138	115
North West	168	129	156	170
Southern	144	175	220	190
South West	159	180	222	199
Thames	223	207	198	176
Wales*	0	18	0	0
TOTAL	1,089	1,258	1,379	1,256

\*Environment Agency Wales records incidents in "other/not known" category.

Table 9 Total substantiated transport pollution incidents by region, 1993-98

Region	1993	1994	1995	1996	1997	1998
Anglian	99	394	216	361	323	305
Midlands	202	214	283	450	508	507
North East	146	166	129	167	169	161
North West	66	122	221	158	107	141
Southern	173	120	174	152	145	150
South West	403	355	337	253	230	199
Thames	192	195	217	201	164	164
Wales	217	217	211	173	120	100
TOTAL	1,498	1,783	1,788	1,915	1,766	1,727

## 5.6 "Other" sources of pollution

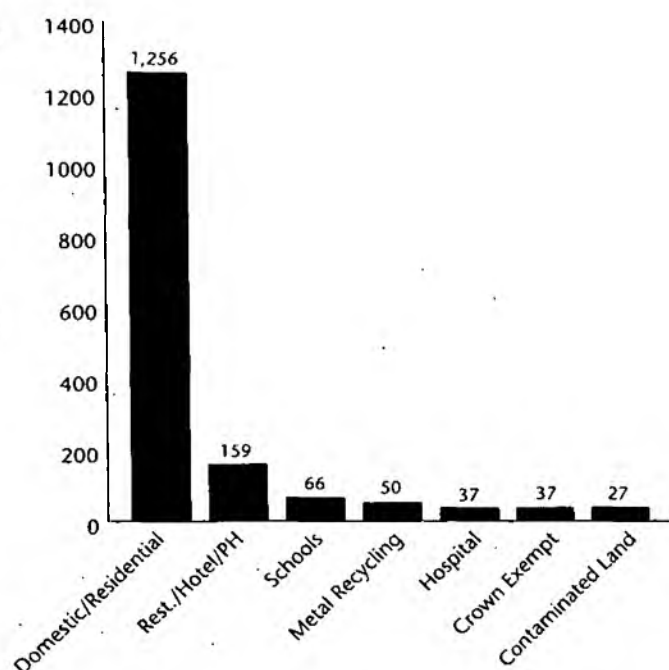
### 5.6.1 Total incidents

A total of 4,977 pollution incidents from "other" sources were substantiated in 1998, 28% of the total. This category therefore includes incidents where the source did not fall into one of the five main categories, and those where the source was not found.

### 5.6.2 "Other" sources of pollution

Of the "other" sources, 59% were incidents where the source could not be traced, representing 16% of all incidents. Those where the source was traced but not classified represented 34% of "other" sources. Restaurants and public houses accounted for 3%, and schools and other educational establishments 1%. These sources are shown in Figure 14.

Figure 14 Substantiated domestic and residential "other" sources of pollution incidents, where classified, 1998



### 5.6.3 Historical trends

The number of domestic and residential and "other" source pollution incidents fell in 1998. This fall continues the downward trends in "other" pollution incidents since 1992, which was only interrupted by the increase in 1997. Incidents from domestic and residential properties are separately categorised from 1995 in Table 11, hence the significant decrease in numbers of "other" incidents in that year. Since 1995 there has been a 9% decrease in incident numbers. All regions, except the North West Region, experienced a decrease in the number of "other" incidents. The region with the greatest decrease was the Midlands, which recorded 110 incidents fewer than in 1997.

### 5.6.4 Category 1 incidents

Of the 4,977 "other" source pollution incidents, 31 were classified as Category 1 - fewer than 1%. Of these, one came from a crown-exempt source, one from an educational establishment and one from a restaurant or hotel. The remaining 28 incidents could not be further classified, or were not traced. Anglian Region had only five Category 1 incidents in 1998 compared to 20 in 1997, many of which were due to natural causes, possibly as a result of the unusually wet weather reducing the impact of algal blooms.

Table 11 Substantiated "other" sources of pollution, by region, 1992-98

Region	1992*	1993	1994	1995	1996	1997	1998
Anglian	938	983	750	586	723	663	570
Midlands	2,424	2,229	2,166	1,561	1,253	1,302	1,192
North East	946	1,530	904	586	522	586	484
North West	1,523	786	1,158	845	807	654	694
Southern	336	684	415	227	257	276	240
South West	1,695	892	1,088	907	633	698	635
Thames	1,140	929	909	600	615	706	603
Wales	630	508	585	634**	458**	569**	559**
TOTAL	9,632***	8,541***	7,975***	5,946	6,508	5,454	4,977

\* Includes transport incidents

\*\* Environment Agency Wales records domestic/residential incidents in "other/not known".

\*\*\* Includes incidents from domestic and residential source.

## 6 Analysis of incidents by type

### 6.1 Organic wastes

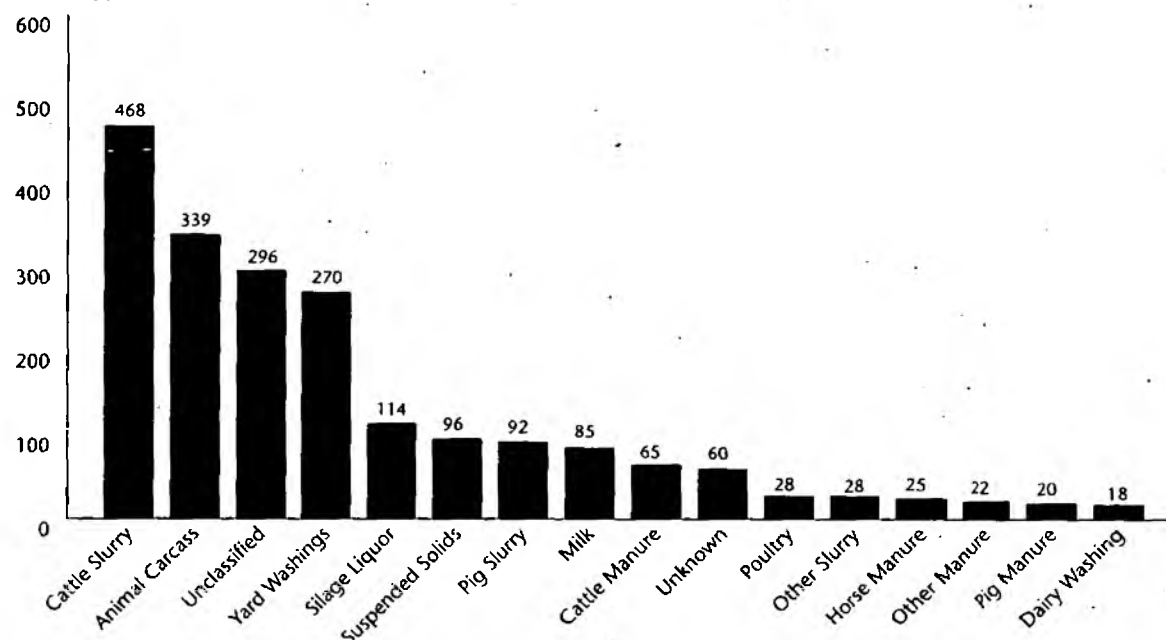
#### 6.1.1 Total incidents

There were 2,026 substantiated pollution incidents attributed to organic wastes in 1998, 11% of the total.

#### 6.1.2 Type of organic waste pollution

The distribution of organic waste pollution incidents is shown in Figure 15. Of this total, the largest number came from cattle slurry (23%). Other significant types were animal carcasses (17%) and yard washings (13%). A total of 296 incidents did not fit into the categories identified (15%). These included incidents related to vegetable matter and washings from kennels. Silage liquor accounted for 6% of all incidents. Only 3% of organic pollutants were not identified.

Figure 15 Substantiated organic waste pollution incidents by type, 1998



#### 6.1.3 Historical trends

Table 12 shows the regional numbers of organic waste incidents in the years 1993 to 1998, and substantiated farm data for 1992. The number of incidents in 1998 increased by 9%. When compared to 1997, however, the numbers of incidents were still below those recorded in 1996.

The increase was most marked in Southern Region (67%), North West Region (20%) and South West Region (14%). Thames was the only region to experience a decrease in the number of organic incidents since 1997 (8%).

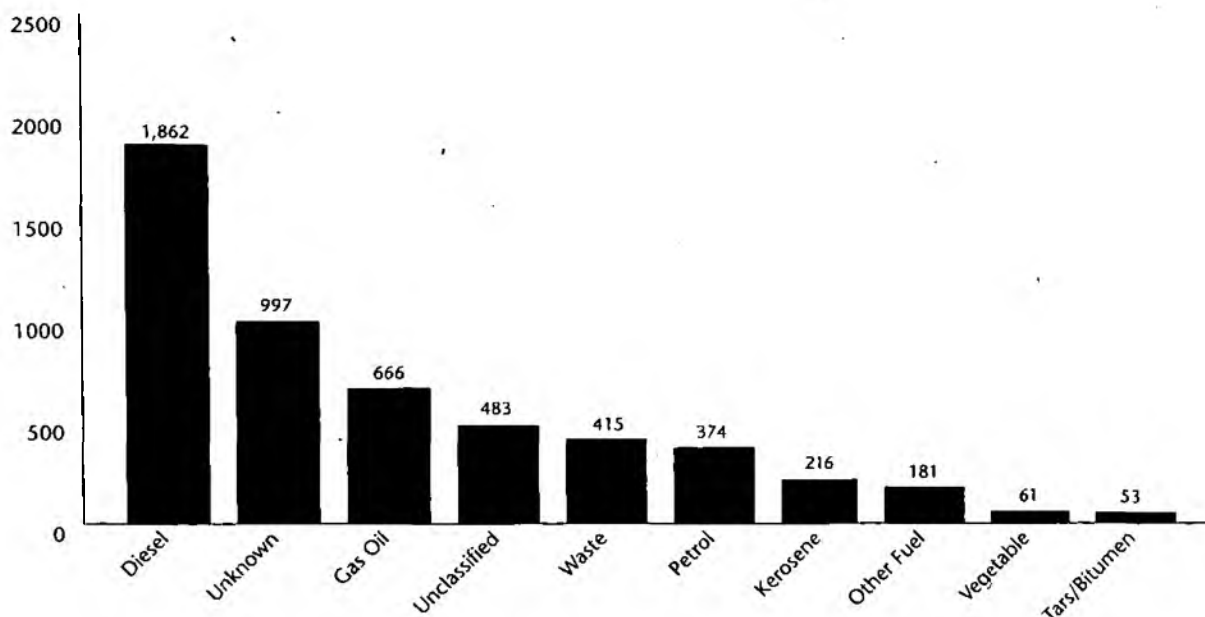
#### 6.1.4 Category 1 incidents

Of the 2,026 organic waste incidents, 16 (1%) were classified as Category 1. This represents 13% of the total number of Category 1 incidents. Cattle slurry accounted for eight of these and three occurred from "other" sources. Silage liquor, milk, pig slurry, poultry and other slurry all had one incident each.

Table 12 Total substantiated organic waste pollution incidents by region 1992-98

Region	1992*	1993	1994	1995	1996	1997	1998
Anglian	203	329	311	201	189	193	184
Midlands	296	381	368	419	436	445	453
North East	228	320	291	183	150	155	170
North West	406	398	479	408	341	241	289
Southern	63	101	102	84	66	51	85
South West	445	848	938	899	549	425	484
Thames	69	102	92	75	86	71	65
Wales	425	477	584	430	312	276	294
TOTAL	2,567	2,956	3,165	2,699	2,129	1,857	2,026

\* Substantiated farm incidents by type

**Figure 16** Substantiated fuel and oil pollution incidents by type, 1998

## 6.2 Fuels and oils

### 6.2.1 Total incidents

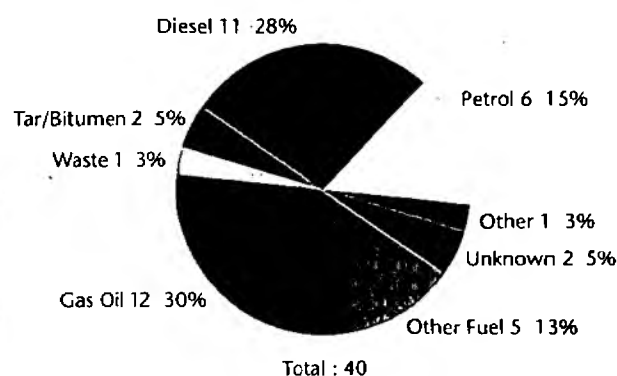
There were 5,308 substantiated fuel and oil pollution incidents in 1998, representing 30% of the total.

### 6.2.2 Type of fuel and oil pollution

Figure 16 shows the distribution of fuel and oil pollution incidents by type. Of these, diesel (DERV) was again the most common pollutant type, responsible for 35% of incidents. Gas oil caused 13% of incidents, and waste oil 8%. In 19% of cases the oil could not be identified.

### 6.2.3 Historical trends

Table 13 shows the numbers of fuel and oil pollution incidents between 1992 and 1998. There was a slight decrease in the number of incidents involving fuels and oils (4%). The biggest decreases since 1997 were in the North East and North West Regions, by 11% and 8% respectively. The only region to experience an increase compared to 1997 was Southern Region (4%).

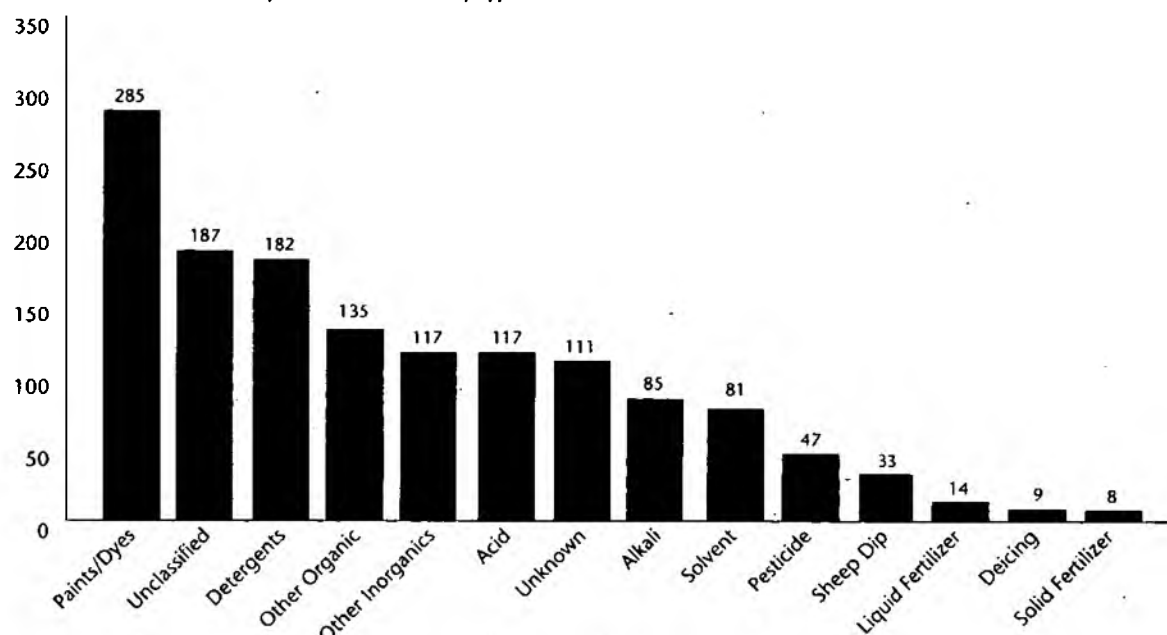
**Figure 17** Substantiated Category 1 fuel and oil pollution incidents by type, 1998

### 6.2.4 Category 1 incidents

Category 1 incidents involving fuels and oils accounted for less than 1% of the total number of substantiated fuels and oils incidents in 1998. Fuels and oils were involved in 40 Category 1 incidents (31% of the total), compared to 49 in 1997. The largest number of incidents occurred in the Southern Region (11 incidents) and North West Region (8 incidents). Anglian Region had the lowest number of such incidents, with only one. Details of Category 1 incidents are shown in Figure 17.

**Table 13** Total fuel and oil pollution incidents by region, 1992-98

Region	1992	1993	1994	1995	1996	1997	1998
Anglian	873	961	1023	734	763	761	716
Midlands	1,379	1,493	1,519	1,197	1,258	1,337	1,291
North East	561	597	705	668	562	579	516
North West	719	806	895	828	588	564	614
Southern	357	469	488	470	443	424	443
South West	945	661	865	909	768	739	692
Thames	876	896	896	780	817	715	668
Wales	426	490	517	439	388	423	368
<b>TOTAL</b>	<b>6,136</b>	<b>6,373</b>	<b>6,908</b>	<b>6,025</b>	<b>5,587</b>	<b>5,542</b>	<b>5,308</b>

**Figure 18** Substantiated chemical pollution incidents by type, 1998

## 6.3 Chemicals

### 6.3.1 Total incidents

In 1998 there were 1,405 substantiated chemical pollution incidents, representing 9% of the total.

### 6.3.2 Types of chemical pollutants

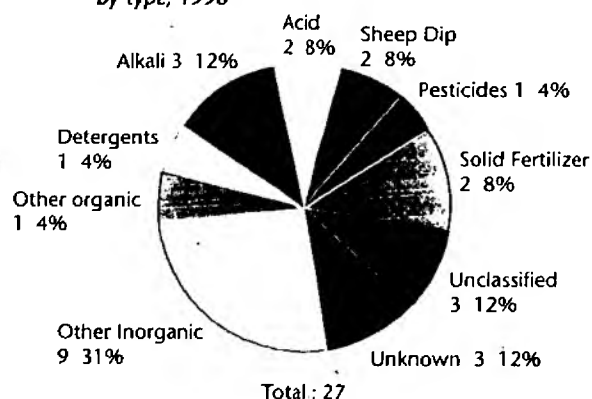
The distribution of chemical pollutants by type is shown in Figure 18. Chemicals that could not be classified were responsible for 13% of incidents. Pollution from paints and dyes was the largest identified type (20%), due in part to their visibility. Other major types were detergents (13%) and other organics and solvents (both 8%). In 6% of incidents it was not possible to identify the chemical responsible.

### 6.3.3 Historical trends

Table 14 shows the regional distribution of chemical incidents from 1992 to 1998. Since 1993 the lowest number of chemical incidents was recorded in 1998, a decrease of 11% compared to the 1997 figures. The most notable decreases were in the North East Region (23%) and Thames Region (22%). The only rise in incidents compared to 1997 was in Anglian Region (by 7%).

### 6.3.4 Category 1 incidents

Of the chemical incidents, 27 (2%) were classified as Category 1. This compares to 3% in 1997. Details of these are shown in Figure 19. These 27 incidents represented 21% of the national total of Category 1 incidents, a similar proportion to previous years. The most common type of Category 1 chemical incidents were from other organics (eight incidents). Sheep dip incidents only accounted for two incidents in 1998, compared to eight in 1997.

**Figure 19** Substantiated Category 1 chemical pollution incidents by type, 1998**Table 14** Total substantiated chemical pollution incidents by region, 1992-98

Region	1992	1993	1994	1995	1996	1997	1998
Anglian	209	198	301	201	239	183	196
Midland	206	281	299	317	446	430	408
North East	135	410	251	140	199	234	181
North West	236	568	383	359	308	228	185
Southern	57	100	129	108	102	89	79
South West	124	145	209	302	193	175	162
Thames	194	172	178	174	153	144	113
Wales	160	165	134	124	197	97	81
TOTAL	1,321	2,039	1,884	1,725	1,837	1,580	1,405



## 6.4 Sewage

### 6.4.1 Total incidents

In 1998 there were 4,347 substantiated sewage incidents, representing 24% of the total.

### 6.4.2 Types of sewage pollution

Figure 20 shows the distribution of substantiated sewage pollution incidents in 1998. Crude sewage was the most common type of pollutant, accounting for 45% of incidents. Other significant types were storm sewage (16%), septic tank effluent (13%) and treated effluent (9%). Sewage debris was responsible for 5% of incidents. The type of sewage was not classified in 5% of cases, compared to 14% in 1997.

### 6.4.3 Historical trends

The regional distribution of sewage incidents is shown in Table 15. Since 1992 the lowest number of sewage related incidents was recorded in 1998. There was a decrease of 19% of incidents compared to 1997. The number of incidents decreased in all regions, with the greatest fall in the North East Region (26%), Wales (25%) and the North West Region (24%).

Figure 20 Substantiated sewage pollution incidents by type, 1998

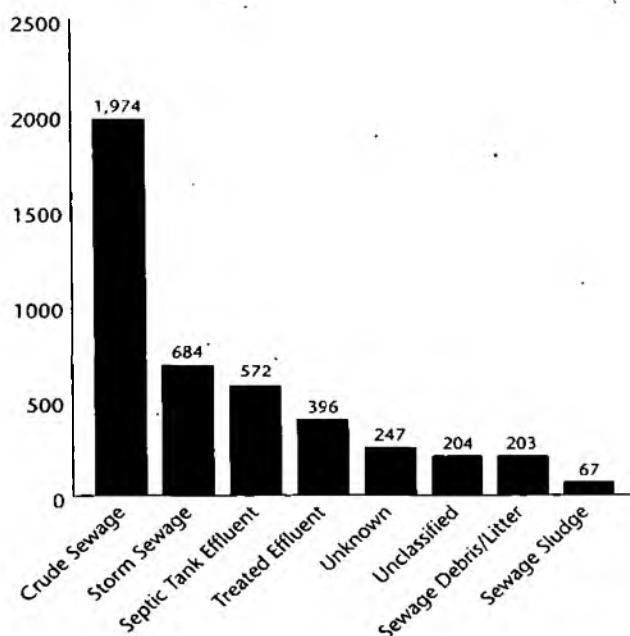


Table 15 Total substantiated sewage pollution incidents by region, 1992-98

Region	1992	1993	1994	1995	1996	1997	1998
Anglian	657	586	596	547	555	689	565
Midlands	961	1,327	1,320	935	991	999	830
North East	1,032	851	992	825	761	907	673
North West	1,026	1,066	894	1,103	843	594	451
Southern	392	215	322	351	346	378	295
South West	857	1,024	930	988	666	685	610
Thames	423	468	403	507	428	470	427
Wales	786	836	830	872	688	662	496
TOTAL	6,134	6,373	6,287	6,128	5,278	5,384	4,347

### 6.4.4 Category 1 incidents

There were only 12 Category 1 sewage pollution incidents in 1998, representing 9% of Category 1 incidents. This compares with 32 incidents recorded in 1997. As in previous years, the greatest number involved crude sewage (five incidents), as shown in Figure 21. The largest number were recorded in the North East Region (five incidents), and North West Region (three incidents). No incidents were recorded in Midlands, Anglian and Thames.

## 6.5 Silt

### 6.5.1 Total incidents

In 1998 there were 1,777 substantiated pollution incidents due to silt, representing 7% of the total (see Figure 22). This was a slight decrease (4%) compared with 1997.

### 6.5.2 Historical trends

The number of pollution incidents from silt has fallen steadily since 1995 (see Table 16). In 1998 North West Region experienced the greatest increase in incidents from silt (22%). The South West and Anglian Region had the greatest decrease (8% and 23% respectively).

### 6.5.3 Category 1 incidents

Only one Category 1 incident in Anglian Region was due to silt in 1998.

Figure 21 Category 1 sewage pollution incidents by type, 1998

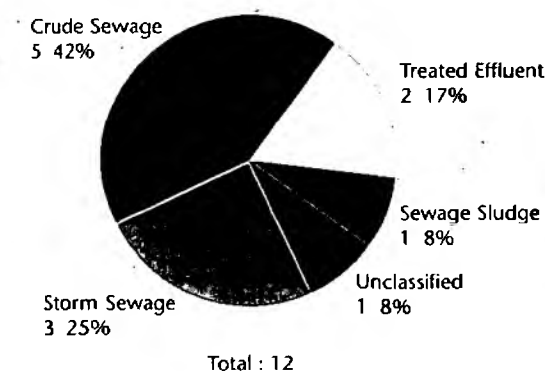




Table 16 Substantiated silt pollution incidents by region, 1995-98

Region	1995	1996	1997	1998
Anglian	61	72	49	64
Midlands	322	254	248	247
North East	63	113	106	106
North West	320	216	160	206
Southern	91	81	42	47
South West	98	84	252	231
Thames	152	139	132	126
Wales	299	305	255	150
TOTAL	1,406	1,264	1,224	1,177

## 6.6 "Other" types of pollutants

### 6.6.1 Total incidents

In 1998 there were 3,600 substantiated pollution incidents due to "other" pollutant types, representing 20% of the total.

Figure 22 Substantiated silt and "other" pollution incidents by type, where classified, 1998

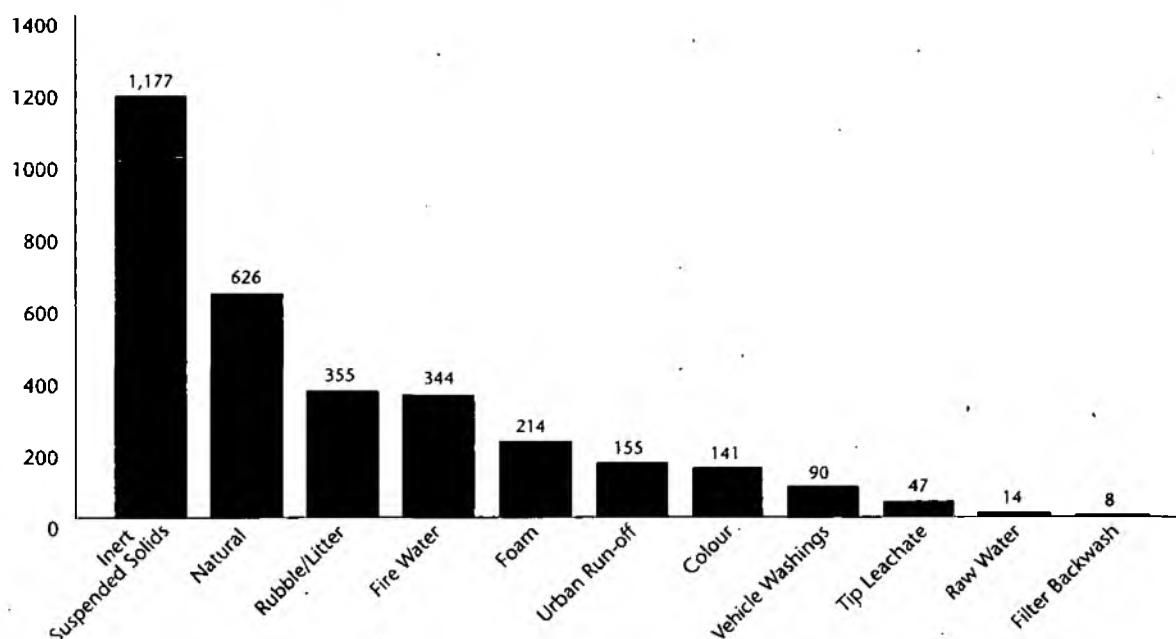


Table 17 Substantiated "other" pollution incidents by region, 1993-98

Region	1993	1994	1995	1996	1997	1998
Anglian	551	588	412	599	536	438
Midlands	1,394	1,389	1,069	920	952	832
North East	1,464	1,004	697	358	423	345
North West	818	881	699	522	373	456
Southern	470	275	131	151	190	189
South West	1,451	1,398	1,362	782	571	424
Thames	433	410	284	336	385	420
Wales	977	1,199	826	395	534	496
TOTAL	7,558*	7,171*	5,480	4,063	3,984	3,600

\* Include incidents caused by silt.

## 7 Legal action

### 7.1 Introduction

This section reports on the legal action relating to water pollution undertaken by the Environment Agency in 1998, under the Water Resources Act 1991. The figures do not include cases brought due to breaches of discharge consent, although specific cases where severe pollution has been caused are reported. Prosecutions are also occasionally brought under the Environmental Protection Act 1990, the Water Industries Act 1991 and the Salmon and Freshwater Fisheries Act 1975. Due to the length of time taken to bring a case to court, a large number of cases are outstanding at the end of each year. Data in Tables 18-24 relate only to incidents that occurred in 1998. To give a clearer picture, the total number of prosecutions relating to incidents in 1997 is shown in Appendix B, illustrating more fully the number of prosecutions relating to incidents in that year. In section 7.7, we report on examples of interesting prosecutions occurring in 1998 irrespective of the year of the offence.

### 7.2 Prosecution policy

A revised enforcement and prosecution policy was published by the Agency for consultation in April 1998. Each of the Agency's predecessor organisations had their own policies and the principal reason for the new document was to provide an integrated approach to environmental protection. The document set out five general principles which the Agency proposed to follow:

- firm but fair regulation;
- proportionality: enforcement proportionate to the risks to the environment and the seriousness of any breach of the law;
- consistency: this is important, but many factors will be taken into account, such as environmental impact and offending history;
- transparency: it should be clear why enforcement action has been taken;

- targeting: regulatory effort should be targeted at areas presenting the greatest risk to the environment.

The draft stated that where there is sufficient evidence, the Agency would normally prosecute where incidents or breaches have a significant effect on the environment. This proposal is broadly comparable to the existing policy, to prosecute Category 1 pollution incidents whenever there is adequate evidence to support the case. In considering Category 2 incidents, the circumstances surrounding the case are considered in detail, and formal cautions or warning letters are used where appropriate. Enforcement action is not always possible, either because the source cannot always be traced, because the incident was due to natural causes, or because it was the result of the actions of unknown persons.

The draft document was eventually adopted as the Agency's formal policy in November 1998.

### 7.3 Court cases

The regional distribution of prosecutions taken and convictions obtained for offences occurring in 1998 are shown in Table 18. By the end of December 1998, 92 of these prosecutions had been heard in court and more than 94% of these resulted in conviction. On 1 January 1999 there were 95 cases still to come to court. Legal action (prosecution or caution) was taken or expected in 17% of all Category 1 and 2 incidents. This compares with 20% in 1996 and 9% in 1994.

### 7.4 Cautions

In addition to instigating court action against polluters, the Agency can also issue formal cautions. The purpose of a caution is to deal quickly with less severe incidents, while reducing the chances of further pollution. There is no penalty attached to a caution, but it can be produced in court in the event of a further offence. There must be evidence of the polluter's guilt, the polluter must admit the offence and must give informed consent to being cautioned before a caution can be administered. Should the polluter refuse to sign the

Table 18 *Regional distribution of prosecutions and convictions for incidents by Agency region, 1998*

Region	Number of incidents prosecuted	Number of convictions	Outstanding prosecutions	Number of cautions issued	Number of cautions still to be issued at 31/12/98
Anglian	4	4	9	7	0
Midlands	14	8	6	6	0
North East	3	3	6	6	0
North West	13	13	20	17	6
Southern	7	7	9	3	0
South West	27	27	7	20	0
Thames	25	25	9	10	0
Wales	3	3	29	4	3
TOTAL	96	90	95	73	9

**Table 19 Prosecutions taken and convictions obtained for Category 1 and Category 2 incidents by pollution source, 1998**

Pollution source	Category 1			Category 2		
	Incidents	Prosecutions*	Convictions	Incidents	Prosecutions	Convictions
Agricultural	22	6	6	244	30	29
Industrial	42	3	1	401	28	27
Sewage & water industry	17	1	1	256	8	8
Transport	14	0	0	66	3	3
Other**	33	5	4	271	12	11
<b>TOTAL</b>	<b>128</b>	<b>15</b>	<b>12</b>	<b>1,238</b>	<b>81</b>	<b>78</b>

\*Includes outstanding prosecutions for Midlands Region

\*\* Includes domestic/residential pollution

**Table 20 Prosecutions taken and convictions obtained for Category 1 and Category 2 incidents by type of pollutant, 1998**

Pollution type	Category 1			Category 2		
	Incidents	Prosecutions*	Convictions	Incidents	Prosecutions	Convictions
Organic wastes	18	6	5	219	39	38
Oil	40	2	1	382	15	14
Sewage	12	2	2	236	11	10
Chemical	27	3	3	147	4	4
Other*	31	2	1	254	12	12
<b>TOTAL</b>	<b>128</b>	<b>15</b>	<b>12</b>	<b>1,238</b>	<b>81</b>	<b>78</b>

\* Includes silt pollution

caution, normal prosecution proceedings are instigated. The regional distribution of cautions issued in 1998 is also given in Table 18. By 1 January 1999, 73 cautions relating to cases in 1998 had been issued and 9 were outstanding.

## 7.5 Prosecutions by source and type

Tables 19 and 20 give the number of Category 1 and 2 prosecutions taken and convictions obtained by pollution source and type.

## 7.6 Penalties

Detailed information on fines for pollution offences is shown in tables 21, 22 and 23. The maximum fine available in the Magistrates Court under Section 85(6) of the Water Resources Act remains £20,000 and was imposed by a Magistrates Court for the first time ever in 1998. In determining the level of fine,

the court takes into account both the severity of the offence and the defendant's ability to pay.

The Magistrates Court can also impose a prison sentence of up to three months for pollution offences under the Water Resources Act 1991.

Imprisonment remains rare, although one such sentence was handed down in 1997 in the North West Region.

**Table 21 Fines and costs awarded on conviction for pollution incidents occurring in 1998**

Region	Range of fines £	Range of costs £
Anglian	1,000 - 12,000	700 - 3,613
Midlands	0 - 8,000	0 - 730
North East	3,500 - 8,500	700 - 7,650
North West	250 - 7,000	125 - 2,394
Southern	0 - 2,000	200 - 630
South West	0 - 6,000	90 - 665
Thames	250 - 12,000	400 - 3,259
Wales	500 - 1,000	150 - 907
All regions	0 - 12,000	0 - 7,650

**Table 22 Fines and costs awarded on conviction for pollution incidents occurring in 1998, by pollution source**

Pollution source	Range of fines £	Range of costs £
Agriculture	0 - 8,000	125 - 2,938
Industry	0 - 12,000	0 - 3,613
Sewage and water industry	0 - 8,500	90 - 7,650
Transport	750 - 1,500	192 - 700
Other	100 - 7,000	50 - 3,259

**Table 23 Fines and costs awarded on conviction for pollution incidents occurring in 1998, by type of pollutant**

Pollution type	Range of fines £	Range of costs £
Organic waste	0 - 12,000	90 - 2,393
Oil	750 - 6,000	192 - 1,632
Sewage	100 - 8,500	50 - 7,650
Chemical	1500 - 8,000	500 - 1,485
Other	0 - 7,500	0 - 700

## 7.7 Agency prosecutions in 1998

### 7.7.1 Introduction

This section highlights a number of incidents where legal action was taken in 1998 and early 1999. The cases illustrate both the types of incident that the Agency deals with, and the operation of the legal process.

### 7.7.2 Largest ever fine for an environmental offence

#### *Environment Agency v Milford Haven Port authority*

In the first case in which the Water Resources Act 1991 has been used to deal with a marine pollution, the Milford Haven Port Authority pleaded guilty to causing polluting matter to enter controlled waters (which includes coastal waters), contrary to section 85(1) of the Act and was fined £4 million, the largest ever fine for a pollution incident. The Port Authority was also ordered to pay £825,000 in costs.

The prosecution followed extensive investigations after the *Sea Empress*, which was bringing crude oil to Milford Haven in South Wales, ran aground on 18 February 1996 at St Ann's Head which lies at the entrance of the Milford Haven waterway. Over a period of seven days approximately 72,000 tonnes of light crude oil and 250 tonnes of heavy fuel oil were released from the ship.

Most of the coastline affected was within the Pembrokeshire Coast National Park. In the main area affected there were about 35 Sites of Special Scientific Interest, two National Nature Reserves and around Skomer, one of the UK's three Marine Nature Reserves.

The case was complex and involved great effort and resources to prepare over an extended period. The Agency decided to proceed with the case in the view of the extent of the environmental damage, the view that the incident was avoidable and the need to deter such incidents in the future.

The Environment Agency's Chief Executive stated that the case was "an important landmark in environmental protection and the extent of the financial consequences of this incident will cause all those involved in oil production and transportation to review their procedures". Extensive studies and reviews of the incident have been undertaken, which, together with the results of the case, should lead to safety improvements to protect the environment at all ports.

The Port Authority have appealed against the sentence and the Court of Appeal is expected to consider the matter later this year.

### 7.7.3 Maximum fine for oil pollution

#### *Environment Agency v Shell UK Ltd.*

On 19 October 1998 Shell UK Limited were fined £20,000 after causing pollution in the Manchester Ship Canal on 20 August 1997. This is the maximum penalty a Magistrate's Court can impose for a pollution offence. The company was also ordered to pay the Environment Agency £4,540 in costs.

Refined oil from the Stanlow manufacturing complex entered the Manchester Ship Canal. The oil was being pumped across the site when a problem was reported and the pipe was checked for blockages. However, a drain valve was not closed following the checks, and pumping continued, resulting in 188 tons of oil being lost from the pipework, with 140 tons entering the canal. The incident was reported five miles away from its source and the clean-up operation lasted about ten days.

The magistrate stated that Shell did not have adequate measures in place to prevent any loss on the site entering the Manchester Ship Canal.

### 7.7.4 Construction industry fined for causing oil pollution

#### *Environment Agency v Balfour Beatty Ltd*

A number of oil pollution incidents result in prosecution. The following incident is a typical example.

On 14 November 1997 oil was delivered to a 6,000-litre oil storage tank serving warm-air blowers on the site of construction company Balfour Beatty Ltd, Plant Division, at Raynesway, Derbyshire. The following day the company discovered that oil had been lost from the system. Believing that the oil had entered the foul sewer, the company immediately notified Severn Trent Water, who informed the Agency. Courtaulds, who abstract water from the Derwent at their Spondon site, also reported oil on the river. The investigating officer found neat red diesel flowing from a surface water sewer serving the site, and accumulated in pools along the river margin, with iridescence covering the river surface. Inspection of the site revealed that a tap fitted on the oil distribution system had been opened, allowing approximately 5,000 litres of oil to escape.

Oil affected 20km of river, including a major recreational fishery. The Agency's own workforce was deployed to install oil booms, and related costs of £2,700 were recovered from the company. Severn Trent Water's drinking water abstraction at Church Wilne, approximately 15km downstream, was also affected.

The incident highlights the need for companies to understand their site drains and to ensure that oil storage and delivery systems are secure and regularly inspected. The company was fined £13,000 by Derby magistrates when the case came to court in April 1998.

### 7.7.5 Consent failure

#### *Environment Agency v Celtic Energy Ltd.*

It is vital that companies take their responsibility for complying with discharge consents seriously. Failure to do so may result in the service of an enforcement notice, caution or in prosecution. Celtic Energy operates an open-cast coal mine at Park Slip West in South Wales. They hold an Agency consent to discharge water from the site to the Nant Graig yr Aber, a tributary of the River Kenfig. To comply with the consent, water from the working face, which is contaminated with

suspended solids, has to be transferred from the coal face to settlement lagoons for treatment. The treated water is then pumped to the river. Following reports from members of the public in July 1997 that the River Kenfig was discoloured, Environment Protection Officers found that the de-watering pumps at the site had been left running un-supervised. The pumps had emptied a sump of water and had then started to pump slurry. As a result, the settlement lagoons were overwhelmed and silt and sediment discharged to the river, polluting its entire length. A second, similar, incident occurred on 24 August 1997.

The case came to court on 21 April 1998, when the company pleaded guilty to failing to comply with its consent and endangering fish. Bridgend Magistrates fined the company a total of £18,000, made up of a fine of £8,000 for each consent breach and £1,000 for each charge of endangering fish. The company was also ordered to pay £1,586 towards the Agency's legal costs.

### 7.7.6 First ever blue-green algae prosecution

#### *Environment Agency v Anglian Water*

Anglian Water Services were the first ever company to be fined for introducing blue-green algae into a water course. On 15 October 1997 a routine biology survey found evidence of blue-green algae on the margins of Louth Canal. The next day officers returned to the site to find that the water had turned bright green. The source of algae was traced upstream to waste water lagoons situated at the Covenham Water Treatment Works of Anglian Water Services. Water from the lagoons, which was bright green, overtopped an overflow weir and entered the watercourse.

The incident could have been avoided with better site management. As a result, Anglian Water was fined £5,000, with £1,578 costs for causing poisonous, noxious or polluting matter to enter the Louth Canal, contrary to the Water Resources Act 1991, Section 85(1).

### 7.7.7 Large fine for oil spill

#### *Environment Agency v British Energy Generation*

British Energy Generation were fined £70,000, with £11,500 costs, for causing oil pollution of the underlying aquifer at their Dungeness B Nuclear Electric Power Station in Kent. The company had reported the loss of 190,000 litres of diesel in January 1998 and in court they asked for a second offence involving the loss of a further 30,000 litres in July to be taken into consideration. The oil leaked into the underlying aquifer from an oil tank supply line in an 80-metre long service trench, which was not sealed. The leak was detected at the end of December, but the source of the pollution was not identified until 22 January.

Four water supply boreholes were switched off to reduce the risk of contamination and two were still closed in January 1999. The site is also surrounded by a number of nature conservation sites of national and international importance.

In the Agency's view, the company had failed to identify the possible risk to groundwater, had poor metering records, making it impossible to appreciate the extent of the diesel loss, and failed to monitor the underground pipeline used to carry the diesel. The construction of the pipeline, which made inspection difficult, was also a factor. The remedial costs in this case have already exceeded £500,000 and are expected to come to about £1.5 million.

### 7.7.8 Litter

In an unusual case, an individual was prosecuted for causing solid waste matter to enter controlled waters, contrary to Section 85(1)/85(6) of the Water Resources Act, 1991. During a fishing trip in the Thames Estuary in June 1998, one of the crew of a chartered boat emptied the bin which had been used to collect the day's waste into the estuary off Southend. Such cases are rare, in part due to the difficulty of gathering evidence. However, in this case a guilty plea was entered and a fine of £250 imposed, plus costs of £400, when the case came to court on 28 October 1998.

## 7.8 Recovery of costs

The "Polluter Pays Principle" was introduced by the EC in 1973 in the first Programme of Action on the Environment, and was inserted into Article 130R(2) of the Treaty of Rome by the Single European Act (1986). The Water Resources Act 1991 contains the legislation for the recovery of the costs of water pollution from the polluter in England and Wales.

Prior to 1995, the recovery of clean-up costs in some regions was normally considered as part of a criminal prosecution. Section 161 of the Water Resources Act, however, gave the Agency the power to make a civil claim for clean-up costs independent of any criminal action. Following a study of cost recovery, new guidance was introduced in April 1995 to standardise the approach in all the regions. Under these guidelines, investigation and clean-up costs are recovered directly whenever the polluter is identified and more than one hour is spent on an incident, irrespective of any legal action as a result of the pollution. Table 24 illustrates the costs recovered in 1998. Although there were fewer such recoveries in 1998 (see Table 24) the overall total recovered was up by 14%, with costs recovered in approximately 18% of all incidents.

**Table 24 Costs recovered by each Agency region, 1998**

Region	Number of recoveries	Total amount billed £	Range of costs billed £
Anglian	431	£98,000	£25 - £4,550
Midlands	389	£219,000	£34 - £36,184
North East	506	£109,327	£45 - £5,213
North West	450	£145,518	£18 - £24,662
Southern	280	£388,854	£27 - £72,033
South West	626	£175,008	£27 - £6,778
Thames	175	£62,112	£20 - £2,609
Wales	303	£104,821	£34 - £4,462
All regions	3,160	£1,302,640	£18 - £72,033

## 8 Conclusions and recommendations

Some clear trends have become evident when looking at this and earlier reports. They indicate where effort is needed to reduce the impact of pollution incidents on water quality and to capitalise on the benefits of investment in sewerage and sewage treatment.

### 8.1 Reduction in water pollution incidents

There has been a fall in the number of reports of water pollution for three consecutive years, and in the number of substantiated incidents for four. The fall is apparent in all but one of the Agency's regions and in all categories of incident. However, the increase in the number of incidents involving all kinds of organic waste, beef cattle farms and construction activities, while possibly reflecting the very wet weather, are a cause for concern. Further analysis of these incidents is needed to identify underlying trends.

### 8.2 Diffuse pollution

As improvements in water quality resulting from the major investment programmes of the WSPLCs occur, the impact of diffuse pollution is becoming more apparent. Examples of bathing waters affected by rural and urban pollution from diffuse sources have already been reported. The impact of development in urban areas and changing agricultural practices in rural areas can be seen in a decline in the ecology of watercourses, and are not readily detected with conventional water-quality monitoring. The Agency has already taken some steps to identify the causes of diffuse pollution and to develop and promote appropriate techniques to tackle them. It is likely, however, that the significance of diffuse pollution will increase.

### 8.3 Pollution prevention

Pollution from diffuse sources and unregulated activities is difficult to tackle through regulation, since enforcement occurs after pollution has taken place and the environment has been damaged. The Agency endeavours to prevent pollution by providing authoritative advice in the form of easily understood pollution prevention guidance, codes of practice and other materials. Much of the guidance is of relevance in all sectors, whether formally regulated or not.

Particular efforts have been made in recent years to reduce oil pollution and to work with farmers and with construction companies. However, the increase in the proportion of incidents involving oil and from agricultural and construction activities in the last year indicates that there is much more to be done.

### 8.4 Fines

Although a record fine has been imposed in the *Sea Empress* case, the general level of fines imposed for water pollution offences remains relatively low. In many cases the fine is far less than

the cost of preventing the pollution would have been in the first place. This issue was highlighted at the Agency's Annual General Meeting in London on 2 September 1998, where the Agency's tough approach in the field was contrasted with the disappointing level of fines imposed by the courts. The Agency's Chief Executive, Ed Gallagher, told the AGM: "These fines of a few thousand pounds are no deterrent to multi-million pound companies - we want fines that reflect the seriousness of the crime."

Efforts have been made to provide background information on environmental crime for magistrates and to raise awareness of the impact of pollution. However, the maximum fine available to magistrates in water pollution cases, £20,000, was applied in only one case in 1998.

### 8.5 Oil storage regulations

Although the number of oil and fuel incidents has fallen for four years, the proportion of such incidents has steadily increased and now accounts for 30% of all water pollution incidents. A voluntary approach to the problem was initiated in 1995, but there has been little progress in the last three years. Agency data indicates that at least 60% of the major and significant incidents could have been prevented if oil storage tanks were adequately bunded. Consultation on proposals for regulations on the storage of oil and fuel was undertaken at the end of 1996 and an announcement on whether the Government intends to proceed with these will be made later in 1999.

### 8.6 Farm pollution - Groundwater Regulations

The Agency's concern over the impact of synthetic pyrethroid (SP) sheep dips on the aquatic environment has been a repeated theme in these reports in recent years. The introduction of the Groundwater Regulations in 1999 will require the "Authorisation" of the Agency for disposal operations for both sheep dip wastes and pesticide residues, and the Agency's pollution prevention guidance for sheep dipping has been amended to reflect this change. It is expected that this will give rise to a very significant initial workload, but should result in better protection for the environment from these potentially highly damaging discharges.

### 8.7 "Natural pollution"

In recent years there have been a number of major and significant incidents for which there has been no simple explanation. Many of these are ascribed to "natural" causes. The most common of these is a low level of dissolved oxygen as a result of algal blooms, although the incident in Hungerford (Section 2.1.5) appears to have involved a natural toxin. There is often an underlying water-quality problem.

with eutrophication becoming increasingly common. A few schemes have been implemented to tackle eutrophication, most notably in the Norfolk Broads. A proposed strategy for countering excessive nutrient loads was published for consultation by the Agency in December 1998. This recognises the need to take a catchment-wide approach to assess eutrophication, quantify the contributions from the various sources and to apply the best control practices. Unless such an approach is taken, there will be an increasing risk of major incidents, especially at times when the environment is already stressed, for example under high temperature or drought conditions.

## 9 References

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- Environment Agency (1999), *Sheep dip strategy*, R&D technical report P237, from WRC.



# Appendices

## Appendix A

### Definition of pollution incident categories

#### Category 1

A major incident involving one or more of the following:

- (a) potential or actual persistent effect on water quality or aquatic life;
- (b) closure of potable water, industrial or agricultural abstraction necessary;
- (c) extensive fish kill;
- (d) excessive breaches of consent conditions;
- (e) instigation of extensive remedial measures;
- (f) significant adverse effect on amenity value;
- (g) significant adverse effect on site of conservation importance.

#### Category 2

A significant incident involving one or more of the following:

- (a) notification of abstractors necessary;
- (b) significant fish kill;
- (c) readily observable effect on invertebrate life;
- (d) water unfit for stock watering;
- (e) bed of watercourse contaminated;
- (f) amenity value to downstream users reduced by odour or appearance.

#### Category 3

A minor incident resulting in localised environmental impact only. Some of the following may apply:

- (a) notification of abstractors not necessary;
- (b) fish kill of less than 10 fish (species of no particular importance to the affected water);
- (c) no readily observable effect on invertebrate life;
- (d) water not unfit for stock watering;
- (e) bed of watercourse only locally contaminated;

- (f) minimal environmental impact and amenity value only marginally affected.

#### Category 4 (unsubstantiated)

A reported pollution incident that upon investigation proves to be unsubstantiated, that is, no evidence can be found of a pollution incident having occurred.

## Appendix B

Prosecutions relating to pollution incidents that occurred in 1997 (irrespective of the date of hearing).

Region	Prosecutions	Convictions
Anglian	44	42
Midlands	28	23
North East	20	19
North West	51	47
Southern	12	12
South West	34	34
Thames	30	30
Wales	35	29
All regions	254	236

## Appendix C

### Pollution prevention materials

The following pollution prevention publications are available from the agency:

- |  |   |
|--|---|
| <input type="checkbox"/> PPG1 - General guide to the prevention of pollution of controlled waters      | <input type="checkbox"/> Follow the Oil Care Code                     |
| <input type="checkbox"/> PPG2 - Above ground oil storage tanks   | <input type="checkbox"/> Oil Care at Home                             |
| <input type="checkbox"/> PPG3 - The use and design of oil separators in surface water drainage systems | <input type="checkbox"/> Oil Care at Work                             |
| <input type="checkbox"/> PPG4 - Disposal of sewage where no mains drainage is available                | <input type="checkbox"/> Oil Care on Your Boat                        |
| <input type="checkbox"/> PPG5 - Works in, near or liable to affect watercourses                        | <input type="checkbox"/> Use Your Brain sticker                       |
| <input type="checkbox"/> PPG6 - Working at demolition & construction sites                             | <input type="checkbox"/> Industrial Oil Tank sticker                  |
| <input type="checkbox"/> PPG7 - Fuelling stations: construction & operation                            | <input type="checkbox"/> Domestic Oil Tank sticker                    |
| <input type="checkbox"/> PPG8 - Safe storage & disposal of used oils                                   | <input type="checkbox"/> Car Window sticker                           |
| <input type="checkbox"/> PPG9 - Pesticides   | <input type="checkbox"/> River pollution and how to avoid it          |
| <input type="checkbox"/> PPG10 - Highway depots  | <input type="checkbox"/> Chemical pollution and how to avoid it       |
| <input type="checkbox"/> PPG11 - Industrial sites  | <input type="checkbox"/> Pollution from your home and how to avoid it |
| <input type="checkbox"/> PPG12 - Sheep dip   | <input type="checkbox"/> Solvent pollution and how to avoid it        |
| <input type="checkbox"/> PPG13 - The use of high-pressure water & steam cleaners                       | <input type="checkbox"/> Silt pollution and how to avoid it           |
| <input type="checkbox"/> PPG14 - Boats and marinas   | <input type="checkbox"/> Farm pollution and how to avoid it           |
| <input type="checkbox"/> PPG15 - Retail premises   | <input type="checkbox"/> Silage pollution and how to avoid it         |
| <input type="checkbox"/> PPG16 - Schools and other educational establishments                          | <input type="checkbox"/> Farm waste management plans                  |
| <input type="checkbox"/> PPG17 - Dairies and other milk-handling operations                            | <input type="checkbox"/> Wrong connections                            |
| <input type="checkbox"/> PPG18 - Managing firewater and major spillages                                | <input type="checkbox"/> 0800 card                                    |
| <input type="checkbox"/> PPG19 - Garages and vehicle service centres                                   | <input type="checkbox"/> Farm Waste Regulations 1991                  |
| <input type="checkbox"/> PPG20 - Dewatering underground ducts and chambers                             | <input type="checkbox"/> Farm waste minimisation                      |
| <input type="checkbox"/> PPG21 - not yet available   | <input type="checkbox"/> Mobile sheep dipping                         |
| <input type="checkbox"/> PPG22 - Road spills   | <input type="checkbox"/> Managing maize                               |
|  | <input type="checkbox"/> Understanding buffer strips                  |

To receive any of the above publications, enter the number required in the appropriate box and return this form to us by fax on 0118 953 5419

To receive the video packs below please call 0345 337700.

Pollution Prevention Pays (leaflet, poster and video free)

Building a Cleaner Future (booklet, poster and video £50 then £10 for further copies)

Name: \_\_\_\_\_

Address: \_\_\_\_\_

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## MANAGEMENT AND CONTACTS:

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This report covers the calendar year 1998 and records the pollution incidents occurring in England and Wales. It provides an analysis of substantiated pollution incidents by both source and type of pollutant and gives an indication of their environmental impact. The report also gives details of legal action taken in respect of these incidents and a commentary on how the Environment Agency manages pollution incidents, and pollution prevention initiatives are described.

£40

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