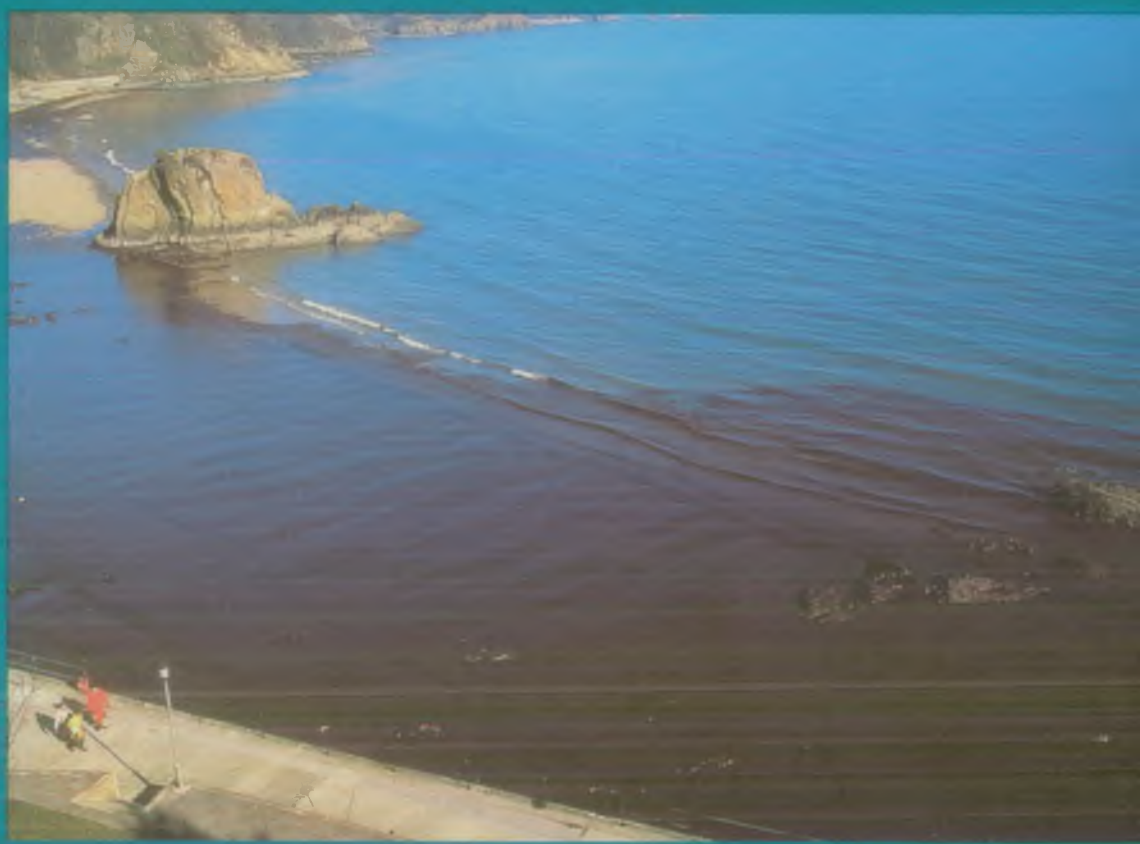
Water Pollution Incidents in England and Wales 1996



Environment Agency

EA: Water Quality - Box 5

Water Pollution Incidents in England and Wales 1996

Report of the Environment Agency

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Cover photograph:
Oil from the *Sea Empress* at Tenby North Beach.

Photo - Ed Bent

Executive Summary

The National Rivers Authority (NRA) and the Environment Agency (the Agency) responded to 32,409 reports of water pollution in 1996, of which 20,158 were subsequently substantiated. These figures show a decrease of 10% in the number of reports and 14% in the number of substantiated incidents. For the fourth consecutive year the number of the most harmful Category 1 (Major) incidents has fallen, from 199 in 1995 to 156 in 1996.

The continued reduction in Major incidents indicates the effectiveness of our efforts to promote pollution prevention. This is of particular note in the agricultural sector, with a fall from 239 in 1990 to 28 in 1996. The number of major oil pollution incidents has also fallen over the same period, from 87 to 29. Both farmers and oil users have been directly targeted by pollution prevention initiatives in recent years and although the dry summer of 1996 will have reduced the number of water pollution incidents, it is believed that the efforts of our staff in preventing pollution are now discernable. In response to the large number of incidents arising from the construction industry a new initiative to target the industry was launched by the Agency in 1997. Future trends will be carefully monitored. A number of major incidents involving road transport have highlighted this area again. Since first reported as a separate category in 1993, the number of transport related incidents has risen slowly but steadily, in contrast to the slight reductions in other categories, and now accounts for 10% of incidents.

Pollution incidents are categorised by both source and type of pollution. Of those categorised by source, the sewage and water industry accounted for the largest proportion (28%) of incidents. The construction industry was the most frequently identified source of industrial pollution for the third consecutive year, although the total number of incidents fell by 14%. Dairy farming was the largest source of agricultural pollution, whilst pollution from domestic and residential sources accounted for a significant number of incidents (see "other" category in Figure A).

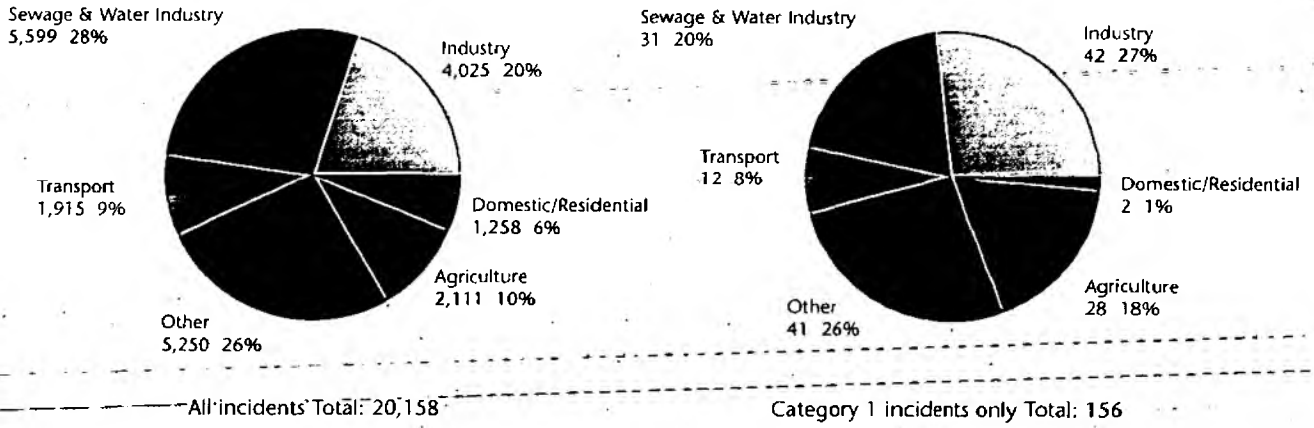


Figure A *Distribution of substantiated pollution incidents by source, 1996*

Meanwhile, of those categorised by type of pollutant, sewage accounted for 26% and oils and fuels for 28%. (see Figure B below). Inert suspended solids, although included in the "other" category in the report are shown separately and accounted for 7% of the total.

Cattle slurry was the most frequently identified organic waste with paints and dyes the most commonly recorded chemical pollutant. Diesel was the most commonly identified oil. However identifying oil which has been in a stream or drainage system for any length of time is difficult and in 21% of such incidents the oil type could not be established. A fall in the number of oil and fuels pollution incidents brings the total below 6,000 for the first time since 1991.

Prosecutions were brought for 139 incidents which occurred in 1996 and 135 polluters were successfully convicted. At the 1st January 1997 a further 91 cases relating to incidents in 1996 had yet to go before the courts.

The highest fine of £175,000 was imposed on Severn Trent Water for an incident first reported in June 1995. The River Elan (near Rhayader, mid Wales) had been polluted with approximately one and a half tonnes of ferric sulphate from their water treatment works. It is estimated that 35,000 fish died as a result.

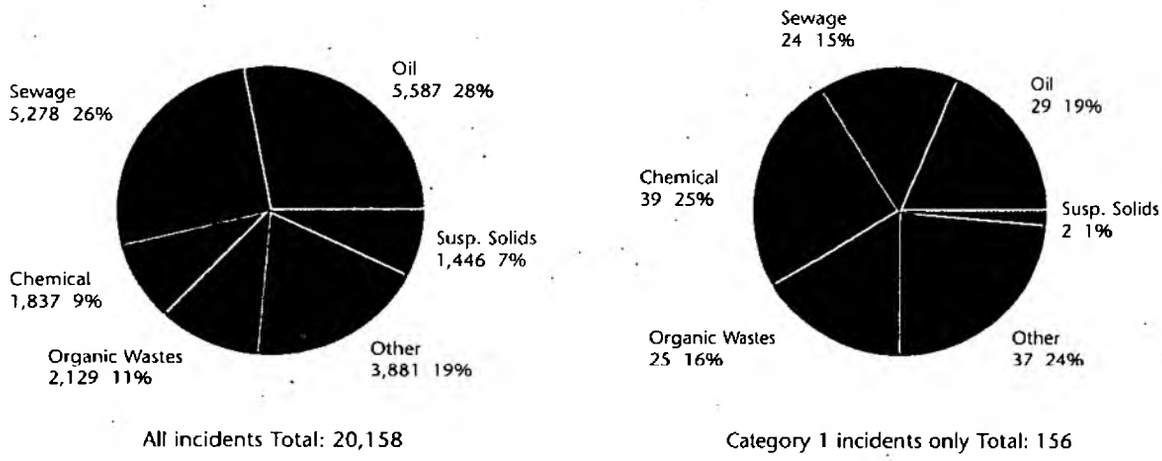


Figure B ***Distribution of substantiated pollution incidents by type, 1996***

Contents

1 Introduction

1.1 Background.

This report covers the calendar year 1996 and records the water pollution incidents occurring in England and Wales. It includes details for the last three months operation of the National Rivers Authority and the first 9 months of the Environment Agency. Throughout this transition period staff have continued to respond to complaints of water pollution and to deal promptly and effectively with such reports.

1.2 Definitions.

The NRA used a standard pollution incident classification system throughout its eight regions which was last modified in January 1995. The Environment Agency continues to use the same system, ensuring consistency in reporting through the transitional period. Appendix A gives details of the scheme. Different criteria for assessing incident severity, relating primarily to agricultural pollution, were in use prior to 1989, making comparison with earlier data difficult. Details of the earlier system for defining a 'serious' incident are also included for comparative purposes.

1.3 Current and future developments.

The Environment Agency has retained the NRA's highly successful emergency hotline (0800 80 70 60) system for reporting incidents. Its use increased through 1996 as a result of the wider responsibilities of the Agency, with calls relating to illegal waste tipping and air pollution in addition to those relating to water pollution. The number is manned 24 hours a day and received more than 53,700 calls in 1996, of which 17,492 related to water pollution.

The Environment Act 1995 which created the Environment Agency also introduced significant changes relating to pollution - in particular, powers to serve enforcement notices in respect of consented discharges or anti-pollution notices for other sources (under an extension of the powers available to the Agency under Section 161 of the Water Resources Act 1991). An enforcement notice can be served if the discharger is contravening or is likely to contravene a condition of a consent. A works notice can be served to prevent polluting matter entering a watercourse or to require polluters to take action to clean up pollution. The enforcement notice powers came into force on the 1st of January 1997; the anti-pollution works notice powers will take effect during 1997.

Consultation on further new regulations commenced in December 1996. Proposals for oil storage regulations have been brought forward by the Department of the Environment as a consequence of the continuing significance of oil pollution, which accounts for 28% of all incidents. The draft regulations are similar in concept to the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991. They aim to ensure that all newly installed oil storage tanks on industrial, commercial and institutional premises are of an adequate design and properly bunded. Alternatively, site specific pollution prevention measures, agreed between the Environment Agency and the site operator, may be adopted. Such controls could, in the long term, bring about an important reduction in the number of major and significant oil pollution incidents. It is estimated that the Environment Agency expends in excess of £1.4 million per year on the investigation and clean-up of oil pollution incidents.

2 Pollution Incident Management.

In this section we show by example the type of pollution incident Agency staff are called upon to deal with. The variety of incidents a pollution control officer may encounter is large. Each report must be treated as potentially serious until sufficient information has been obtained. In some cases this can be assessed by questioning the person reporting the pollution, but in most cases an immediate site visit is necessary. Our officers dealt with an average of 89 pollution reports every day in 1996, the majority of which were minor. However, even minor incidents need careful investigation and may often involve follow up pollution prevention visits. A Major incident may take days or even weeks to control and trace. If a prosecution is likely a significant amount of work will be required in gathering evidence, interviewing witnesses and preparing the case. Officers time and the cost of any remedial clean up work is recharged to the polluter. These costs will depend to a large extent on the severity of the pollution and can be considerable, as shown in Table 22.

2.1 Major Incidents

There were 156 Major incidents in England and Wales in 1996. Pollution control staff aim to arrive on site within 2 hours during office hours and 4 hours at other times. Their role is to confirm that pollution is occurring, to take any measures they can to minimise or eliminate the impact of the pollution, to warn river users who may be affected (for example fish farms or drinking water abstractions) to prevent further discharge and to collect evidence which may be used in any subsequent legal action.

A number of photographs relating to some of the following incidents are shown on pages 25 to 28

2.1.1 Sea Empress oil spill

The third largest oil spill in UK waters (after the Torrey Canyon and Braer spills) occurred when the tanker *Sea Empress* hit rocks when attempting to enter Milford Haven Waterway on the evening of the 15th February 1996. Approximately 72,000 tonnes of crude oil and 360 tonnes of fuel oil were lost from the vessel during the next six days. Large quantities of emulsified oil were subsequently washed up on beaches and coves along 200km of coastline.

This incident had a major impact on both the environment and the media and tested our ability to respond to such emergencies to the full. The overall management of the incident was coordinated through a Joint Response Centre (JRC), which was set up to provide a multi-agency response. This was supported internally by Area and Regional incident rooms. A large scale clean-up operation was instigated, with our in house workforce providing a valuable contribution. Support was also provided by staff from Southern Region for deployment of booms at environmentally sensitive sites. The JRC is still functioning on a reduced basis for coordination of remaining clean up activities, with the Agency providing input and advice on waste regulation and environmental issues.

In the initial stages of the incident, intensive water quality monitoring was carried out by our marine survey vessel Vigilance. This was in addition to toxicity and sediment monitoring both within and outside the Haven Waterway. Our Coastal Surveillance Centre in South Western Region also provided an aircraft for remote sensing purposes. Samples of salmonid fish were collected on behalf of the Welsh Office for tissue analysis by MAFF, in relation to fishery closure orders. Monitoring of hydrocarbon levels within the water column at bathing waters and within the Haven Waterway is continuing.

An independent committee, SEEEC (Sea Empress Environmental Evaluation Committee), has been set up under the chairmanship of Professor Ron Edwards, to assess the environmental impact of the Sea Empress oil spill . The Agency is represented on the three task groups looking at pollutant behaviour and marine and shoreline impacts, and is involved in the collation of monitoring data and research projects which include fisheries, benthic, phytoplankton, toxicity and amenity studies. The Agency is also carrying out a complex and comprehensive investigation with the Department of Transport, and in the light of evidence collected, will decide whether any prosecution would be in the public interest.

2.1.2 Sewage Treatment and Water

Electrical circuit failure

In August 1996 the failure of a printed circuit board in the inlet flow recorder at Anglian Water's Leighton Linslade Sewage Treatment Works caused the inlet to the works to close. Raw sewage flow was diverted to the works storm tanks, which had only 8 hours storage capacity. When the storm tanks were full, raw sewage was discharged straight to the river. The incident occurred on a Sunday, and the works was unmanned. The Agency received reports of dead fish in the River Ouzel later that

day. On investigation it was estimated that nearly 3 million litres of untreated sewage had been discharged and 4,000 fish killed. The Agency alerted Anglian Water Services who installed aerators on the river. Agency officers gave advice on the remedial work and deployed further aeration equipment. Without this action the fish kill could have been even more serious. The Agency took Anglian Water Services to court, where the Magistrates committed the case to Crown Court for sentencing, on the basis that a substantial fine was merited. The Crown Court subsequently imposed a fine of £7,500, considerably less than the £20,000 maximum in the Magistrates Court.

Yet again this emphasises the importance of improving automatic equipment and alarm systems at sewage treatment works and pumping stations, to ensure that they fail safe and prevent such incidents occurring.

Septic tank pollution

Not every sewage pollution involves a Major incident, but even small discharges can cause a significant workload. Following a report of pollution in 1995, an unconsented and poor quality discharge was found to be occurring from a septic tank serving the Pentney House Hotel at Narborough, King's Lynn in Norfolk. Despite several visits to the site and discussions with the hotel's owners no action was taken to improve matters. A formal caution was issued in 1995, in the hope that the owners would take heed and undertake corrective action. However, there was no improvement. A further unsatisfactory formal sample was taken in June 1996 and the owners were told to stop the discharge. When this request was ignored a further sample was taken and a prosecution was initiated. Following conviction the company obtained a discharge consent and installed a full sewage treatment plant, and conditions in the stream are now satisfactory.
If the incident above had occurred in 1997, an Enforcement Notice could have been used to ensure that the company carried out the necessary improvement works (See Section 1.3).

2.1.3 Industrial

Fire at paint factory

On the 5th August 1996 a major fire occurred at the premises of J W Bollom in South London. The company specialised in paint manufacture and occupied a site with a culverted stream, the Chaffinch Brook, running beneath it. Twenty fire engines attended, using an estimated 20,000,000 litres of water in fighting the fire. This water, along with paints, dyes and solvents from the factory, formed a highly polluting cocktail which drained into the brook. Environment Agency staff, with assistance from the fire service, built four dams across the channel to contain the contaminated water and arranged for its removal by tanker for treatment and disposal. As a result the damage to the brook was limited in extent and downstream fish stocks in the River Wandle were saved.

Food industry

In response to a report from a member of the public an Agency Pollution Control Officer inspected the Merlins Brook at Haroldston Bridge near Haverfordwest on August 17th 1996. The river was heavily discoloured with what appeared to be milk and distressed fish were seen. The bed of the stream was covered with white sewage fungus. This was traced to a four inch plastic pipe adjacent to a St Ivel factory, from which a significant quantity of a milky discharge was entering the river. Samples were taken and staff at the plant were contacted and began investigations to establish the cause of the pollution.

Pollution was eventually traced to a sump containing a valve which St Ivel operatives had failed to close. Under storm conditions this diverted storm surface water from the factory to the Merlins Brook but at all other times it should have been closed. At the same time a second valve on the effluent system which regulates flows to foul sewer had been only partially opened, restricting the flow and causing effluent to back up into the sump and then to the river. Once the two valves were reset the discharge ceased.

Upon analysis the effluent was found to be twice as polluting as domestic sewage. A follow up fisheries survey found a total of 160 trout and migratory trout and 23 salmon corpses as well as large numbers of other fish species. The company were fined a total of £2,400 when the case was brought to court.

The incident clearly demonstrates the importance of staff training, clear procedures and monitoring of off-site discharges. It also highlights the highly polluting nature of many foodstuffs, a fact which many companies are not aware of.

Silt from tunnelling operation

In May 1996 a report was received of pollution of the Lumb Brook and River Medlock at Droylesden, Manchester. On investigation of the report the Lumb Brook was found to be badly silted and muddy. The source was a discharge from a construction site operated by Kennedy Construction Ltd. where a new drain for the M66 was being laid in a tunnel dug by remote controlled machinery.

Slurry produced in the process was passed through a separator to remove solids and the water re-used until too dirty, when it was passed to a settlement lagoon. However, it was evident that some slurry had overflowed and passed into the Lumb Brook. The company were prosecuted as a consequence and fined £12,000. Silt pollution is a common problem from construction sites and it is vital that project plans include adequate provision to contain and control any discharges. In this case the company had under-estimated the quantity of water to be dealt with and the difficulty of settling the solids. They also failed to notify the Agency when they became aware of the problem.

Chemical storage

Just one week after its formation, Midlands Region staff responded to the first Category 1 pollution incident dealt with anywhere by the Agency. The incident involved a leakage of 10 tonnes of concentrated sulphuric acid from an unbunded storage tank at the premises of M&N Steel Processing Ltd, Cradley Heath, West Midlands. It was spotted by a night security guard in the early hours of Easter Sunday. On investigation it was found that leaking acid had entered the site's surface water drainage system and then the River Stour, killing thousands of stickleback and minnow in the urban watercourse. Samples from the river exhibited a pH of 2.1 and it was calculated that even the River Severn would not provide sufficient dilution to render the pollution plug harmless to fish. Consequently, a large scale remedial operation was initiated to dose the river with lime in order to neutralise the acid. Obtaining several tonnes of powdered limestone on Easter Sunday was no easy task but thanks to a local farmer, Severn Trent Water Ltd and the fire service, three and a half tonnes were delivered to a downstream site. The dosing operation proved completely successful with the pH of the River Stour being restored to normal by 01:00 the following day. In the meantime Severn Trent Water Ltd had coordinated the containment and disposal of the remaining on-site acid.

The incident involved many of the Agency's functions including water quality, water resources, fisheries, the in-house work force and waste regulation. Staff had to liaise with the fire service (225 firefighters and 50 appliances), Severn Trent Water Ltd., Environmental Health Officers and British Gas (acid was threatening an adjacent gas main). The pollution resulted in the Company and its Managing Director being prosecuted by the Agency, with fines of £4000 and £1000 respectively, being imposed by local magistrates. Costs in dealing with the incident totalled £32,400 comprising Agency costs of £2,400; Severn Trent Water Ltd costs of £10,000; and Fire Service costs of £20,000.

2.1.4 Transport

Chemical and diesel tankers

On a freezing February morning a tanker carrying 20 tonnes of nitrobenzene crossed the central reservation of the A19 and collided with a tanker loaded with diesel fuel. The tractor units caught fire and were destroyed, leaving the two tanker units on their sides on the south bound carriageway. An estimated nine tonnes of nitrobenzene spilled onto the road and entered the drainage system, discharging into the Stainsby Beck. Nitrobenzene is heavier than water and collected in pools in the bed of the stream. There was a risk that the chemical would migrate through fractures in the underlying rock and into the major aquifer beneath. Nitrobenzene is highly toxic and could have been a serious threat to drinking water supplies The beck was dammed, drained and the bed excavated in areas where nitrobenzene was found. It took four days to clear the road and a month to decontaminate the drainage system and beck. More than 100 tonnes of earth from the road embankment, 2,000 tonnes of soil from the vicinity of the beck, and 1,000 tonnes of liquor were removed from the site. The Agency recovered costs of £142,000 for clean-up work associated with the spillage. The total cost of the incident was in excess of £500,000.

Empty lorry

Even a lorry with no load can pose a significant pollution threat, due to the large quantity of fuel it can carry. In February an empty lorry travelling South on the A1 at Berwick on Tweed crashed through the parapet of the bridge over the River Tweed and landed on its side in the river. Fortunately the driver was uninjured. A difficult recovery operation began and the Agency's in-house work force installed a boom to prevent the fuel leaking from the lorry and spreading downstream. The Tweed at Berwick is home to several hundred mute swans and other wildfowl. The local wildfowl trust was notified and arrangements were made to feed the swans in order to draw them away from the path of the oil. Due to the tidal effects on this part of the river it was not possible to move the lorry until the following morning.

2.1.5 Other Incidents

Mine water

A dramatic breakout of mine water occurred in February 1996 in the picturesque village of Holmfirth, Yorkshire, where the popular television series, 'Last of the Summer Wine' is filmed. Under normal conditions mine water contaminated with dissolved metals (from extensive mineworkings

abandoned in the late 1940's) flows into New Mill Dike at Jackson Bridge. This causes the bed of the Dike to be blanketed by ochreous deposits down to its confluence with the River Holme, a distance of 3.5 km. The breakout in 1996 is believed to have occurred when ochre deposits within the mine were suddenly flushed out, possibly due to the sudden clearing of a blockage. When this happens the flow increases and there is a general scouring out of ochreous deposits from the mine. In this case the discharge caused local flooding and the New Mill Dike and Rivers Holme and Colne to turn red for a distance of about 15 km due to the ochreous solids.

The Coal Authority has attempted to maintain the pipe which carries the minewater from the mine under normal conditions, although this will not result in any water quality improvements. However the minewater discharge is included in the Abandoned Minewater National and Regional Ranking Lists at 26 and 16 respectively.

Landspreading of wastes

Early in January 1996 a member of the public contacted the NRA expressing concern over the amount of waste being spread on fields near Charlton Hawthorne, Wincanton in Somerset. An inspection revealed a mixture of waste milk and whey running into a tributary of the River Cale from a waste spreading operation. The stream was discoloured, frothy and smelled obnoxious. A formal sample was taken and the operator was told to stop operations in order to prevent further pollution. At a follow-up site meeting with waste regulation staff the next day the stream was found to be contaminated with blood. Abattoir waste which should have been injected into the soil, rather than spread, had run across the field into the stream. About 1km of watercourse was severely affected. Further samples were collected and the company, Dawe (Sludge Injection) Ltd, were eventually convicted of causing pollution and fined £2,000. This type of waste disposal operation is exempt from normal waste regulation controls, but does have the potential to cause serious pollution if not properly managed. The company involved have now stopped their disposal operations.

Natural incidents

Occasionally incidents which are reported to the Agency are not due to pollution but to natural events. Low dissolved oxygen and low flows can have a serious effect on water bodies. In 1996 there were 12 such incidents which were sufficiently severe to be classified as Major. In March and April 1996 lack of rainfall caused extremely low flows in the River Gipping in Anglian Region. The river level dropped below gates serving a mill pond and millrace at Needham Market. The low flow and high nutrient levels in the pond caused a bloom of diatoms, which in turn caused low dissolved oxygen levels in the water. Approximately 1,000 roach, chubb and pike were killed. Decomposing fish exacerbated the low oxygen situation and fish continued to die for a few days after the initial incident. Flows to the pond and water levels in the river were subsequently improved by altering upstream flow controls. This demonstrates the vulnerability of some watercourses to damage as a result of natural events and the importance of active river management to minimise such effects.

3 Pollution Prevention

3.1 Building a cleaner future

The work of preventing pollution has continued through the transition to the Environment Agency, building on the foundations laid by the NRA. The Agency has continued to engage in dialogue with other organisations and is actively seeking opportunities to co-operate to prevent pollution.

The Agency has been concerned over the number of pollution incidents attributable to the construction industry in recent years. The industry has been responsible for a large number of pollution incidents and the Agency anticipated an increase as the industry recovered from recession. It was decided that the Agency would work with the industry to prevent pollution through an educational programme. This is aimed at raising awareness within the industry about environmental issues. The first major step was a research and development project to produce a training video for construction workers in 1996. The project was jointly funded by the Environment Agency and the BOC Foundation for the Environment. A steering group of construction industry representatives was formed and managed by the Construction Industry Research and Information Association (CIRIA), providing valuable advice on both the audience and the content of the video. Filming was undertaken on a number of sites with further assistance from a number of construction companies and their clients. The resulting video is intended for use in employee and sub-contractor training sessions and aims to identify how pollution can occur on construction sites and how it can be avoided.

The video was publicly launched on the 4th November 1996. At this launch the Agency's Chief Executive, Ed Gallagher, emphasised that, although the production of the video was an important step in helping the construction industry to reduce its environmental impact, there would need to be a range of other initiatives to provide relevant advice and information to those working in the industry, from project design, through construction, to operation.

A number of related initiatives are already underway, from the updating of existing pollution prevention guidance notes by the Agency to site handbooks on waste minimisation and recycling from CIRIA. Only by working with the construction industry can we hope to effectively minimise pollution risks from its activities and move towards a more sustainable approach.

3.2 Other Initiatives

3.2.1 The Oil Care Campaign

The Agency has continued to work with the oil industry on the Oil Care Campaign in 1996. The campaign aims to inform users of fuels and oils about the risks of pollution and how it can be avoided. Oil companies have continued to provide advice to their customers both directly, using Environment Agency materials, or through related publicity. For example Shell Oils have developed and marketed a 'spill kit' for their customers. This spill kit provides sufficient materials to contain a small spill or block a drain, a range of related advice on its use and helpful contact information.

Significant progress has been made in the labelling of lubricating oil for the DIY car maintenance market, with the majority of companies now including the Oil Bank Line number in the environmental information section. This is reflected in calls to the Oil Bank Line, the majority of which are now made as a result of the purchaser reading the number on packaging. Over 2,000 calls were made to the line in 1996. The industry has also provided financial support for the line, with contributions from Gulf, Total, BP, Mobil, ESSO and the British Lubricants Federation having covered the cost of running the service in 1996/7.

An Agency R&D project, managed on its behalf by CIRIA, to provide guidance on the construction of bunds for oil storage tanks was completed in 1996. The project report "Construction of Bunds for Oil Storage Tanks" is published by CIRIA (ISBN-0-86017-468-9), price £18. It provides detailed specifications and drawings for bund construction in reinforced concrete and masonry, along with guidance on the size of such bunds which takes into account rainfall for the first time. Extracts providing specifications and drawings for the most commonly encountered sizes of bunds have been published separately and are available, free, from both CIRIA and the Agency.

In an effort to encourage and increase the availability of oil banks, guidance on the pollution prevention measures appropriate for them has been drafted, and a low cost installation (which minimises surface water run-off) has been installed on a trial basis in Wiltshire.

3.2.2 Agriculture

Pollution prevention activities in agriculture have continued as an important part of the Agency's work. A number of joint initiatives were undertaken in 1996. These included collaborative research with the National Farmers' Union (NFU) at selected farms on minimising farm waste. This research aims to demonstrate to farmers that there are sound business reasons for minimising waste production. Cost savings can be made whilst providing environmental benefits and improving their market base. Farm Waste Minimisation is to be promoted at agricultural shows in 1997 and a leaflet providing helpful advice is in preparation.

A project to raise awareness of the environmental problems associated with maize growing involved the Agency with the Maize Growers Association and MAFF. This has culminated in a booklet explaining best management practices which aims to prevent soil erosion and pesticide pollution due to maize cultivation.

A third example of collaborative work involved the Agency and MAFF in identifying ways in which advice and guidance can be delivered to farmers to reduce diffuse pollution. The topics covered include improved nutrient management and soil erosion control. Delivery of such advice will include demonstration farms.

3.2.3 Pollution Risk Assessment

Following a Major diesel spillage in 1995, which resulted in a significant pollution of the rivers Lowman and Exe in North Devon and the closure of one of South West Water Services major drinking water supplies serving Exeter, a programme of joint pollution risk assessments was drawn up with the active participation of South West Water.

The diesel spill was found to have originated from an engineering company in Tiverton, raising concerns that further potential major incidents threatened the river system in this area. Pollution prevention activity was therefore focused on industrial and commercial premises in the town.

In 1996 a total of 70 individual premises were notified of our intention to carry out site visits. This was extremely effective in reducing any negative response to unannounced visits and also gave the site occupiers time to consider and address issues of concern. The visits were carried out between January and March 1996. Information collected included site contact names and telephone numbers (for emergencies), lists and quantities of chemicals and fuels held on site, and details of storage arrangements. Details of checks on surface water drainage and sewerage systems were also recorded. The Agency's Pollution Prevention Guidance Notes and associated literature were made available to all sites visited.

From this one exercise 80 out of 96 fuel storage tanks surveyed and 31 out of 38 chemical storage systems were found to be unsatisfactory. Of 23 vehicle wash areas 15 were found to be unsatisfactory, with several discharging to the surface water system illegally. In all nearly three quarters of the sites visited were found to have a high risk of causing pollution, with substantial quantities of potentially polluting chemicals stored unsatisfactorily.

Many of the site operators or owners took a positive view of the advice they were given and a number of improvement programmes aimed at reducing the risk of an incident were initiated. Re-visits to problem sites are under way to ensure that our message has not been forgotten.

These findings are typical of many industrial estates. They emphasise the need for the Agency to undertake such campaigns, to work with small to medium sized companies to improve their understanding of how pollution occurs and what can be done to minimise the risks.

3.2.4 Liaison with the Fire Services

The role of the fire services in managing, controlling and minimising major incidents and their impacts was the subject of a Memorandum of Understanding between the NRA and CACFOA (Chief & Assistant Chief Fire Officers Association) in 1993. The memorandum is currently being revised to bring it up to date. However, significant progress in providing both equipment and training to the fire services has continued. "Grab packs" containing absorbent and sealing materials are carried on many fire engines now and an increasing number of brigades have also received more specialist equipment such as drain blockers, pumps, and collapsible storage tanks for use on back-up tenders.

One major initiative in 1996 was the provision of specialist equipment and a special one week course to the Fire Training College at Moreton-in-Marsh. The course presented by Agency staff was designed to familiarise trainers at the college with the need for pollution control and in the operation of the equipment provided.

3.2.5 Sewage Pollution

With over 26% of all pollution incidents being sewage related the management of, and investment in, sewage infrastructure continues to be of vital interest to the Agency. The water industry invest-

ment programme for the period 1995-2005 (Asset Management Plan 2) included an element of discretionary expenditure to deal with unsatisfactory storm sewer discharges and other related problems. The Agency is working closely with the Water Service PLC's (WSPLC's) to identify where this is best spent. It is also monitoring progress.

3.2.6 Publications

Considerable efforts were made in 1996 to revise and update existing guidance to incorporate information on the Environment Agency and to broaden their scope, where appropriate, to reflect the Agency's wider responsibilities. Five pollution prevention guidance notes were re-issued and one new note, (on "Dewatering of underground ducts and chambers" (PPG20)) was published. Work on revising the remainder is well advanced. Leaflets relating to the 'Oil Care' and 'Pollution Prevention Pays' campaigns were revised, and new materials relating to the 'Building a Cleaner Future' video produced. A new series of leaflets on avoiding pollution is in preparation, replacing former NRA publications. The first two "River Pollution and how to avoid it" and "Silt pollution and how to avoid it" were completed in December 1996. A full list of pollution prevention publications is given in Appendix C, along with details of how they may be obtained.

3.2.7 River Dee Water Protection Zone

An application was made by the NRA for the designation of the River Dee as a Water Protection Zone (WPZ) under the provisions of S93 of the Water Resources Act, 1991. This followed a number of serious incidents which had affected water supplies for over 2 million people. Such designation would give the Agency significantly greater powers to prevent pollution within the Dee catchment. Although the Secretaries of State have indicated their intention to approve the application, the formal decision has yet to be announced.

3.2.8 Pollution Prevention Initiatives within the Agency

A National Audit Office Report on the NRA in 1995 identified the need for good pollution prevention and pollution incident information. A new pollution prevention database was developed and came into use in Thames Region in 1996. Work on introducing the system into other regions is in progress. The system is sufficiently flexible to be used on any site, and has been adapted to include information relating to waste management and Integrated Pollution Control where appropriate.

The work of auditing our own sites, started by the NRA has continued. Sites are assessed by in-house auditors who identify any unacceptable risks and the measures needed to control them.

3.2.9 Groundwater Protection

The role of the NRA National Groundwater Centre, transferred to the Agency, was redefined in 1996. Approval for an expanded National Centre, incorporating all technical aspects relating to groundwater management and its protection, together with contaminated land management and remediation, was finally agreed in February 1997. The Centre is based in the Midlands Region at Solihull. It will act as a focus for best practice and technical advice for the Agency's own staff, other regulatory bodies (such as local authorities), and industry in general.

A study giving an overview of the extent and nature of groundwater contamination from point sources in England and Wales, reported in April 1996 and has now been published by the Agency. See References for details. The data has only been collected from Agency staff and is therefore incomplete, but it is the most comprehensive study of its type so far in England and Wales. Although pollution incidents relating to landfill activities are identified as the most numerous, incidents relating to chlorinated solvents, oils, hydrocarbons and other non-aqueous phase contaminants were found to be more severe in their impact. The clean-up of groundwater polluted with these immiscible substances is very difficult and costly. Consequently, through its National Centre, the Agency is studying closely the different means of achieving remediation, and of deriving methodologies which allow it to set realistic targets for cleaned-up water.

The programme of producing groundwater vulnerability maps continues, with a further 12 maps published in 1996, bringing the number available to 33 out of a planned total of 53.

3.2.10 Education

One of the key areas in which the Agency has identified a role different from its predecessors is in education. This is reflected in the creation of the post of Head of Education with the role of developing a broad educational strategy, encompassing the formal education sector (schools, colleges and universities) and further education. In 1996 the Agency produced 'The Living Water', a video and teachers notes on rivers and organic pollution for Key Stages 2 and 3 of the National Curriculum. The video pack is available free to teachers, see the publications list for details.

3.2.11 Highways Related Pollution

The growth in pollution related to the transport industry has been a feature in recent years. Road traffic accidents account for the largest proportion of transport incidents. The quality of run-off from roads and the design of drainage systems has also come under increasing scrutiny. A joint liaison document between the Highways Agency and the NRA was signed early in 1996 and will form the basis for consultation on new routes and the maintenance of existing highways. A number of joint research initiatives are under-way looking at existing maintenance procedures, at the quality of road run-off and at the effect on this of different treatment systems.

3.2.12 Best Management Practices

Surface water discharged from urban areas can have a severe impact on water quality due to its poor quality and the rapid run-off from conventional hard surfaces. The use of a range of alternative drainage strategies, known as Best Management Practices (BMPs), was pioneered in Sweden and the United States of America and introduced into the UK by the River Purification Boards in Scotland. A video promoting BMPs and aimed at developers and planners, 'Nature's Way', was launched in 1996. This was a collaborative project involving the Scottish Environmental Protection Agency (SEPA), the International Association on Water Quality and the Environment Agency. A number of potential sites are under investigation with a view to establishing projects which demonstrate the potential for such systems.

4 Analysis of Incidents

4.1 Introduction

The way water pollution incidents in England and Wales were reported was changed significantly in 1992, when incidents were classified both by the type of pollutant and by their source for the first time. This means that we now have four years of consistent data for analysis. Over this four year period, there have been few changes in the most significant source and types of incidents. The most obvious changes have been the increasing number of transport related incidents and the decrease in those from agricultural sources.

The majority of pollution incident investigations follow a report from a member of the public (although the number of calls from the fire services have increased in recent years). Because of this, the types of pollution reported are predominantly those which have 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 not likely to be reported. For a report to be made it is also necessary for the person seeing the pollution 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 do see pollution and will do nothing. It is therefore probable that this report underestimates the extent of episodic pollution in England and Wales. The number of pollution incidents reported by the public grew with the introduction of the NRA's Emergency Hotline Number (0800 80 70 60) in 1993. The Environment Agency has continued to use this number for the reporting of pollution, flooding, risk to wildlife, poaching, and the illegal dumping of hazardous waste.

The great diversity in polluting materials, and the nature of pollution incidents, mean that assessing the severity of an incident is not always straightforward. Delays in incident reporting by the public, or finding that the polluting discharge has stopped prior to the arrival of Agency staff, may make incident substantiation very difficult or impossible. It is important that the public report 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 identify the cause and even where information is available there are often a number of contributing factors.

4.2 All reported incidents

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

During the calendar year of 1996, a total of 32,409 pollution incidents were reported to the NRA and it's successor the Environment Agency, a decrease of 10% compared to 1995. Each report was investigated and every effort made to substantiate and identify the cause and nature of the incident. In 1996 20,158 incidents (62% of those reported) were substantiated, that is, evidence was found that a pollution incident had occurred. Of these substantiated incidents 156 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 1987 to 1996 in England and Wales. Unless otherwise stated the remainder of the report is based on substantiated incidents only.

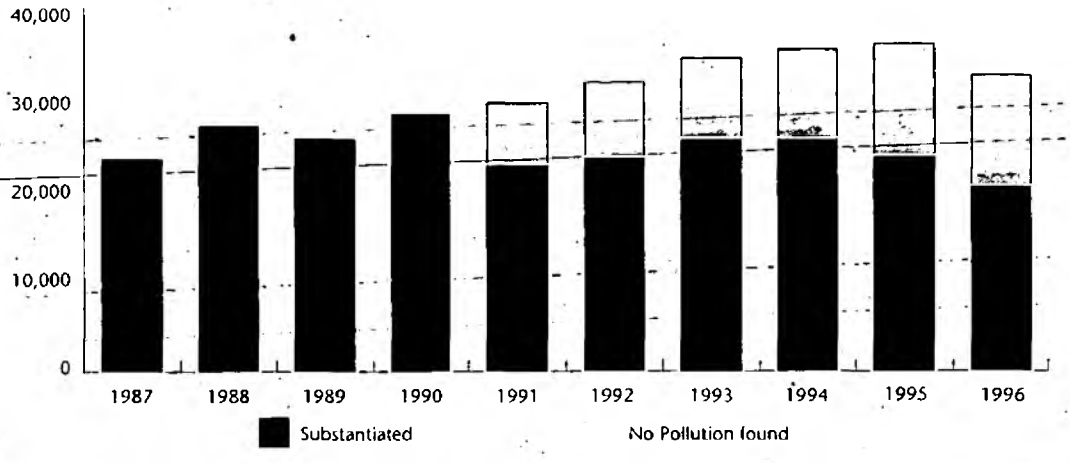


Figure 1
Total number of reported pollution incidents in England and Wales, 1987-1996

4.3 Regional distribution

Midlands Region had the most substantiated incidents (21% of the total) and Southern Region the least (6%). Regional variations in the number of incidents reflect the varied geography, density of population and industry across England and Wales. The number of incidents fell compared with 1995 in all but the Anglian and Midlands Regions, where the number of incidents rose slightly.

Table 1 shows a regional breakdown by incident category and includes figures for unsubstantiated incidents.

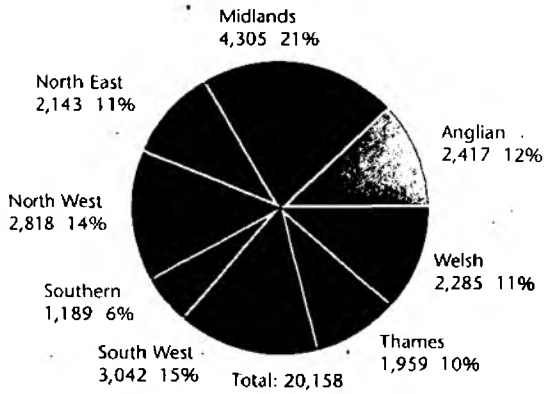


Figure 2
Total number of substantiated pollution incidents by Agency Region, 1996

4.4 Distribution by source of pollution

Pollution sources (Figure 3a and Table 2) are the premises from which the pollution arose. They are assigned to five basic categories: agriculture, industrial, sewage and water industry, transport and "other" sources. "Other" sources include pollution from hospitals, domestic and residential properties

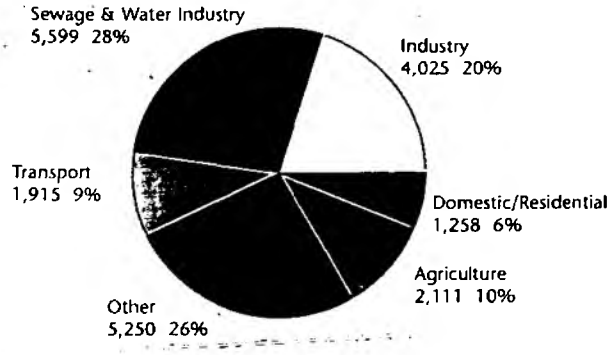
Table 1
Total number of reported pollution incidents (1996) by incident category

Region	Substantiated			Total substantiated	Category 4 unsubstantiated
	Category 1	Category 2	Category 3		
Anglian	31	230	2,156	2,417	901
Midlands	25	218	4,062	4,305	1,648
North East	18	222	1,903	2,143	1,917
North West	27	280	2,511	2,818	1,182
Southern	15	63	1,111	1,189	1,318
South West	18	234	2,790	3,042	2,231
Thames	9	136	1,814	1,959	1,823
Welsh	13	127	2,145	2,285	1,231
TOTAL	**156**	**1,510**	**18,492**	**20,158**	**12,251**

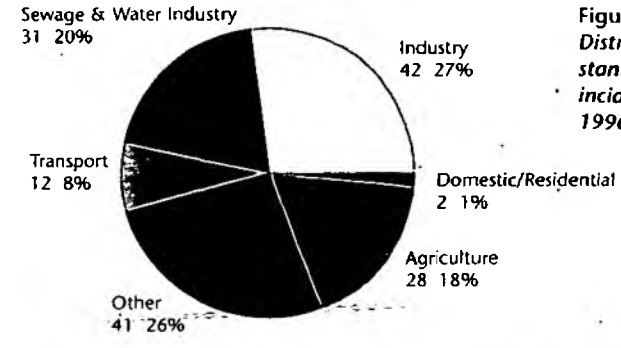
Table 2
Total number of substantiated pollution incidents (1996), by source

Region	Agriculture	Industrial	Sewage & Water	Transport	Other Source *	Total	Percentage Of Total Incidents
Anglian	200	405	461	361	990	2,417	12%
Midlands	410	833	1,219	450	1,393	4,305	21%
North East	166	424	722	167	664	2,143	11%
North West	275	648	801	158	936	2,818	14%
Southern	95	212	298	152	432	1,189	6%
South West	583	504	889	253	813	3,042	15%
Thames	93	372	471	201	822	1,959	10%
Welsh	289	627	738	173	458	2,285	11%
TOTAL	**2,111**	**4,025**	**5,599**	**1,915**	**6,508**	**20,158**	
Percentage of total incidents	10%	20%	28%	10%	32%		

** Includes domestic and residential sources, shown separately in Figure 3*

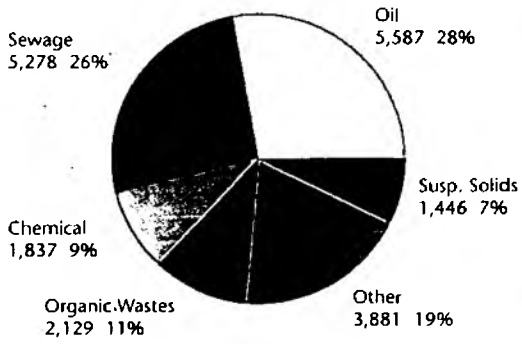


All incidents Total: 20,158

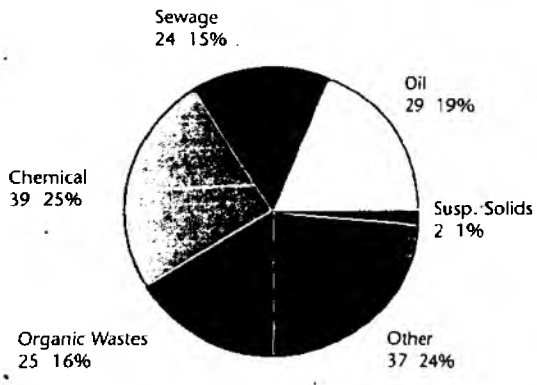


Category 1 incidents only Total: 156

Figures 3a and 3b *Distribution of substantiated pollution incidents by source, 1996*



All incidents Total: 20,158



Category 1 incidents only Total: 156

Figures 4a and 4b *Distribution of substantiated pollution incidents by type, 1996*

and crown exempt sites, and those incidents where the source was not traced. The largest identified "other" source was domestic and residential premises which accounted for 6% of all incidents and are therefore shown separately in Figure 3a.

The greatest proportion of incidents arose from "Other" premises (32%) and from the Sewage and Water Industry (28%).

4.5 Distribution by type of pollutant

Pollutant types were also split into five categories: fuels and oils, sewage, chemicals, organic wastes and "other" types. The "other" types category includes those pollutant types which do not fit into the other four categories, for example, inert suspended solids, vehicle washings, natural causes, litter and those incidents where the pollutant was not identified.

The largest number of pollution incidents by type were fuels and oils (28%), followed by sewage and "other" (26% each). Natural causes (in the "other" types category) accounted for 4% of all incidents as in 1995. This is typical of long dry summers when low flows, low dissolved oxygen and algal blooms are more common. Inert suspended solids accounted for most incidents in the "other" types category - 7% of the total number of substantiated incidents - and are therefore shown separately in Figures 4a and 4b. The regional breakdown of pollutant types is shown in Table 3.

4.6 Category 1 incidents

Only 156 incidents (less than 1%) of the total of 20,158 were classified as Category 1 (Major). This compares to a figure of 386 in 1991. The categorisation of incidents has greatly improved since then which probably accounts for part of this decrease. However the Agency and its predecessors have worked hard to increase the environmental awareness of the public and industry, and this effort is now paying off.

Tables 4 and 5 show the number of Category 1 incidents in 1995 and 1996 by source and type. Figure 3b shows the proportion of Category 1 incidents from the five sources. "Other" and industrial sources caused the largest number of Category 1 incidents at 28% and 26% respectively. The largest numbers of Category 1 incidents by type were due to chemicals and "other" types (both 25%). The large number of Category 1 "other" types and sources is due largely to natural events (particularly in Anglian Region), where the hot dry summer caused algal blooms and low dissolved oxygen, both leading to significant fish kills.

There were two Category 1 incidents in 1996 which did not result in pollution, due to the efforts of the Agency and the emergency services. For example a spill of hydrochloric acid from a road tanker in Southern Region was neutralised with calcium carbonate, preventing any harm to the receiving water.

Table 3
Total number of substantiated pollution incidents (1996), by type of pollutant

Region	Organic Wastes	Fuels & Oils	Sewage	Chemicals	Other Types *	Total	Percentage Of Total Incidents
Anglian	189	763	555	239	671	2,417	12%
Midlands	436	1,258	991	446	1,174	4,305	21%
North East	150	562	761	199	471	2,143	11%
North West	341	588	843	308	738	2,818	14%
Southern	66	443	346	102	232	1,189	6%
South West	549	768	666	193	866	3,042	15%
Thames	86	817	428	153	475	1,959	10%
Welsh	312	388	688	197	700	2,285	11%
TOTAL	**2,129**	**5,587**	**5,278**	**1,837**	**5,327**	**20,158**	
Percentage of total incidents	11%	28%	26%	9%	26%		

** Includes suspended solids type incidents, shown separately in Figure 4*

Table 4
Total number of Category 1(Major) substantiated pollution incidents (1995 and 1996), by source

Region	Agriculture		Industrial		Sewage & Water		Transport		Other Sources		Total		Percentage	
	95	96	95	96	95	96	95	96	95	96	95	96	95	96
Anglian	1	2	5	4	7	6	0	2	2	17	15	31	8%	20%
Midlands	2	7	10	6	6	4	4	3	6	5	28	25	14%	16%
North East	7	0	13	8	10	5	2	2	4	3	36	18	18%	12%
North West	6	8	10	6	7	4	1	0	4	9	28	27	14%	17%
Southern	3	2	6	4	1	7	1	2	1	0	12	15	6%	10%
South West	6	6	8	5	7	1	1	1	13	5	35	18	18%	12%
Thames	0	1	2	3	6	1	2	0	2	4	12	9	6%	6%
Welsh	7	2	8	6	4	3	5	2	9	0	33	13	16%	8%
TOTAL	32	28	62	42	48	31	16	12	41	43	199	156		
Percentage	16%	18%	31%	26%	24%	20%	8%	8%	21%	28%				

Table 5
Total number of category 1 (Major) substantiated pollution incidents (1995 and 1996), by pollutant type

Region	Organic Waste		Fuels & Oils		Sewage		Chemicals		Other Types		Total		Percentage	
	95	96	95	96	95	96	95	96	95	96	95	96	95	96
Anglian	1	0	3	4	3	4	7	5	1	18	15	31	8%	20%
Midlands	1	6	8	3	5	4	8	8	6	4	28	25	14%	16%
North East	5	1	10	6	11	5	6	4	4	2	36	18	18%	12%
North West	7	6	7	5	6	4	5	7	3	5	28	27	14%	17%
Southern	3	1	3	4	1	5	4	3	1	2	12	15	6%	10%
South West	4	8	7	1	4	1	7	5	13	3	35	18	18%	12%
Thames	0	0	2	1	4	0	5	4	1	4	12	9	6%	6%
Welsh	7	3	5	5	3	1	6	3	12	1	33	13	16%	8%
TOTAL	28	25	45	29	37	24	48	39	41	39	199	156		
Percentage	14%	16%	22%	19%	18%	15%	24%	25%	21%	25%				

5 ANALYSIS OF INCIDENTS BY SOURCE

5.1 Agricultural pollution incidents

5.1.1 Total incidents

In 1996 a total of 2,111 substantiated pollution incidents arose from agricultural sources, accounting for 10% of all incidents.

5.1.2 Sources of agricultural pollution

The distribution of agricultural incidents by source is shown in Figure 5. As in previous years, the largest number came from dairy farming (47%), followed by beef farming (11%) and sheep farming (8%).

5.1.3 Agricultural fuel oil incidents

A significant source of pollution not included in Figure 5 is agricultural fuel oil incidents. The storage of fuel oil on farms is subject to specific regulations, The Control of Pollution (Silage, Slurry, and Agricultural Fuel Oil) Regulations 1991. The number of agricultural oil pollution incidents fell slightly, from 174 in 1995 to 166 in 1996.

5.1.4 Historical trends

Table 6 also shows the number of pollution incidents in each region from 1990 to 1996. The figure of 2,111 agricultural pollution incidents is the lowest recorded and represents a 29% reduction since 1991. The proportion of pollution incidents arising from agricultural sources declined from 12% in 1995 to 10% in 1996.
Midlands was the only region to record more agricultural incidents than in 1995. The most notable reduction in incidents was observed in South West Region, where there were 40% less than in 1995, although the number of Category 1 incidents in the Region remained unchanged.

5.1.5 Category 1 incidents

The number of Category 1 agricultural incidents has been declining since records began in 1991 when 99 were recorded, and dropped still further in 1996 to a total of 28.

A breakdown of Category 1 incidents is shown in Figure 6. The largest number of Category 1 incidents came from dairy farms (57%), followed by arable (18%) and beef farms(11%).

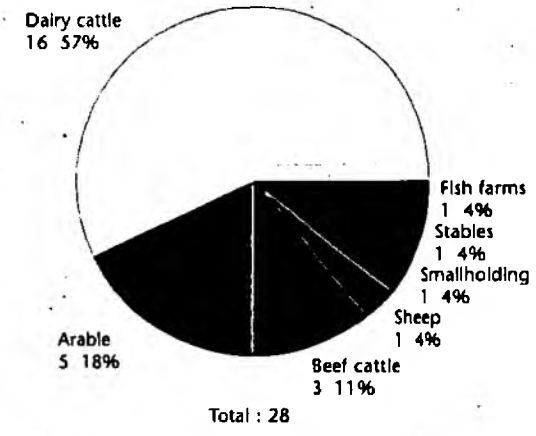


Figure 6 ***Substantiated Category 1 agricultural pollution incidents by source, 1996***

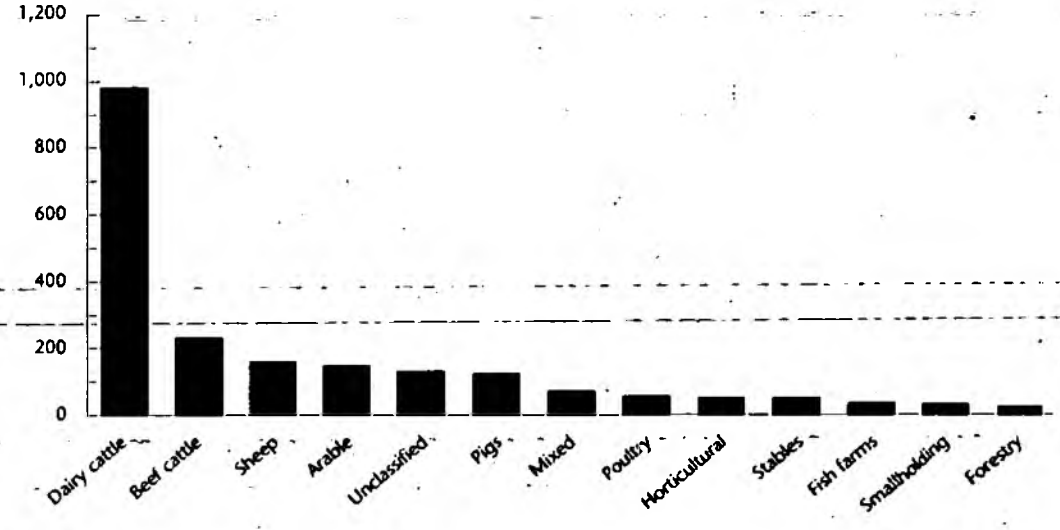


Figure 5 ***Substantiated agricultural pollution incidents by source, 1996***

Table 6
Total reported agricultural pollution incidents (1990) and substantiated incidents (1991-1996), by Region

Region	1990		1991		1992		1993		1994		1995		1996	
	R	S	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1	Sub	Cat 1
Anglian	179		212	3	283	3	356	0	326	1	212	1	200	2
Midlands	271	46	402	27	320	17	391	15	409	8	371	2	410	7
North East	370	45	343	22	231	6	148	7	396	5	220	7	166	0
North West	630	140	469	10	417	10	403	11	403	8	312	6	275	8
Southern	84	12	93	3	71	1	68	0	126	2	123	3	95	2
South West	1,008	222	936	28	911	20	943	24	1,025	9	975	6	583	6
Thames	58	9	78	2	91	0	132	2	100	1	115	0	93	1
Welsh	547	134	421	4	446	10	442	4	544	2	392	7	289	2
TOTAL	**3,147**	**608**	**2,954**	**99**	**2,770**	**67**	**2,883**	**63**	**3,329**	**36**	**2,720**	**32**	**2,111**	**28**

R = Reported
S = Serious
Cat 1= NRA and Environment Agency Category 1
Sub = Substantiated

5.2 Industrial pollution incidents

5.2.1 Total incidents

A total of 4,025 pollution incidents from industrial sources were substantiated in 1996, 20% of the total.

5.2.2 Sources of industrial pollution

Figure 7 shows the main sources of industrial pollution incidents in 1996. Of these incidents, 19% could not be classified into the main sources and were placed in the "other" category. This compares with 30% of incidents in 1995 and 47% in 1994, illustrating our ongoing improvements in the recording of incident data. As in previous years the construction industry was the most frequent polluter, contributing 13% of industrial incidents. The NRA took steps to reduce the number of pollution incidents from this source by initiating the production of 'Building a Cleaner Future' - a video targeted at pollution prevention on construction sites - launched by the Agency in November 1995 (see Section 3.1). The proportion of industrial incidents arising from the food industry rose from 8% in 1995 to 10% in 1996. Incidents from the engineering industry also increased from 6% in 1995 to 10%. Other important sources were the chemical industry and mining (both 8%).

5.2.3 Historical trends

The total number of substantiated industrial pollution incidents in 1996 was the lowest since 1993, and represents a 16% decrease compared to 1995. The number of incidents decreased notably in four regions, in North West (by 32%), in South West (by 29%) in Welsh (by 26%) and in North East (by 21%).

Direct comparison with previous years is difficult as no figures for substantiated incidents are available for 1988 or 1990, whilst the 1992 figure includes oil related incidents. However between 1993 and 1996 the number of industry related pollution incidents fell by 33%.

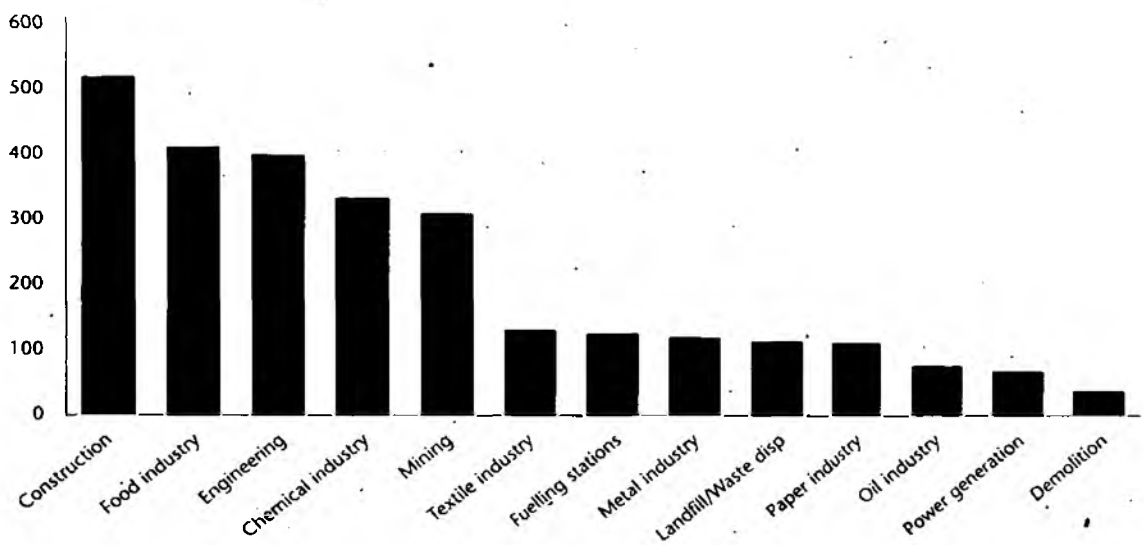


Figure 7
Substantiated industrial pollution incidents (where classified) by source, 1996

Table 7 *Total reported industrial pollution incidents (1990) and substantiated incidents (1991-1996), by Region*

Region	1990*	1991	1992a	1993	1994	1995	1996
Anglian	213	194	584	601	635	399	405
Midlands	350	608	715	727	769	749	833
North East	543	446	827	1,092	745	539	424
North West	267	336	279	1,335	821	948	648
Southern	164	168	236	203	262	239	212
South West	742a	412	653	767	663	711	504
Thames	385	211	351	397	388	330	372
Welsh	138	428	864	880	1,026	848	627
TOTAL	2,802	2,803	4,509	6,002	5,309	4,763	4,025

* *Reported incidents*
a *Includes oil related incidents*

5.2.4 Category 1 incidents

Of the 156 Category 1 incidents, 42 (26%) arose from industrial sources, continuing the reduction seen in recent years. The number of Category 1 industrial pollution incidents in 1996 was 62% lower than in 1993. The largest number of Category 1 incidents was recorded in North East Region (8), and the smallest in Thames Region (3).

A breakdown of Category 1 industrial pollution incidents is shown in Figure 8. The biggest identified sources of these incidents were the chemical industry (8 incidents) and food industry (6 incidents).

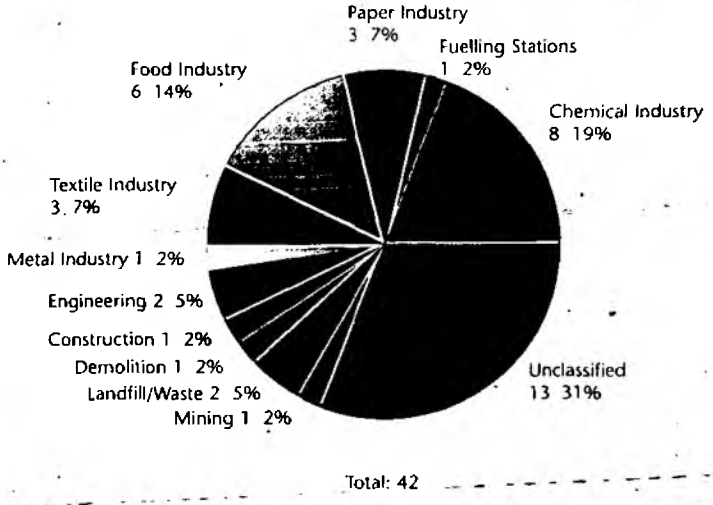


Figure 8 *Substantiated Category 1 industrial pollution incidents, 1996*

5.3 Sewage and water industry related pollution incidents

5.3.1 Total incidents

There were 5,599 substantiated sewage and water industry related pollution incidents in 1996, 28% of the total.

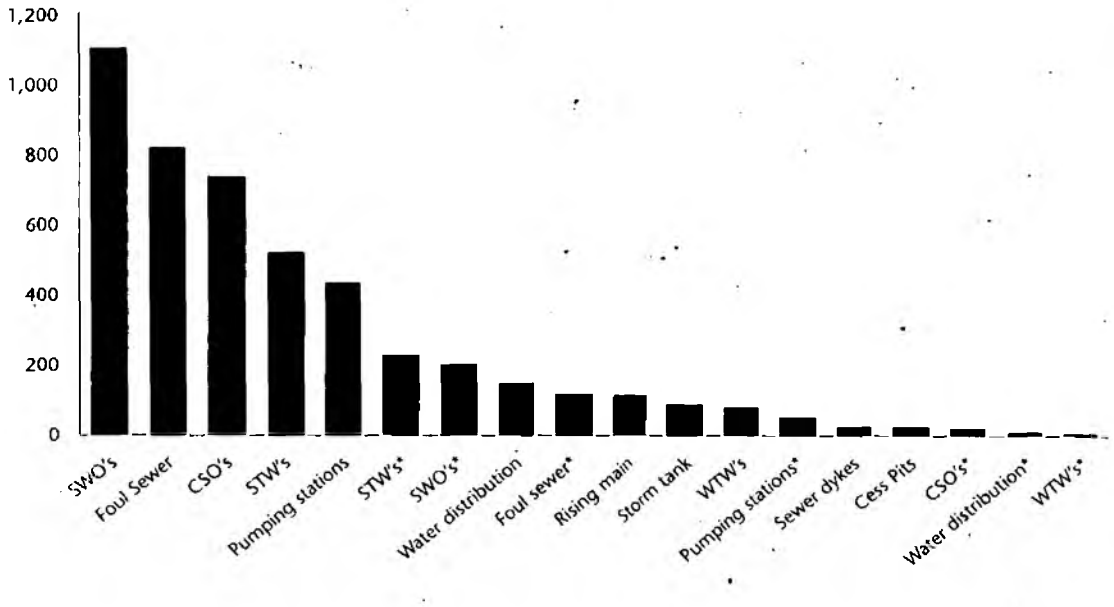
5.3.2 Sources of sewage and water industry related incidents

Figure 9 shows the sources of sewage and water industry related incidents in 1996. As in previous years the biggest source of pollution was Water Service Company surface water outfalls (SWO's) causing 20% of incidents. Foul sewerage systems caused 14% and combined sewer overflows (CSO's) 13%. The largest sources of private sewage and water industry pollution were sewage treatment works (STW's) and SWO's (both 4%).

5.3.3 Historical trends

Table 8 gives the figures for the regional distribution of sewage and water related pollution incidents from 1990 to 1996. This shows a decrease of 22% from 1995 to 1996. The 1996 figure of 5,599 is the lowest since records began. The only region which recorded an increase in sewage and water

Figure 9
Substantiated sewage and water industry related pollution incidents by source, 1996



* Private sewage and water industry sources

incidents was Midlands with 4% more incidents. In all other regions incident numbers fell, notably in South West Region (39%), North West Region (35%) and North East Region (29%). These reductions are related mainly to fewer problems with combined sewer overflows, foul sewers and pumping stations, possibly as a result of low rainfall and therefore lower flows in the sewers.

5.3.4 Category 1 incidents

Of the total number of sewage and water related incidents 31 (less than 1%) were classified as Category 1. This represents 20% of all Category 1 incidents. The largest number of these occurred in Southern Region (23%).

The sources of Category 1 sewage and water related incidents are shown in Figure 10.

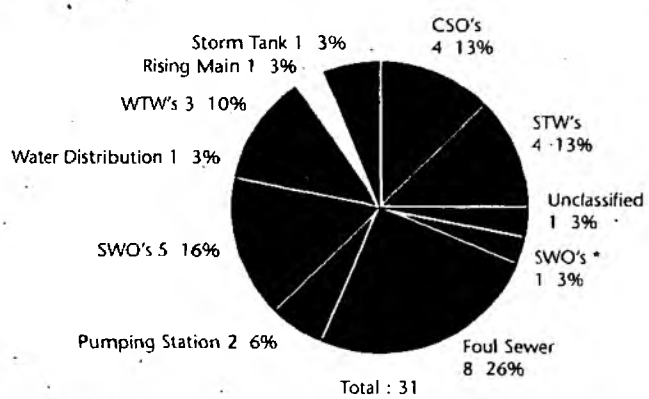


Figure 10
Substantiated Category 1 sewage and water related incidents, 1996

Table 8
Total sewage and water industry related incidents (1990) and substantiated incidents (1991-1996), by Region

Region	1990*	1991	1992	1993	1994	1995	1996
Anglian	362	570	657	586	714	557	461
Midlands	424	1,329	691	1,327	1,337	1,175	1,219
North East	1,214	1,220	1,055	726	1,032	1,013	722
North West	968	986	1,051	1,066	1,028	1,222	801
Southern	487	376	446	227	393	328	298
South West	874	925	1,019	1,124	1,209	1,469	889
Thames	765	416	373	421	414	487	471
Welsh	717	525	858	898	892	905	738
TOTAL	**5,811**	**6,347**	**6,420**	**6,375**	**7,019**	**7,156**	**5,599**

* *Reported incidents*

5.4 Transport pollution incidents

5.4.1 Total incidents

A total of 1,915 transport related pollution incidents were substantiated in 1996, 10% of the national total and the only category of pollution incidents to have increased.

5.4.2 Sources of transport related incidents

The distribution of transport incidents by source is shown in Figure 11. 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 19% and rail transport 5%.

5.4.3 Historical trends

The increasing number of transport incidents from 1993 to 1996 is shown in Table 9. There was an increase of 7% between 1995 and 1996. The largest increases were recorded in Anglian Region (67%) and Midlands Region (59%). The high number of transport incidents in the Midlands reflects the importance of the road networks passing through it. In South West Region there was a 25% decrease.

5.4.4 Category 1 incidents

Twelve transport incidents were classified as Category 1 in 1996, 8% of the total. Of these, 9 were from road transport and the other 3 arose from ships and boats, including the *Sea Empress* incident off the coast of Wales.
The sources of Category 1 transport pollution incidents are shown in Figure 12.

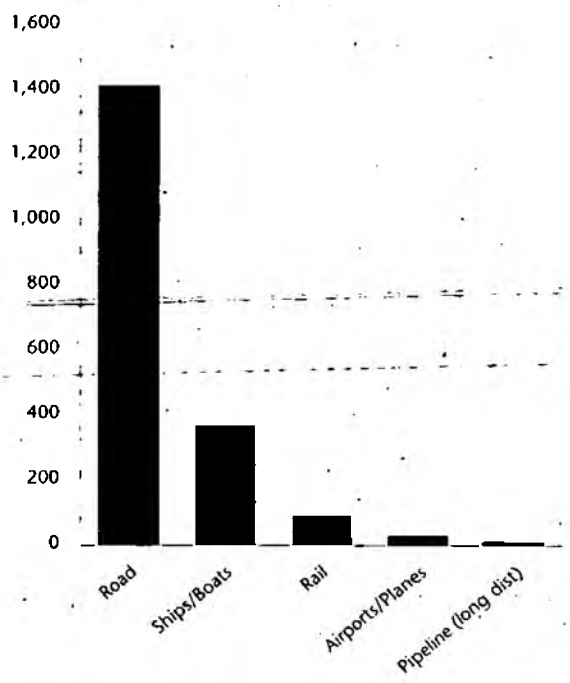


Figure 11
Substantiated transport related pollution incidents by source, 1996

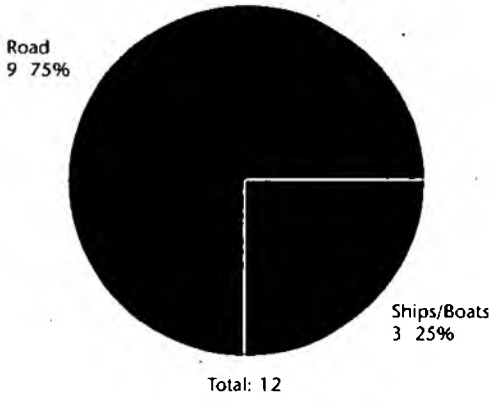


Figure 12
Substantiated Category 1 transport incidents, 1996

Table 9
Total substantiated transport pollution incidents (1993-1996), by Region

Region	1993	1994	1995	1996
Anglian	99	394	216	361
Midlands	202	214	283	450
North East	146	166	129	167
North West	66	122	221	158
Southern	173	120	174	152
South West	403	355	337	253
Thames	192	195	217	201
Welsh	217	217	211	173
Total	1,498	1,783	1,788	1,915

5.5 "Other" sources of pollution

5.5.1 Total incidents

A total of 6,508 pollution incidents from "other" sources were substantiated in 1996, 32% of the total. This category includes incidents whose source did not fall into one of the alternative categories, and those incidents where the source was not found.

5.5.2 "Other" sources of pollution

Of the "other" sources, 44% were incidents whose source could not be traced, representing 14% of all incidents. Domestic and residential premises accounted for 19% of "other" source incidents, (6% of all incidents) restaurants and public houses 3%, schools and other educational establishments 1% and metal recycling sites 1%. These sources are shown in Figure 13.

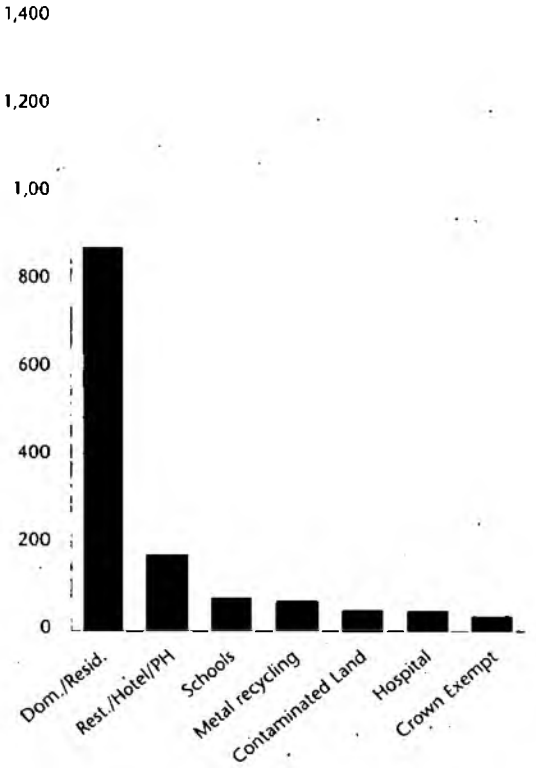


Figure 13
Substantiated "other" sources of pollution incidents (where classified), 1996

5.5.3 Historical trends

The number of "other" source pollution incidents has continued to decline since 1993, when recording in the current format began. Since 1993 the number of "other" source incidents has declined by 23%. This is due at least in part to continued efforts to improve the recording of incident data. The biggest decreases in the past year were seen in Welsh Region (28%), South West Region (24%) and Midlands Region (17%).

5.5.4 Category 1 incidents

Of the 6,508 "other" source pollution incidents 43 were classified as Category 1 - less than 1%. Of these, 2 came from a domestic or residential source, 2 from a crown exempt site, 2 from an educational establishment and 1 from contaminated land. The remaining 36 incidents could not be further classified, or were not traced. The largest number of incidents was recorded in Anglian Region (17), mainly due to algal blooms and low oxygen events which caused significant fish kills.

Table 10
Substantiated "other" sources of pollution (1996), by Region

Region	1992*	1993	1994	1995	1996
Anglian	938	983	750	772	990
Midlands	2,424	2,229	2,166	1,681	1,393
North East	946	1,530	904	675	664
North West	1,523	786	1,158	1,014	936
Southern	336	684	415	371	432
South West	1,695	892	1,088	1,066	813
Thames	1,140	929	909	823	822
Welsh	630	508	585	634	458
TOTAL	**9,632**	**8,541**	**7,975**	**7,036**	**6,508**

* *Includes transport incidents*

Sea Empress
St Annes Head showing oil, tugs and plane spraying dispersant.
Welsh Region

Minewater breakout at Holmfirth.
North East Region

Nitobenzene spill on the A19. North East Region

Abattoir waste spreading. South West Region

Silt from motor-way construction. North West Region

Lorry in the River Tweed. North East Region

Nitrobenzene spill on the A19. North East Region. Photo - Cleveland Fire Brigade

Fire at paint factory. Thames Region

6 Analysis of Incidents by Type of Pollutant

6.1 Organic wastes

6.1.1 Total incidents

A total of 2,129 pollution incidents were attributed to organic wastes in 1996, 11% of the total number of substantiated incidents.

6.1.2 Type of organic waste pollution

The distribution of organic waste pollution incidents is shown in Figure 14. Of this total, the largest number came from cattle slurry (23%), as in previous years. Other significant types were animal carcasses (14%), silage effluent (11%), and yard washings (10%). A total of 307 incidents did not fit into the categories identified (14%). These included incidents related to hay, straw and grain. Only 3% of pollutant types were not identified.

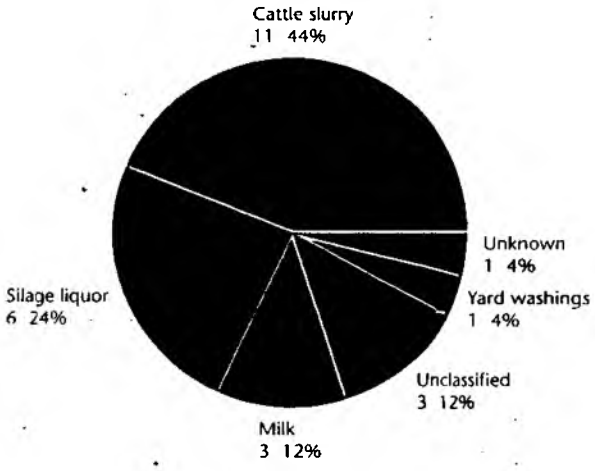
6.1.3 Historical trends

Table 11 shows the regional numbers of organic waste incidents in the years 1993 to 1996, and substantiated farm data for 1992. The number of incidents in 1996 decreased significantly when compared to 1995 (by 21%). This continues a trend of decreasing pollution from agricultural premises. The decreases were most marked in the South West and Welsh Regions (39% and 27% respectively). The number of organic waste pollution incidents rose in only two regions - in Thames Region by 15%, and in Midlands by 4%.

6.1.4 Category 1 incidents

Of the 2,129 organic waste incidents, 25 (1%) were classified as Category 1. This represents 16% of the total number of Category 1 incidents. The types of Category 1 organic waste incidents are shown in Figure 15.

Figure 15
Substantiated Category 1 organic waste pollution incidents, 1996



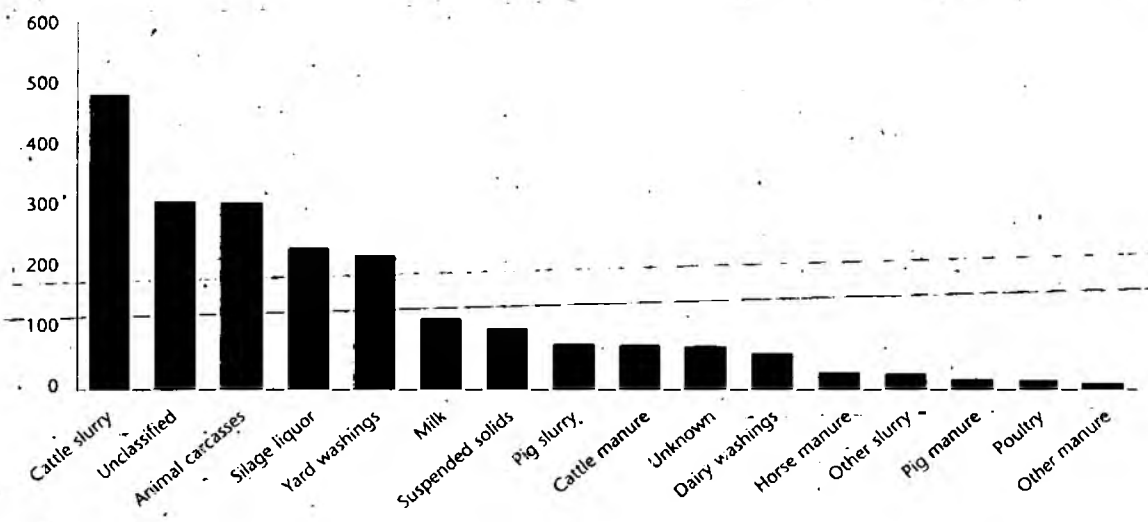


Figure 14
Substantiated organic waste pollution incidents, by type, 1996

Table 11
Total substantiated organic waste pollution incidents (1992-1996), by Region

Region	1992*	1993	1994	1995	1996
Anglian	203	329	311	201	189
Midlands	296	381	368	419	436
North East	228	320	291	183	150
North West	406	398	479	408	341
Southern	63	101	102	84	66
South West	445	848	938	899	549
Thames	69	102	92	75	86
Welsh	425	477	584	430	312
TOTAL	**2,567**	**2,956**	**3,165**	**2,699**	**2,129**

* *Substantiated farm incidents by type*

6.2 Fuels and Oils

6.2.1 Total incidents

There were 5,587 substantiated fuel and oil pollution incidents in 1996, 28% of the total.

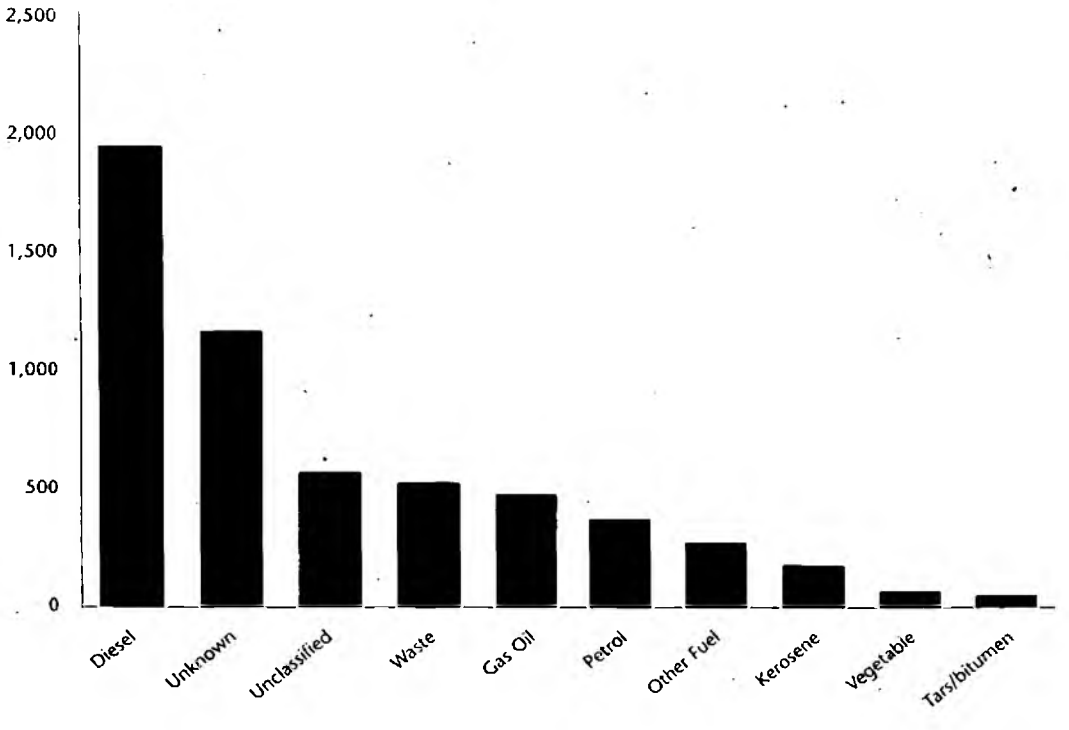
6.2.2 Type of fuel and oil pollution.

Figure 16 gives 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. Waste oil caused 9% of incidents, gas oil 8%, and petrol 7%. In 21% of cases the oil could not be identified.

6.2.3 Historical trends

Table 12 shows the numbers of fuel and oil pollution incidents between 1990 and 1996. The number of these incidents climbed steadily each year from 1991 to 1994. In 1995 the number fell, and fell again in 1996. The number of oil and fuel pollution incidents in 1996 was only 6% greater than that in 1991. The biggest decreases compared to 1995 were in the North West and South West Regions, by 29% and 16% respectively. Minor increases compared to 1995 were recorded in the Thames, Midlands and Anglian Regions.

Figure 16
Substantiated fuel and oil pollution incidents by type, 1996



Region	1990*	1991	1992	1993	1994	1995	1996
Anglian	620	775	873	961	1,023	734	763
Midlands	1,893	1,194	1,379	1,493	1,519	1,197	1,258
North East	593	524	561	597	705	668	562
North West	593	571	719	806	895	828	588
Southern	492	536	357	469	488	470	443
South West	383a	734	945	661	865	909	768
Thames	1,122	851	876	896	896	780	817
Welsh	250	103	426	490	517	439	388
TOTAL	5,946	5,288	6,136	6,373	6,908	6,025	5,587

* *Reported indidents*
a Does not include oil from industrial sources

Table 12
Total reported fuel and oil pollution incidents (1990) and substantiated incidents (1991-1996), by Region

6.2.4 Category 1 incidents

Category 1 incidents involving fuels and oils accounted for less than 1% of the total number of substantiated incidents in 1996. Fuels and oils were responsible for 29 Category 1 incidents, 19% of the total. The largest number of incidents occurred in North East Region (21%) for the second year, followed by North West and Welsh Regions (both 17%). Details of Category 1 incidents are shown in Figure 17. A significant inclusion in the other oil category is the *Sea Empress* incident. Incidents from marine sources are very rarely reported unless the oil washes up on the shore.

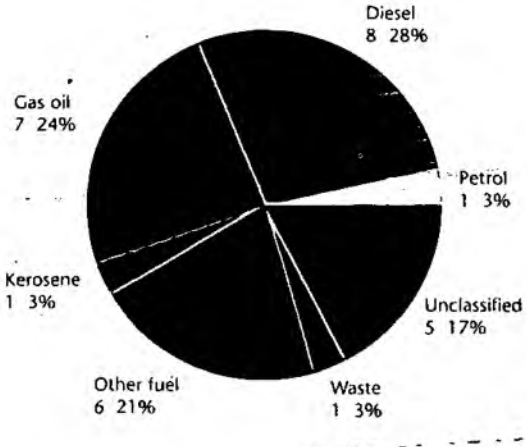


Figure 17
Substantiated Category 1 fuel and oil pollution incidents by type, 1996

6.3 Chemicals

6.3.1 Total incidents

In 1996 there were 1,837 substantiated chemical pollution incidents, representing 9% of all substantiated incidents.

6.3.2 Types of chemical pollutants

The distribution of chemical pollutants by type is shown in Figure 18. Chemicals which could not be classified were responsible for only 13% of incidents, compared to 26% in 1995. Pollution from paints and dyes was the largest identified type (19%), due in part to their visibility. Other major types were detergents (17%) and other organics (11%). It was not possible to identify the chemicals responsible for 7% of the incidents.

6.3.3 Historical trends

Table 13 shows the regional distribution of chemical incidents from 1992 to 1996. The number of pollution incidents due to chemicals rose in 1996 (by 6%), the only category of pollutants to do so. The most notable increases in the past year were in Welsh Region (up by 59%), North East (42%) and Midlands (41%). In South West Region however there was a decrease of 36%.

Figure 18
Substantiated chemical pollution incidents by type, 1996

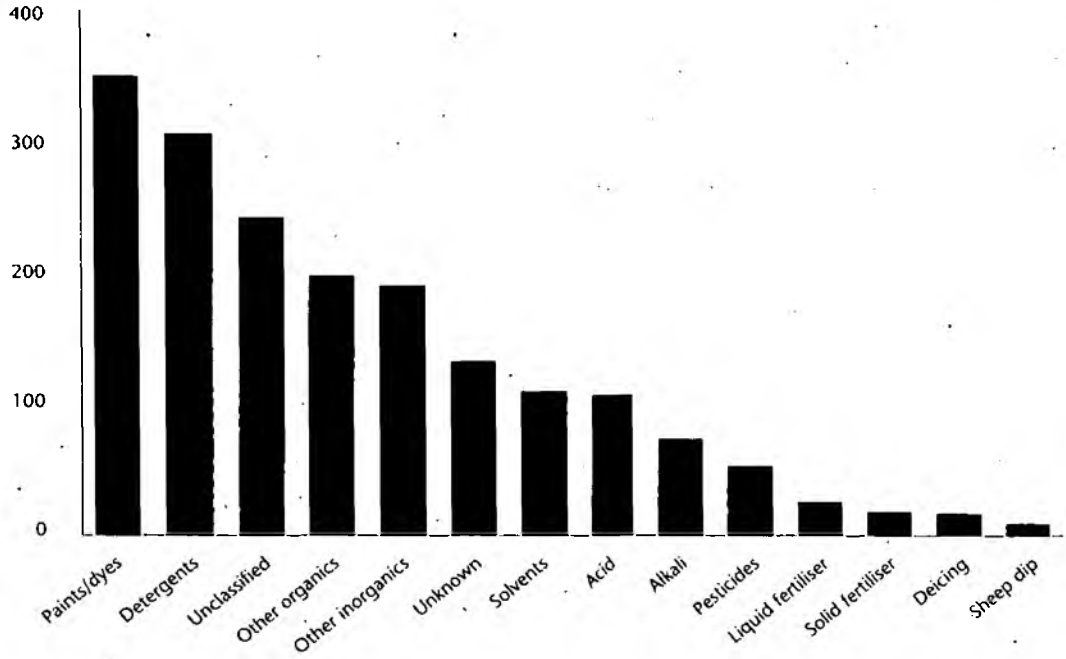


Table 13
Total substantiated chemical pollution incidents (1992-1996), by Region

Region	1992	1993	1994	1995	1996
Anglian	209	198	301	201	239
Midlands	206	281	299	317	446
North East	135	410	251	140	199
North West	236	568	383	359	308
Southern	57	100	129	108	102
South West	124	145	209	302	193
Thames	194	172	178	174	153
Welsh	160	165	134	124	197
TOTAL	**1,321**	**2,039**	**1,884**	**1,725**	**1,837**

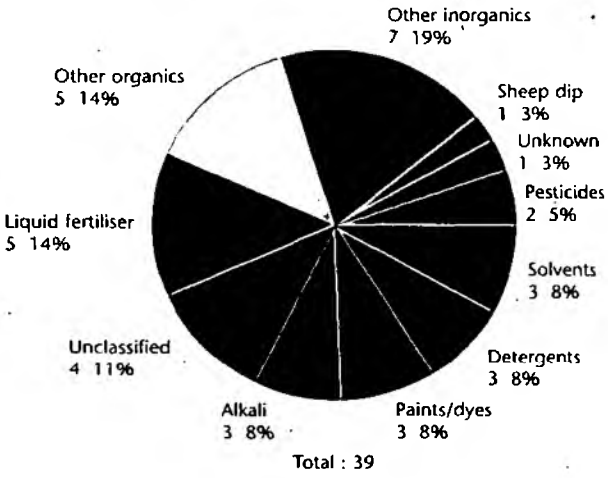


Figure 19
Substantiated Category 1 chemical pollution incidents by type, 1996

6.3.4 Category 1 incidents

Of the chemical incidents 39 (2%) were classified as Category 1. Details of these are shown in Figure 19. These 39 incidents represented 25% of the national total of Category 1 incidents, a similar proportion to previous years. Only 4 Category 1 incidents did not fit into the available sub-categories, again reflecting the improved standard of incident reporting. Of those classified the most common were: other inorganics (7 incidents), other organics and liquid fertiliser (5 incidents each).

6.4 Sewage

6.4.1 Total incidents

In 1996 there were a total of 5,278 substantiated sewage incidents, representing 26% of all incidents.

6.4.2 Types of sewage pollution

Figure 20 shows the distribution of substantiated sewage pollution incidents in 1996. Crude sewage was the most common type of pollutant, accounting for 38% of incidents. Other significant types were storm sewage (18%), septic tank effluent (16%) and treated effluent (10%). Sewage debris was responsible for 4% of incidents. The type of sewage could not be classified in 10% of cases and was unknown in 3% of incidents.

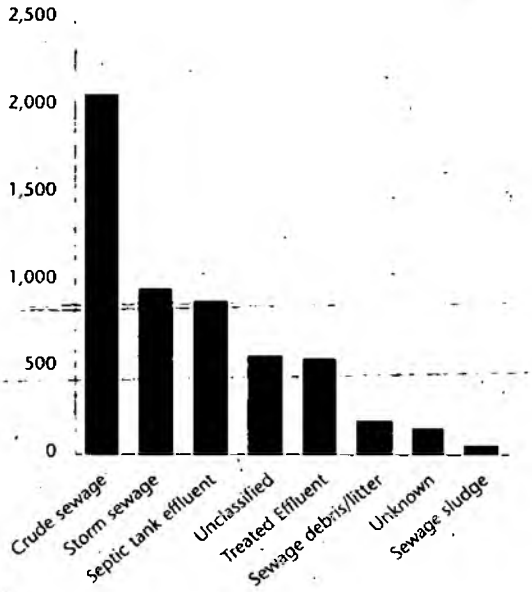


Figure 20
Substantiated sewage pollution incidents by type, 1996

6.4.3 Historical trends

The regional distribution of sewage incidents is shown in Table 14. The number of sewage pollution incidents fell by 14% between 1995 and 1996. The number of incidents declined in all regions except for Midlands and Anglian, where there were minor increases. The biggest reductions were in South West (by 33%), North West (24%) and Welsh (21%) Regions.

The number of sewage pollution incidents in 1996 was 14% lower than in 1992, the first year they were separately recorded.

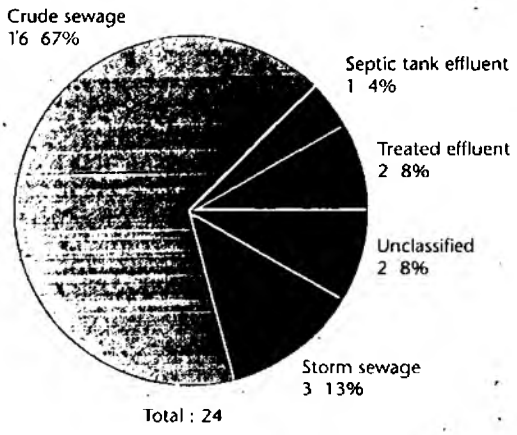


Figure 21
Substantiated Category 1 sewage pollution incidents by type, 1996

6.4.4 Category 1 incidents

There were 24 Category 1 sewage pollution incidents in 1996, representing 15% of Category 1 incidents. This is a reduction of 35% compared with 1995. By far the greatest number of these incidents were of crude sewage (16 incidents), as is shown in Figure 21. The largest number were recorded in the North East and Southern Regions (5 incidents each).

Table 14
Total substantiated sewage pollution incidents (1992-1996), by Region

Region	1992	1993	1994	1995	1996
Anglian	657	586	596	547	555
Midlands	961	1,327	1,320	935	991
North East	1,032	851	992	825	761
North West	1,026	1,066	894	1,103	843
Southern	392	215	322	351	346
South West	857	1,024	930	988	666
Thames	423	468	403	507	428
Welsh	786	836	830	872	688
TOTAL	6,134	6,373	6,287	6,128	5,278

6.5 "Other" types of pollutants

6.5.1 Total incidents

In 1996 there were 5,327 pollution incidents due to "other" pollutant types, representing 26% of the total number of substantiated incidents.

6.5.2 Types of "other" pollutant

The "other" types category contains those incidents which do not fit into any of the previous pollution types. Of those which were classified in more detail, the most frequently found were inert suspended solids (27%), natural causes (16%) and rubble and litter (10%). Incidents where the pollutant was not identified accounted for 23% of "other" types in 1996. This means that the type of pollutant was not identified in only 6% of all substantiated incidents.

6.5.3 Historical trends

The percentage of pollution types classified as "other" has continued to fall, from 29% in 1995 to 26% in 1996, consolidating improvements in reporting made in previous years. The number of incident types classified as "other" rose in 3 regions, notably in Anglian Region (by 42%) but fell substantially in the others, particularly in South West Region (41%) and North East and Welsh Regions (both by 38%).

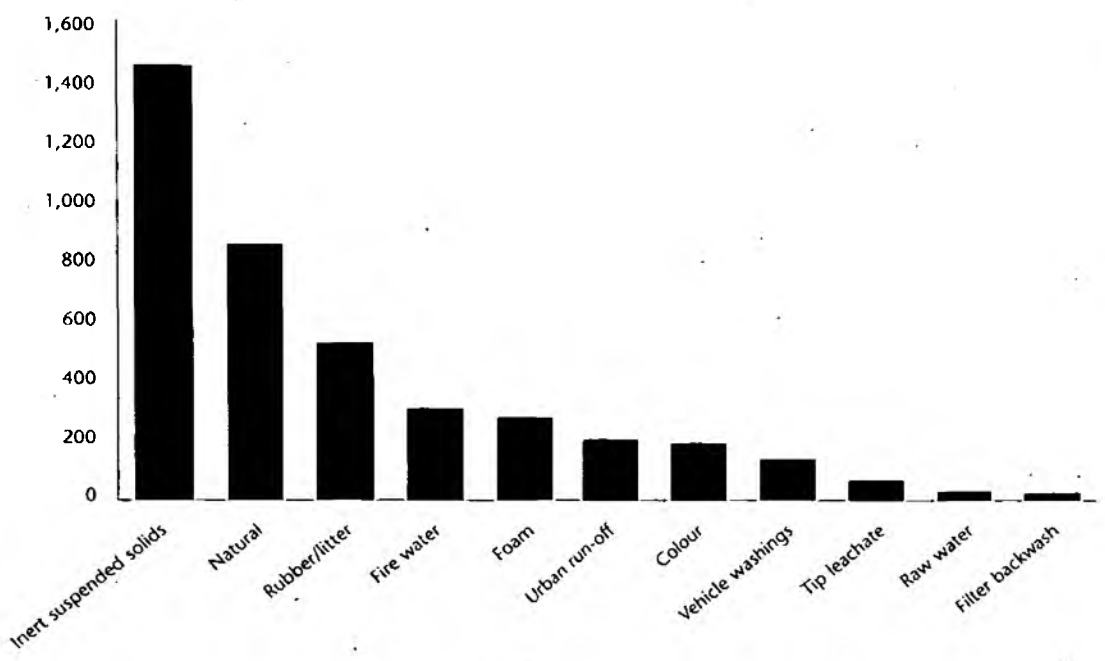
Region	1993	1994	1995	1996
Anglian	551	588	473	671
Midlands	1,394	1,389	1,391	1,174
North East	1,464	1,004	760	471
North West	818	881	1,019	738
Southern	470	275	222	232
South West	1,451	1,398	1,460	866
Thames	433	410	436	475
Welsh	977	1,199	1,125	700
TOTAL	7,558	7,171	6,886	5,327

Table 15
Substantiated "other" pollution incidents (1993-1996), by Region

6.5.4 Category 1 incidents

Of the 39 Category 1 incidents where type was recorded as "other", 16 were not identified. Of these, 12 were due to natural causes and 4 to urban runoff, both types typical of a dry summer.

Figure 22
Substantiated "other" pollution incidents by type, where classified, 1996



7 LEGAL ACTION

7.1 Introduction

This section reports on the legal action undertaken by the NRA and the Environment Agency in 1996. Due to the length of time taken to bring a case to court, a large number of cases will be outstanding at the end of each year. Data on the total number of prosecutions relating to incidents in 1995 is shown in Appendix B, whilst data in Tables 16 - 21 relate only to incidents which occurred in 1996. However in section 7.7 we report on examples of prosecutions occurring in 1996 irrespective of the year of the offence.

7.2 Prosecution policy

It is the Agency's policy to prosecute Category 1 pollution incidents whenever there is adequate evidence to support the case. This is not always possible, because the source cannot always be traced, the incident was due to natural causes or because the incident was the result of the actions of unknown persons. The policy for Category 2 incidents is less rigid, and allows for the use of formal cautions or warning letters where appropriate. As from the 1st of January 1997 the Agency will also be able to take precautionary legal action, in the form of an Enforcement Notice, to prevent pollution occurring. See Section 1.3.

7.3 Court cases

The regional distribution of prosecutions taken and convictions obtained for offences occurring in 1996 are shown in Table 16. By the end of December 1996, 139 of these prosecutions had been heard in court and 97% of these resulted in conviction. As at the 1st January 1997, there were 91 cases which still had to come to court. Legal action (prosecution or caution) was taken or expected in 20% of all Category 1 and 2 incidents. This compares with 21% in 1995 and 9% in 1994.

7.4 Cautions

In addition to the court action taken against polluters, the Agency can also issue formal cautions. The purpose of these is to deal quickly with less severe incidents, whilst reducing the chances of further pollution being caused. A caution can be produced in court if a polluter offends again. Before a caution can be issued there must be evidence of the polluter's guilt. The polluter must admit the offence and give informed consent to being cautioned. If the polluter refuses to sign the caution, they are prosecuted for the pollution offence. The regional distribution of cautions issued in 1996 is also given in Table 16. On the 1st January 1997 69 cautions had been issued and 37 were outstanding.

7.5 Prosecutions by source and type

Tables 17 and 18 give the number of Category 1 and 2 prosecutions taken and convictions obtained by pollution source and type.

7.6 Fines

Detailed information on fines for pollution offences are shown in tables 19, 20 and 21. The largest fine imposed by a Magistrates Court was £15,000. The maximum fine available in the Magistrates Court under Section 85(6) of the Water Resources Act remains £20,000. In the Crown Court there is no limit to the fine, and a fine of £175,000 was

Region	Number of incidents prosecuted	Number of convictions	Outstanding prosecutions	Number of cautions	Number of cautions still to be issued at 31st Dec 1996
Anglian	19	19	12	3	6
Midlands	41	41	8	5	6
North East	14	11	6	17	0
North West	25	25	25	28	10
Southern	4	4	1	1	0
South West	16	16	7	0	8
Thames	16	15	6	5	1
Welsh	4	4	26	10	6
TOTAL	139	135	91	69	37

Table 16 *Regional distribution of prosecutions and convictions for incidents (1996), by Agency Region*

Table 17
Prosecutions taken and convictions obtained for Category 1 and Category 2 incidents (1996), by pollution source

Pollution source	Category 1			Category 2		
	Incidents	Prosecution	Convictions	Incidents	Prosecution	Convictions
Agricultural	28	7	7	283	37	37
Industrial	42	12	11	465	39	38
Sewage & Water Ind.	31	4	3	365	9	8
Transport	12	1	1	84	1	1
Other	43	4	4	313	25	25
TOTAL	**156**	**28**	**26**	**1,510**	**111**	**109**

Table 18
Prosecutions taken and convictions obtained for Category 1 and Category 2 incidents (1996), by type of pollutant

Pollution source	Category 1			Category 2		
	Incidents	Prosecution	Convictions	Incidents	Prosecution	Convictions
Organic Wastes	25	7	7	287	36	36
Oil	29	10	9	408	28	28
Sewage	24	4	3	338	11	10
Chemical	39	6	6	197	12	12
Other	39	1	1	280	24	23
TOTAL	**156**	**28**	**26**	**1,510**	**111**	**109**

Table 19
Fines and costs awarded on conviction for pollution incidents occurring in 1996, by Region

Region	Range of fines £	Range of costs £
Anglian	450 - 15,000	400 - 5,300
Midlands	200 - 15,000	250 - 15,999
North East	250 - 14,000	250 - 14,000
North West	300 - 12,000	0 - 3,713
Southern	0 - 12,000	274 - 1,428
South West	0 - 4,000	500 - 1,000
Thames	150 - 8,000	0 - 484
Welsh	850 - 2,000	200 - 600
All regions	**0 - 15,000**	**0 - 15,999**

Table 20
Fines and costs awarded on conviction for pollution incidents occurring in 1996, by pollution source

Pollution Source	Range of fines £	Range of costs £
Agriculture	0 - 6,000	0 - 5,300
Industry	200 - 15,000	274 - 3,577
Sewage & Water Industry	400 - 7,500	210 - 7,999
Transport	500 - 10,000	200 - 1,752
Other	500 - 2,000	120 - 15,999

Pollution Source	Range of fines £	Range of costs £
Organic Waste	0 - 15,000	0 - 5,300
Oil	500 - 10,000	275 - 15,999
Sewage	200 - 14,000	210 - 3,713
Chemical	1,000 - 15,000	250 - 2,207
Other	700 - 12,000	120 - 1,428

Table 21
Fines and costs awarded on conviction for pollution incidents occurring in 1996, by type of pollutant

imposed on Severn Trent Water in relation to an incident in 1995 (for details see section 7.7.2). In deciding the level of fine the court takes in to account both the severity of the offence and the defendant's ability to pay.

7.7 NRA and Agency Prosecutions in 1996

7.7.1 Introduction

This section highlights a number of incidents where legal action was taken in 1996. The cases illustrate both the type of incidents that the NRA and Agency dealt with, and the operation of the legal process.

7.7.2 Highest fine

Environment Agency v Severn Trent Water

On the 5th August 1996 Severn Trent Water were fined a total of £175,000 at Cardiff Crown Court for polluting the River Elan near Rhayader, Mid Wales on the 25th June 1995. The pollution was caused by the discharge of approximately one and a half tonnes of ferric sulphate from their water treatment works and caused the deaths of approximately 35,000 fish.

The fine comprised £100,000 under S.85 of the Water Resources Act 1995 and £75,000 under S.4 of the Salmon and Freshwater Fisheries Act 1975. The company was also instructed to pay £8,473 towards restocking costs and £35,296 in costs to the Agency.

This demonstrates the huge expense which can be involved in a pollution incident and the very serious view taken by the courts in this case.

7.7.3 Failure to contact the Agency

Environment Agency v Automotive Precision Components

If a company which has a spillage contacts the pollution experts at the Agency quickly, much can be done to ameliorate the effects of pollution, or even prevent it altogether. Furthermore, if legal action is taken, the court will look more favourably on a company which has tried to mitigate the effects of its actions.

Automotive Precision Components of Kent allowed cutting oil to enter the Botany Stream in Tonbridge in March 1996, after a delivery pipe had come apart in a workshop at night. The company did not contact the NRA and made no serious attempt to limit the effects of the incident. The oil affected the Botany Stream and 3.5 kilometres of the River Medway.

Sevenoaks magistrates fined the company £12,000 and awarded the Agency £926 in costs. Had the company contacted the Agency immediately a large proportion of these expenses could have been avoided.

7.7.4 Co-operation with other agencies

Environment Agency v Falcon Foods Limited

A difficult and complex prosecution was brought by the Agency's Anglian Region in September 1996, when Falcon Foods was fined £10,000 for pollution offences and ordered to pay £5,387 costs. Ammonia from the company's refrigeration system was allowed to enter the surface water drainage system, and was then discharged into the River Rase where it caused a fish kill. As the polluting discharge was via a surface water sewer, the case involved not only Agency staff, but also many Anglian Water Services employees. The case preparation therefore required liaison and statement taking from many external witnesses. The successful conclusion reflects well on the Agency's ability to deal with a complicated prosecution and work in partnership with other agencies.

7.7.5 Previous history

Environment Agency v HP Foods

On 11th November 1996 HP Foods pleaded guilty to causing water pollution from their Worcester factory. A pipe carrying Worcester Sauce ingredients fractured, discharging highly organic liquid into the

surface water system leading to the Worcester and Birmingham canal. The fractured pipe was not noticed by the company for two and a half days, when it was pointed out by an Agency Officer. There were no procedures in place for checking for spillages. Fortunately there was heavy traffic on the canal which aerated the water and prevented a fish kill.

HP Foods co-operated fully with the Agency after the incident, but (trading as Lea and Perrins) had a previous conviction for a water pollution offence, and were fined £7,500 plus costs.

Environment Agency v Laughton and Sons Limited

On the 6th September 1996 Laughton and Sons Ltd pleaded guilty to causing poisonous, noxious or polluting matter to enter a watercourse, the Chinn Brook in Birmingham. Chromium waste had been placed in a skip which should only have contained dry materials and was spilt when the skip was lifted onto the back of a vehicle. The amount of chromium found in the Chinn Brook was more than 120 times greater than the environmental quality standard (EQS) limit of 250 µg/l.

The magistrates were concerned at the lack of facilities at the site to deal with the spill, and the Agency produced a letter as evidence that the company had been warned in the past that such an incident could occur. These concerns contributed to the high fine, three quarters of the maximum which can be awarded in a magistrates court. Laughton and Sons were fined £15,000 and ordered to pay £275 costs to the Agency.

7.7.6 Vandalism

Environment Agency v Ennemix Construction Materials Limited

On 7th October Ennemix Construction Materials Limited pleaded not guilty to causing oil pollution from their site in January 1996. The company claimed that the pollution was caused by the removal of a tap from an oil storage tank by an unknown third party. The defence ran the Impress v Rees vandalism defence, which set the precedent that if a third party caused the pollution, then the defendant is not guilty. The Agency argued that a cause of the poilution was the conduct of the defendants operations and so the company were guilty regardless of any alleged vandalism. The site had poor security arrangements, and the oil tank was unbunded. The Agency were also able to produce correspondence showing that pollution prevention advice had been given to the company on numerous occasions. The magistrates examined the 'chain of causation' which led to the oil discharging to the river and found the company guilty. They were fined £7,000 and ordered to pay £11,048 costs.

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 UK legislation for the recovery of the costs of water pollution from the polluter.

In the past, costs were often recovered as part of a criminal prosecution. However Section 161 of the Water Resources Act gave the NRA and the Agency the power to make a civil claim for clean-up costs independent of any criminal action. Following a study of how costs were recovered throughout the NRA, new guidance was introduced in April 1995 to standardise the approach to cost recovery in all the regions. The Agency has continued to use these guidelines. Investigation and clean-up costs are recovered whenever the polluter is identified and more than one hour of time is spent on an incident. The value of costs recovered rose by 92% when compared to 1995. Table 22 illustrates the costs recovered in 1996.

Table 22
Costs recovered (1996), by Agency Region

Region	Number of recoveries	Total amount billed £	Range of costs billed £
Anglian	308	109,000	11 - 4,411
Midlands	624	289,457	11 - 37,637
North East	586	258,300	45 - 141,428
North West	575	91,338	50 - 4,000
Southern	287	113,284	26 - 10,044
South West	674	241,103	24 - 11,523
Thames	260	132,274	28 - 36,961
Welsh	318	135,606	21 - 10,063
All regions	3,632	1,370,362	11 - 141,428

8 Conclusions and recommendations

It is possible to draw a number of conclusions from this report and trends over recent years and to identify where the Agency needs to concentrate its efforts to prevent water pollution. These include the following findings.

8.1 Fall in pollution incidents

For the first time since 1989 the number of reports of water pollution has fallen. This is despite the additional publicity which accompanied the transition from the NRA to the Environment Agency. Substantiated incidents have also fallen for the second consecutive year. However, 1996 was an unusually dry year (as was 1995) and such conditions have in the past resulted in a reduction in the number of incidents. This is expected due to the reduced volumes of waste water on farms and improved conditions for its disposal, less storm water discharges from sewers and treatment plants and reduced run-off from industrial sites and urban areas. It is impossible to quantify this effect. However, it is likely that a return to normal rainfall patterns could be accompanied by an increase in pollution incidents.

8.2 Pollution prevention

The pollution prevention initiatives developed by the NRA (and adopted by the Agency) aim to reduce pollution by working both nationally and locally with industry, farmers, other public bodies and the public. The Agency aims to provide authoritative advice and to promote pollution prevention techniques, such as Best Management Practices for surface water disposal, in order to secure a continued decline in the number of water pollution incidents. The Agency will build on existing links with industry and agriculture to further reduce oil and agricultural pollution whilst establishing new partnerships where there is a need.

8.3. The need for oil storage regulations

The Oil Care Campaign was launched in January 1995 and has received considerable support from the petroleum industry. For the second consecutive year the number of oil and fuel incidents has fallen. Although the fall in numbers is welcome, and may reflect the joint efforts made in the campaign, oils and fuels still account for 28% of all pollution. These incidents are estimated to have cost in excess of £1.4 million in Agency resources alone, in addition to the value of the lost product and other related costs. This emphasises again the need for simple regulations on the storage of oil and fuel and the cost to the economy of inadequate facilities.

8.4 Farm pollution - new sheep dip formulation

The number of farm pollution incidents has continued to fall, reflecting both the efforts of farmers and the Agency in pollution prevention and the dry weather. One area of concern which has been identified relates to a change in the formulation of sheep dip to synthetic pyrethroid insecticides. Although less harmful to dip operators, these are even more toxic to aquatic life than earlier formulations and a number of pollution incidents relating to their use have occurred. The Agency plans not only to monitor this, but to initiate a publicity campaign to highlight good practice in the storage, use and disposal of sheep dips.

8.5 Food industry

In the industrial sector the food industry was responsible for the largest number of pollution incidents after construction, overtaking the chemical industry. Many food companies are unaware of the potential for water pollution from foodstuffs and as a consequence do not take sufficient precautions. The Agency will need to monitor the position and, if appropriate, instigate a pollution prevention campaign in association with the industry.

8.6 Transport

For the third year in succession the number of transport related pollution incidents has risen, with road transport accounting for the majority. Although improved liaison with the fire services has helped to minimise the effect of such incidents, there is a need to improve the marking of tankers carrying non toxic but potentially polluting loads such as milk and beer. Discussions on this between the Agency and relevant industry bodies are now under way. A further area for action relates to highways drainage design, where there is a need to identify what improvements can be made to new and existing road drainage to minimise the impact of accidents.

8.7 Water company investment

Water company investment is continuing to have an effect on the number of pollution incidents. However, the weather in the last two years has been unusually dry, resulting in a reduced number of storm discharges and lower flows in sewers and at sewage treatment plants. The reduction in sewage related pollution incidents needs, therefore, to be treated with caution. The Agency continues to be concerned about the failure of automated equip-

ment and related telemetry and alarm systems, which have again been responsible for a number of serious incidents.

8.8 Cost recovery income - making the polluters pay

Following the introduction of clear internal guidance on the recovery of our costs following a pollution incident, the Polluter Pays Principle has resulted in an increasing proportion of our costs being recovered from the polluter. In 1996 this resulted in over 3,600 such recharges with a total value of nearly £1.4 million compared with only £713,298 in 1995.

9 REFERENCES

NATIONAL RIVERS AUTHORITY (1992).
The Influence of Agriculture on the Quality of Natural Waters in England and Wales - 1990. Water Quality Series No. 6.

NATIONAL RIVERS AUTHORITY (1992).
Water Pollution Incidents in England and Wales - 1990. Water Quality Series No. 7.

NATIONAL RIVERS AUTHORITY (1992).
Water Pollution Incidents in England and Wales - 1991. Water Quality Series No. 9.

NATIONAL RIVERS AUTHORITY (1993).
Water Pollution Incidents in England and Wales - 1992. Water Quality Series No. 13

NATIONAL RIVERS AUTHORITY (1994).
Water Pollution Incidents in England and Wales - 1993. Water Quality Series No. 21

NATIONAL RIVERS AUTHORITY (1995).
Water Pollution Incidents in England and Wales - 1994. Water Quality Series No. 25

NATIONAL RIVERS AUTHORITY (1992).
Policy and Practice for the protection of Groundwater

ENVIRONMENT AGENCY (1996).
Water Pollution Incidents in England and Wales - 1995. The Stationery Office.

ENVIRONMENT AGENCY (1996).
Groundwater Pollution: evaluation of the extent and character of groundwater pollution from point sources in England and Wales.

CIRIA (1997). *Report 163 - Construction of bunds for oil storage tanks.* CIRIA, 6 Storey's Gate, Westminster, London.

APPENDIX A

Definitions

Environment Agency Definitions 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 which involves 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.

MAFF definition of a serious incident

An incident that has any of the following effects and includes all cases where legal proceedings are initiated:

(a) downgrades the class of any watercourse classified in the River Quality Survey by more than 10% over 0.5 km;
(b) interferes with water abstraction through quantity and quality;
(c) results in fish mortality;
(d) causes significant interference with legitimate uses of water, including stock watering;
(e) adversely affects any SSSI, nature reserve or area of high conservation interest.

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 which upon investigation proves to be unsubstantiated, ie. no evidence can be found of a pollution incident having occurred.

APPENDIX B

Prosecutions relating to pollution incidents which occurred in 1995, irrespective of the date of hearing.

Region	Prosecutions	Convictions
Anglian	24	24
Midlands	55	55
North East	24	21
North West	49	49
Southern	22	22
South West	56	56
Thames	25	24
Welsh	25	24
All regions	280	275

APPENDIX C

Environment Agency Pollution Prevention Materials

POLLUTION PREVENTION MATERIALS

- ☐ PPG1 - General guide to the prevention of pollution of controlled waters
- ☐ PPG2 - Above ground oil storage tanks
- ☐ PPG3 - The use and design of oil separators in surface water drainage systems
- ☐ PPG4 - Disposal of sewage where no main drainage is available
- ☐ PPG5 - Works in, near or liable to affect water courses
- ☐ PPG6 - Working at demolition & construction sites
- ☐ PPG7 - Fuelling stations: construction & operation
- ☐ PPG8 - Safe storage & disposal of used oils
- ☐ PPG9 - Pesticides
- ☐ PPG10 - Highway depots
- ☐ PPG11 - Industrial sites
- ☐ PPG12 - Sheep dip
- ☐ PPG13 - The use of high pressure water & steam cleaners
- ☐ PPG14 - Boats and marinas
- ☐ PPG15 - Retail premises
- ☐ PPG16 - Schools and other educational establishments
- ☐ PPG17 - Dairies and other milk handling operations
- ☐ PPG18 - Control of spillages and fire fighting run-off
- ☐ PPG19 - Garages and vehicle service centres
- ☐ PPG20 - Dewatering underground ducts and chambers

- ☐ River pollution and how to avoid it
- ☐ Chemical pollution and how to avoid it
- ☐ Pollution from your home and how to avoid it
- ☐ Solvent pollution and how to avoid it
- ☐ Silt pollution and how to avoid it
- ☐ Farm pollution and how to avoid it
- ☐ Silage pollution and how to avoid it
- ☐ Farm waste management plans
- ☐ Wrong connections
- ☐ Farm waste regulations 1991

- ☐ Follow the Oil Care Code
- ☐ Oil Care at Home
- ☐ Oil Care at Work
- ☐ Oil Care on Your Boat
- ☐ Use Your Brain sticker
- ☐ Oil Tank Sticker
- ☐ Domestic Oil Tank Sticker
- ☐ Car Window Sticker

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

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ENVIRONMENT AGENCY

This report covers the calendar year 1996 and records the water pollution incidents occuring in England and Wales. It includes details for the last three months operation of the National Rivers Authority and the first 9 months of the Environment Agency.

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