EA WATER QUALITY

Water Pollution Incidents in England and Wales 1995

ENVIRONMENT AGENCY

Water Pollution Incidents in England and Wales 1995

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Milk tanker incident, Northumbria & Yorkshire Region

Executive Summary

The National Rivers Authority (NRA) responded to 35,891 reports of pollution in 1995 and on investigation 23,463 of these were substantiated. These figures show a small increase in the number of reports and a decrease of nearly 8% in the number of substantiated pollution incidents. For the third year running there has been a decrease in the number of the most environmentally harmful Category 1 (Major) incidents, from 229 (1994) to 199 this year.

A number of factors are likely to have influenced the overall picture. The level of reporting has risen steadily as a result of the public becoming more familiar with the NRA's pollution hotline, which was introduced in 1993, and also because of improved communications with the Fire Services (resulting from the Memorandum of Understanding which was signed in 1993). The continued reduction in the number of major incidents provides evidence that the efforts made by the NRA to promote pollution prevention, backed by firm legal action for those who cause pollution, have had an effect. Since 1990 the number of major incidents has fallen very significantly in the agricultural sector, from 239 to 32. The number of major oil incidents has fallen from 87 to 45 over the same period. Both of these are areas which have been directly targeted by NRA pollution prevention initiatives in recent years. However, the proportion of major incidents as a result of road accidents has risen slightly, indicating an area where action may be required.

Pollution incidents are categorised by both source and type of pollution. By source, the sewage and water industry accounted for the greatest proportion (30%) of incidents (see Figure A below) and of these, surface water outfalls and combined sewer overflows accounted for the largest proportion. The construction industry was the most frequently identified source of industrial pollution for the second consecutive year, whilst dairy farming was the major source of agricultural pollution.

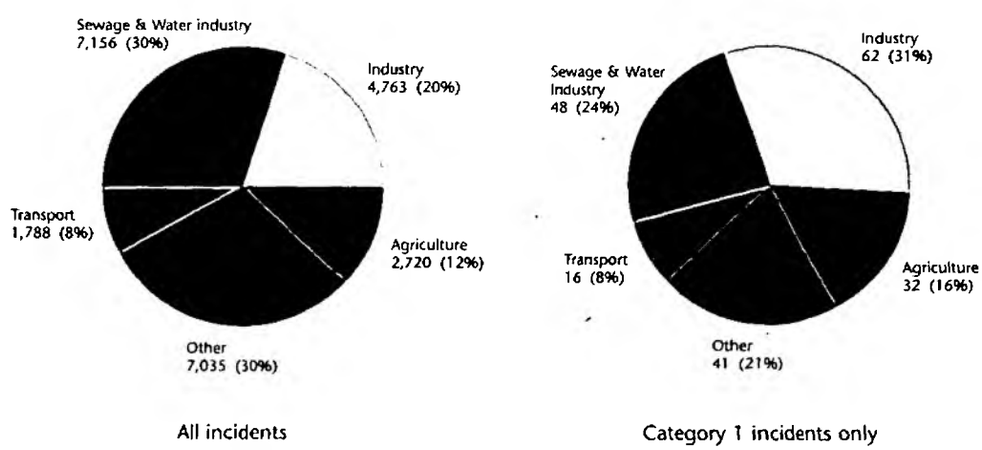

Figure A ***Distribution of substantiated pollution incidents by source, 1995***

By type of pollutant, both sewage and oil accounted for 26% (see Figure B below). Efforts have been made to improve our recording of incident data and as a result fewer are recorded as "other". Inert suspended solids were the most common pollutant in the "other" category, accounting for 6% of all incidents. Cattle slurry was the most frequently identified organic waste and paints and dyes the principal type of chemical. Where identification was possible, diesel was the most commonly identified oil, but in 36% of oil pollution incidents the type of oil could not be determined. The most notable change has been the 13% fall in the number of oil pollution incidents since 1994. Oil pollution has been the subject of intensive pollution prevention activity (the Oil Care Campaign), involving the NRA, local authorities and the oil industry over the last two years.

Prosecutions were brought for 163 incidents and 149 polluters were successfully convicted. At the 1st of January 1996 there were 151 cases for incidents in 1995 that were due to go before the courts. The highest single fine, of £17,000, was imposed on Severn-Trent Water following a discharge of crude sewage as a result of a failure at a sewage treatment works. However, Railtrack and British Rail were each fined £15,000 following an oil pollution incident involving a rail tanker in the Midlands.

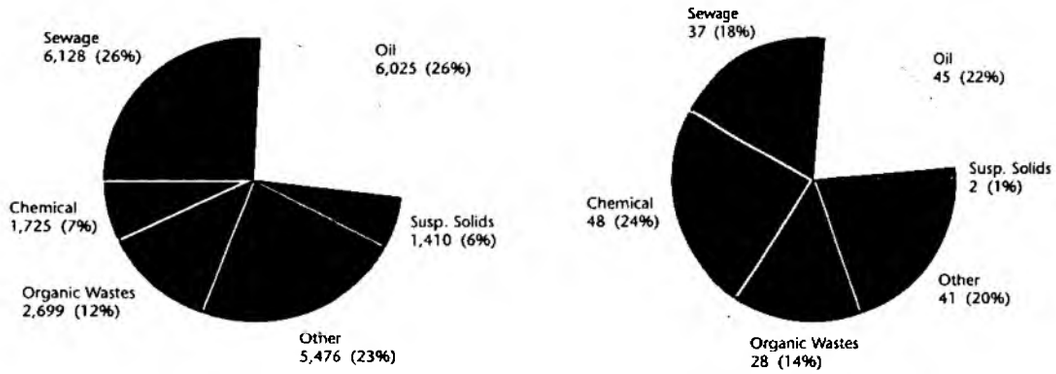

Figure B ***Substantiated pollution incidents by type, 1995***

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1 Introduction

1.1 Background

This is the sixth and final annual analysis of pollution incident and prevention information to be prepared by the National Rivers Authority (NRA). It provides details of the water pollution prevention and control work undertaken in 1995, with data on incidents reported by both source and type of pollution. Because of the time taken to prepare and print the report, it will be published by the Environment Agency.

1.2 Definitions

The NRA uses a standard pollution incident classification system throughout its eight regions. This was revised at the end of 1994 and a modified system introduced from the 1st of January 1995. The new scheme added a fourth category, "no pollution", to the existing three categories, and clarified the criteria for the remaining three categories. Appendix A details the new scheme. In addition, the criteria used prior to 1989 to define a serious incident with respect to agricultural pollution are included for comparative purposes.

1.3 Effect on data of new classification criteria

The purpose of changing the incident classification criteria was to ensure that, as far as possible, incidents would be classified uniformly throughout the NRA by producing criteria that could not be misinterpreted, along with clearer guidance on their application and the inclusion of unsubstantiated incidents as Category 4. The most significant change relates to Category 3 incidents, where the phrase "no notable effect" has been replaced with a set of examples.

The other significant change is the inclusion in Category 1 of major incidents where, as a result of a significant effort in managing the situation, no pollution occurred. Although the number of such incidents is small (3%), their inclusion recognises that even a major incident need not result in pollution if the appropriate response is made.

1.4 Current and future developments

The Environment Act was passed in July 1995, paving the way for the creation of the Environment Agency from the 1st of April 1996. This will bring together the work of Her Majesty's Inspectorate of Pollution, the NRA and Waste Regulation. Despite the changes this will cause, the essential work of preventing and managing pollution will continue.

The Act makes significant changes to the Water Resources Act of 1991. One in particular is the extension of the powers under Section 161 to allow the Agency to serve a notice to do works needed to prevent or mitigate the effects of pollution of controlled waters. The Agency will be able to serve a notice on any person responsible for a facility where there is a serious threat of pollution, specifying both what needs to be done to remove the threat and a timescale. This is a wide ranging power and the Agency is committed to its use in a fair and consistent manner. This provision will help to strengthen the Agency's hand in its pollution prevention activities.

The Environment Agency will retain the emergency hotline (0800 80 70 60) system for the reporting of environmental incidents. This has been highly successful in improving the ease of reporting for both the public and industry. It is manned 24 hours a day and handled in excess of 31,600 calls in 1995, of which over half related to water pollution. The number of calls is expected to increase as members of the public wishing to report illegal waste disposal operations and discharges from major sites subject to Integrated Pollution Control will now use the Hotline.

2 Pollution Incident Management

This section illustrates by examples the type of pollution incidents that occur. A cross section has been chosen to demonstrate the actions needed both to investigate a pollution incident and to control its impact. There were on average 98 reported pollution incidents per day in 1995 and although the majority were minor, they all needed to be investigated properly. In some cases the source of pollution is readily found, but there are many cases where the pollution only occurs under certain conditions, or it has to be traced through surface water sewers, and lengthy investigations may be required. Although new methods of controlling and alleviating pollution are constantly being developed, their use needs to be adapted for each particular set of circumstances, often requiring the ingenuity of our experienced staff to ensure they are used effectively.

2.1 Major Incidents

There were 199 major incidents in England and Wales in 1995. In every case NRA pollution control staff tried to arrive on site within the published target response times of 2 hours during office hours and 4 hours at other times. Once pollution has been confirmed, pollution control staff take the necessary steps to minimise its impact, warn those who may be affected, trace the source, prevent further discharge and collect evidence for any resulting legal action. A selection of photographs illustrating some of these incidents is shown on pages 25 to 28.

2.1.1 Agricultural

Slurry store

On the 7th of July 1995, during a student barbecue at Aberystwyth University's Tanygraig Farm at Llanfarian, the two locks on a 680,000 litre slurry store were vandalised and the valves opened. The incident was discovered by farm staff who closed the valves and called in the NRA and the Police. A series of dams was constructed on the ditches which run to the Afon Ystwyth and the 150,000 litres of slurry which had been discharged were contained, so preventing damage to the river. River flow was low at the time and a number of large salmon were present in pools immediately downstream. Two students were interviewed and subsequently cautioned by the Police following the incident. In this case prompt action by the staff and the NRA prevented the spillage causing pollution. A virtually identical incident at the farm in 1984 had caused a major fish mortality.

Slurry spreading

On the 16th of June 1995 at Sickergill Farm, Renwick, near Penrith, a discharge of cattle slurry into the Raven Beck, a tributary of the Eden, caused a fish mortality. The incident occurred whilst the farmer was spreading slurry onto fields. In order to liquefy the slurry in the above ground slurry store, liquid was circulated between a small below ground tank and the main store. The pump lifting liquid back into the store failed whilst unattended and the contents of the store drained to the pit which rapidly overflowed, discharging to the beck about 100m away. The *Code of Good Agricultural Practice for the Protection of Water* (see references), recommends that pumps should not be left running whilst unattended. Approximately 4,000 trout died as a result of the high concentration of ammonia and lack of oxygen.

Although the farm staff were aware of the incident and rectified the mechanical breakdown, they failed to report the problem to the NRA. A member of the public subsequently notified the NRA and immediate action was then taken to try to limit the impact and protect fish downstream. This emphasises the need for prompt reporting, as it might have been possible to take remedial measures earlier and to have reduced the impact of the incident.

FJ & EM Mason & Son were subsequently prosecuted. They were fined £2,000 and ordered to pay costs of £2,400 plus compensation of £3,459 for restocking the beck with fish.

2.1.2 Sewage Treatment

Failure of automated control and alarm system

During a storm on the night of the 10th of July, an illegal discharge of raw sewage was made from Severn-Trent Water plc's Barnhurst sewage treatment works into the Staffordshire and Worcester Canal. This depleted the level of dissolved oxygen and increased the ammonia concentration, causing the deaths of more than 16,500 fish despite a major fish rescue mounted by NRA staff.

The discharge occurred as a result of an electrical storm causing the computer controlling the cleaning of the inlet screens at the sewage works to fail. This allowed debris to accumulate on the inlet screen, blocking the inlet and causing an overflow of raw sewage to the canal. The computer also controlled

the alarm systems at the works and Severn-Trent Water were not aware of the incident until alerted by NRA staff. The incident resulted in a £17,000 fine and over £4,000 clean-up costs for the company.

The water industry has greatly reduced staff numbers at operational sites in recent years. As a result, increasing reliance has been placed on automation and telemetry for routine operations and alarms. Unfortunately, in cases such as this, where the control and alarm systems fail, the lack of staff on site means that operators may not be aware that pollution is occurring. Telemetry of key operational parameters to manned control rooms is regarded as vital and we are continuing to press for such provisions and for the incorporation of failsafe features.

2.1.3 Industrial

Ferrous sulphate tank failure

On Friday the 10th of February 1995 a catastrophic failure of a 5 metre high glass reinforced plastic (GRP) storage tank containing ferrous sulphate solution occurred at Harcros Pigments at Milton Keynes. The force caused by the instantaneous loss of approximately 90,000 litres of liquid from the tank demolished a length of double wall (12m long by 3.3 m high) behind the tank. The failure also fractured the pipework to the adjacent tank and a further 90,000 litres were lost. The majority of the ferrous sulphate went through the site car park and the adjoining public house car park before entering the Deanshanger Brook. However, some entered the foul sewerage system and this was diverted to storm tanks at the sewage treatment works.

Extremely heavy rainfall had resulted in a high flow in the brook and attempts to dam the system were abandoned. A downstream public water supply intake at Clapham, on the River Great Ouse, was closed as a precaution although chemical monitoring indicated minimal effects due to the very high dilution. The incident demonstrates the need to take into account the enormous forces which can occur if a storage tank fails. This should be addressed in the design of bund walls and containment systems

Hydrochloric Acid Spill

At 10 minutes to midnight on the evening of the 16th of July 1995 the East Sussex Fire Service requested assistance from the NRA in dealing with a spillage of hydrochloric acid at a factory in Hailsham, near Eastbourne. A pollution officer arrived on site within 40 minutes. The officer found that the acid had leaked from a tank following a delivery and was contained within a bund wall, which was three quarters full. Acid fumes were drifting towards a housing estate and the Fire Service were anxious to try to prevent this using foam. By 2 a.m. the acid was starting to leak through the bund wall and within an hour had reached a tributary of the River Cuckmere via a surface water sewer. The pH in the stream was recorded as between 0 and 1. The local water company assisted by providing a supply of lime which was used in the stream to neutralise the acid. Subsequent inspection of the bund showed that the protective internal coating was damaged, allowing the acid to come into contact with the fabric of the bund. The incident illustrated the need for bund walls around chemical storage tanks, the importance of ensuring that the bund is resistant to the material stored and the need for regular inspections of the bund to ensure it remains sound. In this case, because the internal protective coating of the bund was ineffective, the acid attacked the material of the bund and escaped to the stream, where it caused serious environmental harm.

The owners of the site, Chemaide, were subsequently prosecuted and pleaded guilty to a charge of causing pollution. A fine of £1,000 was imposed, in addition to the substantial costs incurred in dealing with the incident.

Road Construction

A series of pollution incidents involving the discharge of silty water occurred during the construction of the M65 Blackburn by-pass during 1994 and 1995. Following a complaint in April that the River Lostock at Leyland had been brown for three days the source was traced to a pump dewatering the base of a new concrete structure. Although the water being pumped was clear, it was disturbing silt in the pipework running to the river.

A second incident was investigated on the 12th July when it was found that the ingress of groundwater into a recently constructed surface water system had flushed out accumulated silt from the site. Although there was an oil separator on the system which acted to settle out some silt, it was full when checked.

In both cases the company did not appear to be monitoring discharges from their site or to be aware of their impact. Road construction projects are particularly complex, with river and stream crossings and large areas of exposed soil, and the discharge of silt is a common problem. It is therefore essential that those involved in such projects take every precaution to prevent any such discharge and to ensure that the project management includes monitoring and control of off-site discharges.

Golf Course Earthworks

A routine inspection of construction activity at a new golf course in Berkshire revealed a dewatering discharge via two large pumps into a tributary of the Thames. The area was being excavated to form a reservoir for irrigation water for the course. No precautions had been taken to prevent the discharge or to provide settlement facilities, even though land and lagoons were available. This emphasises that any construction activity involving ground clearance, excavation or the pumping of water has the potential to cause pollution if proper measures are not considered at the planning stage and complied with during construction. The contractor was subsequently prosecuted and fined £1,000.

2.1.4 Transport

Milk Tanker

In June 1995 a milk tanker travelling along the A69 west of Newcastle suffered a tyre blow-out. As a result the valve on the outlet pipe was fractured and 22,000 litres of milk were spilled to the highway drainage system discharging to a tributary of the Tyne. Milk is highly polluting because it is so readily broken down by naturally occurring bacteria. This rapidly removes the dissolved oxygen present in river water, killing fish and invertebrates alike.

NRA staff were quickly on the scene and the stream was dammed to contain the spillage. Submersible pumps and a vacuum tanker were used to remove the milk, which was spread on to nearby land by a local farmer. The operation took three days but as a result of the clean-up serious environmental damage was avoided. Without the remedial action a large number of fish, including salmon, would have been killed.

Since this incident the tanker company has redesigned the outlet pipe to prevent a recurrence. Although the company involved were not prosecuted for this incident they did have to pay £4,000 for the clean-up work.
Major incidents involving the spillage of milk from road tankers also occurred in the Welsh, Severn-Trent, Southern and South Western Regions of the NRA.

Petrol Tanker

Whilst negotiating a roundabout at Junction 21 of the M4 near the Severn Bridge on the 1st June 1995, a petrol tanker toppled over onto its side rupturing two of its six compartments. Unfortunately the partitions between the compartments were also damaged and the entire contents of the tanker (34,000 litres of petrol and 5,000 litres of diesel) were lost. Staff from the company's depot and the Fire Service were on site very quickly. Because of the explosive nature of the mixture the Fire Service applied a blanket of foam.

A pollution control officer arrived on site within 45 minutes. The drainage system discharged to a retention pond where much of the fuel had accumulated. However, the pond overflowed to a culverted stream and the fuel was already discharging into it. This had not been apparent to those on site as the outfall was obscured. On the advice of the pollution officer the pond outlet was blocked and the stream dammed off. Arrangements were made for an NRA flood defence gang to assist and to supply adsorbent materials. The tanker operators removed the fuel and the contaminated water from the pond over the next two days. Arrangements were also made to remove most of the contaminated silt and vegetation.

Following the accident the response of the oil company was prompt and efficient. However, it might have been possible to retain all the fuel in the retention pond had those attending known there was an outlet. There is currently no standard form of notice to use on such sites to advise the emergency services as to how they operate. This is now the subject of discussion with the Highways Agency.

Rail Tanker

On the 4th of January 1995 a train of 14 fuel wagons containing diesel fuel oil was derailed at Sandiacre in Nottinghamshire. Three of the wagons overturned, resulting in damage to the delivery pipework and automatic cut-off valves, allowing diesel to escape to the surrounding land. Pollution Control staff attended the scene immediately.

The site of the accident was only 200 metres from the River Erewash and upstream of a Site of Special Scientific Interest (SSSI). Although there was no immediate evidence of the fuel reaching the river, NRA flood defence operatives installed oil booms at strategic points. Two and a half hours after the incident oil was found to be discharging to the river. A trench was excavated on the site to intercept the flow of the oil through the soil. A land drain, which was picking up the oil, was located and an interceptor pit constructed to contain the oil overnight.

It was estimated that at least 45,000 litres of fuel were lost and over a period of days approximately 1,300,000 litres of mixed oil and water were pumped into empty fuel wagons and removed from the site. A Railtrack enquiry identified that the track had fractured as the train passed over it, causing the derailment. The engine was found to have been

exceeding the 20 mph speed restriction on the track, exacerbating the damage on derailment and the subsequent environmental impact.

As a long term solution Railtrack have installed a purpose built oil separator to retain oil from the groundwater around the incident site. Costs incurred by Railtrack in resolving the incident were estimated at £500,000. Both British Rail and Railtrack were prosecuted and pleaded guilty at Ilkeston Magistrates Court and were each fined £15,000. NRA costs in excess of £29,000 are to be recouped by a civil action.

2.1.5 Other Incidents

Urban Run-off

A number of thunderstorms occurred over Birmingham and the Black Country on the 10th of July 1995 following six weeks of dry weather. The heavy rainfall washed the accumulated silt, debris and standing water from the extensive urban drainage systems in the area into the River Tame. This material had a high organic content and caused a rapid depletion of dissolved oxygen in the river, resulting in the death of thousands of fish. An extensive "plug" of deoxygenated water moved down the Tame into the Trent, causing further fish to die.

A major exercise was mounted over a period of three days to protect the coarse fish in the Trent. NRA staff injected oxygen into the river at a number of points, three downstream power stations' cooling towers were utilised to increase the re-aeration of the river and Severn-Trent Water plc assisted by ceasing abstraction at Egginton, allowing an increase in clean water flowing down river. These actions enabled the oxygen levels to recover and prevented the death of any more fish.

3 Pollution Prevention

3.1 The co-operative approach

Throughout 1995 the NRA has endeavoured to establish new links with industry and other regulators whilst building on existing relationships.

One example of such co-operation, the Oil Care Campaign, was launched in January 1995 as a result of the NRA's concern over the ever increasing number of oil pollution incidents. It has generated a very positive response from the oil industry and from local authority recycling officers. The campaign aims to educate all users of fuels and oil, both individuals and industry, in its safe storage and disposal. The petroleum industry has been very supportive of the campaign and many production and distribution companies have supplied NRA information to their industrial and commercial customers directly or through company magazines. An information service for the public that advises on the location of oil recycling facilities, the Oil Bank Line (0800 663366), has been established by the NRA. Over 3,000 calls were received in the first year, and the number has now been included on the packaging for retail motor oil by most of the major companies. Financial contributions to the cost of running the service have been made by Gulf, Castrol, Mobil, Shell, BP and the British Lubricants Federation. Local authority recycling officers have provided information on the location of the facilities for the database. Information on used oil disposal and the Oil Bank Line is also now being included at appropriate points in the Haynes series of car manuals.

A similar joint approach to pollution prevention followed a number of pollution incidents involving garages. The assistance of the Retail Motor Industry Federation was sought in the drafting of Pollution Prevention Guidance dealing with garages and other motor vehicle servicing sites. Not only did the Federation assist with the drafting of the Guidance Note, but they also promoted and distributed it to 16,000 members through their magazine, Motor Retailer.

Collaboration between the NRA and the National Association of Waste Regulation Officers in 1995 resulted in a joint guidance document on the spreading of waste to land and to a draft guidance note on metal recycling sites.

3.2 Other Initiatives

3.2.1 Agricultural

The possible use of buffer zones to reduce the impact of agricultural activities on watercourses was highlighted in the 1994 incident report following a pesticide incident on the Isle of Wight. Work in Europe and North America has shown benefits for conservation and water quality from buffer zones but there is no consensus in the UK on what such a zone is and what benefits its use may have. The NRA initiated field research to assess the practical performance of such zones in reducing the impact of diffuse pollution from various agricultural activities. A detailed information booklet on buffer zones is due for publication in 1996.

Pollution incidents related to land run-off are increasing, in part as a result of the increased use of automatic irrigation systems to spread slurry but mainly due to poor planning for and management of farm wastes. The NRA took a number of initiatives to combat the problem, including the active promotion of the use of farm waste management plans. The launch in 1995 by the British Institute of Agricultural Consultants of a register of competent consultants, the National Farm Waste Management Register, was welcomed by the NRA as being of assistance to all who are involved, especially farmers. The NRA were closely involved in the development of standards for farm waste management plans and guidance was produced to help both NRA staff and those preparing plans to meet the requirements.

Other initiatives include research projects to study waste minimisation on farms, Integrated Crop Management and farming systems and a project to produce an emergency action plan for use on farms which will be distributed as an insert in *Farmers Weekly*. This is being carried out in association with LEAF (Linking Environment and Farming), FMA (Fertilizers Manufacture Association), BAA (British Agrochemicals Association) and *Farmers Weekly*.

3.2.2 Sewage Pollution

Sewage pollution continues to account for a significant proportion of all incidents (26%). Under the investment programme agreed in 1994 ("Asset Management Plan 2") between the Water Service PLC's (WSPLC's), the Office of Water Services (Ofwat) and the NRA, significant investment in sewerage and sewage treatment will be made between 1995 and 2005. Much of this expenditure will focus on achieving compliance with European Directives. However, there is some allowance for discretionary expenditure for environmental improvement and the NRA has been working with the WSPLC's to ensure that the most effective use is made of this.

3.2.3 Construction Industry

The 1994 incident report highlighted the construction industry as the largest industrial sector source of water pollution incidents. These incidents usually involve the discharge of silt or oil, and in the majority of cases pollution is avoidable. Efforts are being made to help the industry identify what can be done to improve matters. A training video for construction workers is being produced by the Environment Agency, working with the Construction Industry Research and Information Association (CIRIA) and representatives from the industry itself. The video identifies the causes of water pollution from construction sites and how it can be avoided. In addition, at the request of a number of construction companies the NRA provided assistance with in house staff training programmes.

3.2.4 Publications

One new pollution prevention guidance note was produced in 1995: *Preventing Pollution from Garages and Vehicle Service Centres* (PPG19). Two new leaflets were produced, one relating to the Oil Care Campaign - *Oil Care on Your Boat* - and the other, aimed at the construction industry: *Silt and its effect on the River.* These are available from the Environment Agency. A full list of pollution prevention materials is given in Appendix C.

3.2.5 River Dee Water Protection Zone Application

An application made by the NRA for the designation of the River Dee as a Water Protection Zone (WPZ) under the provisions of S.93 of the Water Resources Act went to Public Enquiry in March 1995. The Secretaries of State have not yet issued their decision. The application followed a series of serious incidents on this river which supplies water to 2 million people. The designation of the river as a WPZ would considerably strengthen the Environment Agency's powers to prevent pollution. The need for such powers is highlighted by the 307 pollution incidents (8 of which were Category 1) which occurred in the Dee catchment in 1995.

3.2.6 Pollution Prevention Initiatives within the NRA

A manual on pollution prevention for NRA staff was published in 1995. This provides a source of background information on pollution prevention, along with industry specific guidance notes. It will act as a means for communicating experiences, as each section is written by a specialist in the field and it will harmonise the approach taken in pollution control work. In addition, progress is being made in better definitions of the work involved in pollution prevention in order to ensure that it is properly resourced and included within business plans. In past years it has been all too easy to overlook the importance of proactive pollution prevention work whilst dealing with the growing number of pollution incidents.

The 1995 National Audit Office report on the NRA identified the need for good pollution prevention and pollution incident information. Work on a Pollution Prevention Database was put in hand in the Autumn of 1995 and the system is being phased in during 1996. The need for a nationally consistent pollution incident database remains. However there has been progress, with the number of systems in use reduced and improvements made to those remaining.

The NRA itself has large operational responsibilities and a significant number of sites. These sites have been audited by our own staff in order to identify any facilities which pose an unacceptable risk of pollution and a programme of work has been put in place to ensure that our own sites meet the highest standards. Follow-up inspections are undertaken to ensure that appropriate measures have been taken to minimise risks.

3.2.7 Groundwater protection

The NRA's work on its policy for the protection of groundwater from pollution was recognised in 1995 by the award of the Chartered Institute of Water and Environmental Management's first Centenary Award for an outstanding contribution to the protection of the aquatic environment. The NRA's *Policy and Practice for the Protection of Groundwater* was published in 1992 and a programme of producing groundwater vulnerability maps is under way. When used with the Policy document the maps are valuable, in both planning and pollution prevention, in indicating the areas where groundwater is most at risk. There will be 53 maps

in the series which is due to be completed in early 1998. Fourteen new maps were produced in 1995, bringing the total available to 22.

3.2.8 Waste Minimisation

The NRA has played an active role in a number of waste minimisation projects, following the Aire and Calder scheme and Project Catalyst which demonstrated that waste minimisation has positive financial as well as environmental benefits.
A number of smaller, local initiatives have been supported by the NRA throughout England and Wales. Each of these builds on the lessons learned in the demonstration projects whilst adapting their objectives to meet the local circumstances. The promotion of waste minimisation is a key area where the Environment Agency will be working with industry to promote sustainable development.

3.2.9 Liaison with the Fire Services

The vital work of the Fire Service in the management of major incidents was recognised in the Memorandum of Understanding signed between the NRA and CACFOA (Chief and Assistant Chief Fire Officers Association) in 1993. Since then the NRA has worked with the Fire Services, providing training and equipment for use in incidents for the control and prevention of pollution. As a consequence, Fire Officers and crews are much more aware of the risk of pollution and how it can be managed. The equipment which has been provided ranges from simple "grab packs" (containing adsorbent and sealing materials) for use on all fire tenders, to specialist equipment such as pumps, drain blockers and collapsible storage tanks for use on back-up tenders. There have been several major incidents where pollution has been avoided as a consequence of this joint effort.

3.2.10 Other Industry Initiatives

A joint NRA/Electricity Industry operational code relating to fluid filled electricity cables was completed at the end of 1995 and is now in place. This aims to ensure that the environmental impact of any fluid loss from such cables is minimised.
As a result a number of the Electricity Companies have undertaken surveys of their fluid filled cables and London Electricity have begun a three year refurbishment programme to halve the loss of fluid from its cables. An operational code relating to all Railtrack operations is close to completion.

Royal Mail approached the NRA in 1995 for information on the Oil Care Campaign and pollution prevention in general. As a result they have decided to undertake an audit of all their sites to identify what pollution risks exist and what steps are necessary to minimise them. This exemplifies the planned approach to pollution prevention which the NRA wishes to promote. Pollution risks should be identified and a programme of action drawn up, identifying priorities and establishing a planned investment in remedial works to minimise risk.
A similar survey and programme of improvements instigated by J. Sainsbury plc in 1994 at it's stores is now being extended to distribution depots and Homebase stores.

Industrial estates inevitably pose a risk to the environment and many pollution incidents arise from industrial units on such estates. The need to identify and apply best practice in the management of industrial estates with regard to the environment was identified in 1995 by Business in the Environment (BiE), a charitable trust supported by industry and the Prince's Trust. A joint project involving BiE, the NRA, Slough Estates and local water companies and councils has been established and guidance should be published in late 1996.

3.3 Pollution prevention in the Environment Agency

Much progress has been made in the field of pollution prevention since the NRA was created in 1989. There has been a shift of emphasis from enforcement action following pollution incidents towards more proactive pollution prevention work, based upon an analysis of the causes of pollution incidents. This has involved a joint approach with companies, trade associations and similar bodies, working together to develop clear, practical guidance. Such work will play an increasingly important role in reducing the risks of pollution occurring and the Agency has already made a commitment to providing high quality environmental protection and improvement, with an emphasis on prevention and education backed up with firm enforcement where necessary.

4 Analysis of Incidents

4.1 All reported incidents

During the calendar year of 1995, 35,891 pollution incidents were reported to the NRA, an increase of 4% on 1994. In each case every effort was made to substantiate reports received from the public, and to identify the cause and nature of the incident. In 1995 23,463 incidents (65% of those reported) were substantiated, that is, evidence was found that a pollution incident had occurred. Of these incidents 199 were classified as Category 1 (for definition of incident categories, see Appendix 1).

Prior to and including 1990, only data for reported incidents were available. To maintain continuity, Figure 1 shows reported incidents from 1985 to 1995 in England and Wales. The remainder of the report is based on substantiated incidents only.

4.2 Regional distribution

The regional distribution of the 23,463 substantiated pollution incidents in 1995 is illustrated in Figure 2.

South Western Region had the most incidents (19% of the total) and Southern Region the smallest number (5%). 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 1994 in all but the North West and South Western regions. In both of these regions there was a notable increase in the number of pollution incidents from industry and the sewage and water industry.

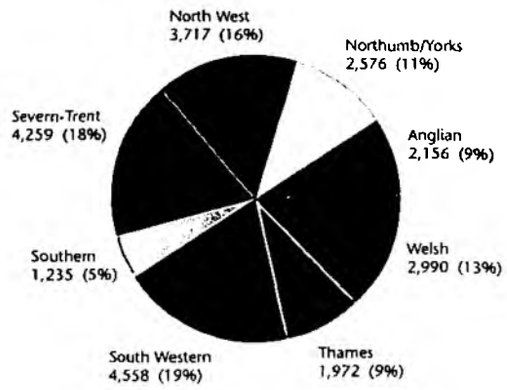


Figure 2
Total number of substantiated pollution incidents by NRA Region, 1995

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

4.2.1 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 and Crown exempt sites and incidents where the source was not traced.

The greatest proportion of incidents arose from the Sewage and Water Industry (30%).

Figure 1
Total number of pollution incidents in England and Wales, 1986-1995

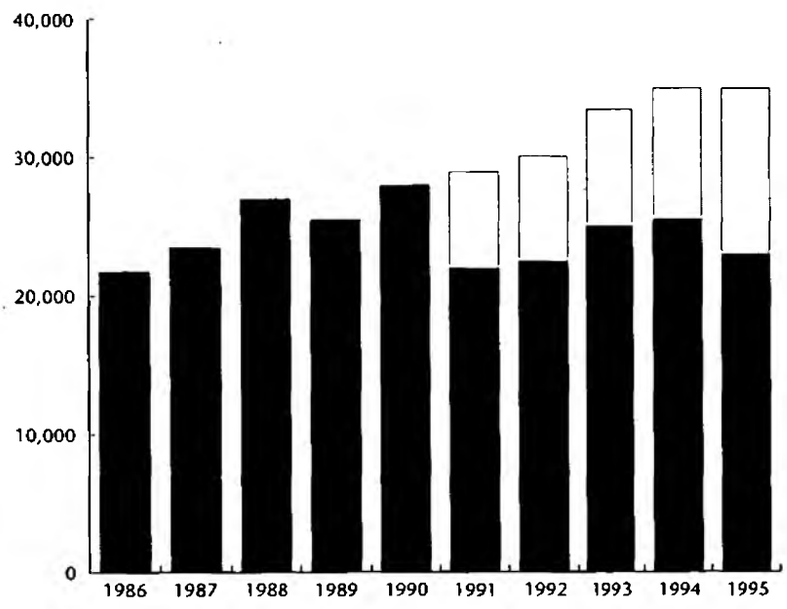
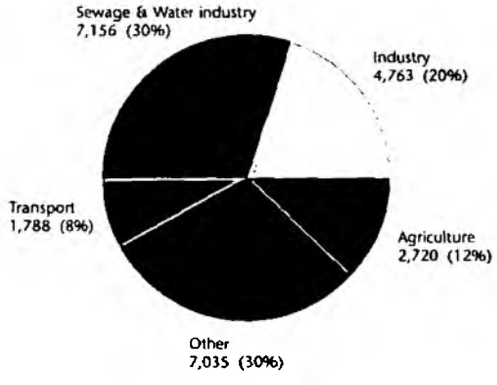


Table 1
Total number of reported pollution incidents in 1995 by incident category

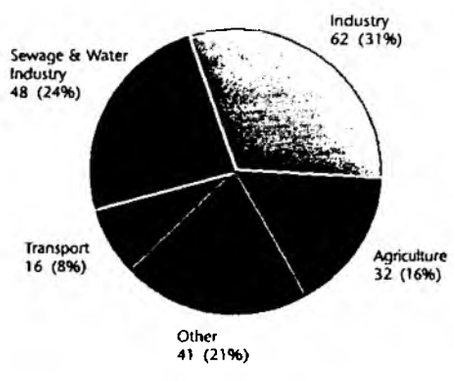
NRA Region	Substantiated			Total substantiated	Category 4 (Unsubstant'd)
	Category 1	Category 2	Category 3		
Anglian	15	321	1,820	2,156	1,260
Northumbria & Yorkshire	36	276	2,264	2,576	1,788
North West	28	429	3,260	3,717	1,297
Severn-Trent	28	338	3,893	4,259	2,051
Southern	12	70	1,153	1,235	1,154
South Western	35	385	4,138	4,558	1,417
Thames	12	153	1,807	1,972	2,005
Welsh	33	222	2,735	2,990	1,455
TOTAL	**199**	**2,194**	**21,070**	**23,463**	**12,427**

Table 2
Total number of substantiated pollution incidents by source, 1995

NRA Region	Agricultural	Industrial	Sewage & Water	Transport	Other source	Total	%
Anglian	212	399	557	216	772	2,156	9
Northumbria & Yorkshire	220	539	1,013	129	675	2,576	11
North West	312	948	1,223	221	1,013	3,717	16
Severn-Trent	371	749	1,175	283	1,681	4,259	18
Southern	123	239	328	174	371	1,235	5
South Western	975	711	1,469	337	1,066	4,558	19
Thames	115	330	487	217	823	1,972	9
Welsh	392	848	905	211	534	2,990	13
TOTAL	**2,720**	**4,763**	**7,157**	**1,788**	**7,035**	**23,463**	**100**
Percentage %	12	20	30	8	30	100	



All incidents



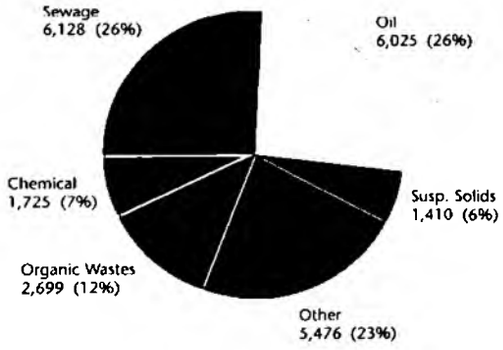
Category 1 incidents only

Figures 3a and 3b
Distribution of substantiated pollution incidents by source, 1995

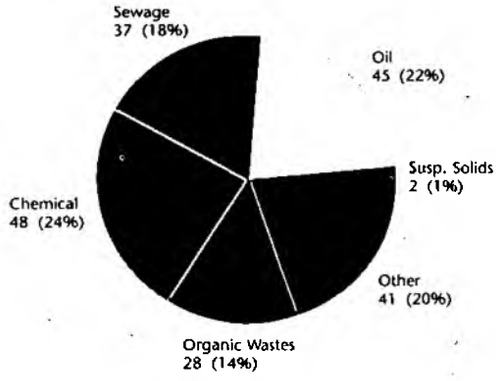
4.2.2 Distribution by type of pollutant

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

Figures 4a and 4b ***Distribution of substantiated pollution incidents by type, 1995***



All incidents



Category 1 incidents only

The largest number of pollution incidents by type were caused by "other" pollution types, (29%), followed by sewage and fuels and oils (26% each). Natural causes (in the "other" category) accounted for 4% of all incidents. This is typical of a long dry summer when low flows, low dissolved oxygen and algal blooms are more common. Inert suspended solids accounted for the largest number of incidents in the "other" category - 6% of the total number of substantiated incidents - and are therefore shown separately in Figures 4a and 4b. More information is shown in Table 3 and in Figures 4a and 4b.

4.2.3 Category 1 incidents

Only 199 incidents (less than 1%) of the total of 23,463 were identified as Category 1. The number of major incidents has decreased significantly during the 6 years of the NRA. 386 major incidents were recorded in 1991 and so the 1995 figure represents a 48% reduction. Part of this decrease is probably due to the improved categorisation of incidents. However, after its creation in 1989 the NRA greatly increased the profile of pollution incidents and pollution prevention. Prosecution for pollution offences can be costly and creates bad publicity and as a result many companies now have environmental policies, emergency plans and better pollution prevention facilities.

Tables 4 and 5 show the number of Category 1 incidents by source and type in 1994 and 1995. Figure 3b shows the proportion of Category 1 incidents from the five sources. Industry caused the largest number of Category 1 incidents. The largest numbers of Category 1 incidents by type were due to chemicals (24%) and oils and fuels (22%). See Figure 4b.

Table 3 ***Total number of substantiated pollution incidents in 1995 by type of pollutant***

NRA Region	Organic wastes	Fuels & oils	Sewage	Chemicals	Other types	Total	%
Anglian	201	734	547	201	473	2,156	9
Northumbria & Yorkshire	183	668	825	140	760	2,576	11
North West	408	828	1,103	359	1,019	3,717	16
Severn-Trent	419	1,197	935	317	1,391	4,259	18
Southern	84	470	351	108	222	1,235	5
South Western	899	909	988	302	1,460	4,558	19
Thames	75	780	507	174	436	1,972	9
Welsh	430	439	872	124	1,125	2,990	13
TOTAL	**2,699**	**6,025**	**6,128**	**1,725**	**6,886**	**23,463**	**100**
Percentage %	12	26	26	7	29		

Table 4
Total number of Category 1 (Major) substantiated pollution incidents by source, 1994 and 1995

NRA Region	Agricultural		Industrial		Sewage & Water		Transport		Other sources		Total		%	
	94	95	94	95	94	95	94	95	94	95	94	95	94	95
Anglian	1	1	2	5	2	7	0	0	7	2	12	15	5	8
Northumbria & Yorkshire	5	7	10	13	13	10	2	2	8	4	38	36	17	18
North West	8	6	17	10	13	7	1	1	6	4	45	28	20	14
Severn-Trent	8	2	20	10	15	6	2	4	18	6	63	28	28	14
Southern	2	3	1	6	0	1	0	1	2	1	5	12	2	6
South Western	9	6	9	8	6	7	6	1	7	13	35	35	16	18
Thames	1	0	1	2	2	6	1	2	0	2	5	12	2	6
Welsh	2	7	15	8	3	4	2	5	2	9	24	33	10	16
TOTAL	36	32	75	62	54	48	14	16	50	41	227	199	100	100
Percent %	16	16	33	31	24	24	6	8	22	21	100	100		

Table 5
Total number of Category 1 (Major) substantiated pollution incidents by pollutant type, 1994 and 1995

NRA Region	Organic wastes		Fuels & Oils		Sewage		Chemicals		Other type		Total		%	
	94	95	94	95	94	95	94	95	94	95	94	95	94	95
Anglian	2	1	1	3	2	3	4	7	3	1	12	15	5	8
Northumbria & Yorkshire	5	5	4	10	11	11	7	6	11	4	38	36	17	18
North West	9	7	9	7	10	6	10	5	7	3	45	28	20	14
Severn-Trent	4	1	10	8	22	5	16	8	11	6	63	28	28	14
Southern	0	3	1	3	0	1	3	4	1	1	5	12	2	6
South Western	12	4	8	7	5	4	7	7	5	13	37	35	16	18
Thames	1	0	1	2	1	4	2	5	0	1	5	12	2	6
Welsh	3	7	6	5	1	3	3	6	11	12	24	33	10	16
TOTAL	36	28	40	45	52	37	52	48	49	41	229	199	100	100
Percent %	16	14	17	22	23	18	23	24	21	21	100	100		

In 1995 the NRA dealt with six Category 1 incidents (3%) where pollution was prevented due to the pollution control work of the NRA and other agencies. For example in Thames Region the quick action of the NRA, the Fire Services and the Local Authority prevented a tanker-load of liquid sugar from entering the River Roding.

5 Analysis of Incidents by Source

5.1 Agricultural pollution incidents

5.1.1 Total incidents

In 1995 2,720 substantiated pollution incidents arose from agricultural sources, accounting for 12% 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 (40%), followed by beef farming (7%), mixed farming and pig farming (6%) and arable farming (5%).

5.1.3 Agricultural fuel oil incidents

A significant source of pollution not included in the table above is that of 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. Although there has been a fall in the overall number of fuel and oil pollution incidents, this is not reflected in the agricultural sector, where the number of incidents has risen from 156 in 1994 to 174 in 1995. This is considerably more than in 1990, prior to the introduction of the regulations, and indicates an area where further pollution prevention action may be required.

5.1.4 Historical trends

Table 6 also shows the number of pollution incidents in each NRA region from 1989 to 1995. The figure of 2,720 agricultural pollution incidents is the lowest since the formation of the NRA.

Compared with the 1994 figures, the number of agricultural pollution incidents declined in every region except Thames. The overall proportion of incidents from agricultural sources declined slightly from 13% to 12%.

5.1.5 Category 1 incidents

Category 1 incidents declined significantly between 1991 and 1995, from 99 incidents to 32. During this period both the NRA and the Ministry of Agriculture, Fisheries and Food (MAFF) worked to encourage farmers to protect the water environment. Prior to 1991 the statistics were based on the MAFF definition of a serious incident, which has a wider definition, and so direct comparison is not possible.

A breakdown of Category 1 incidents is shown in Figure 6. The largest number of Category 1 incidents came from dairy farms (53%) and "other" agricultural sources (19%)

Figure 5 Substantiated agricultural pollution incidents by source, 1995

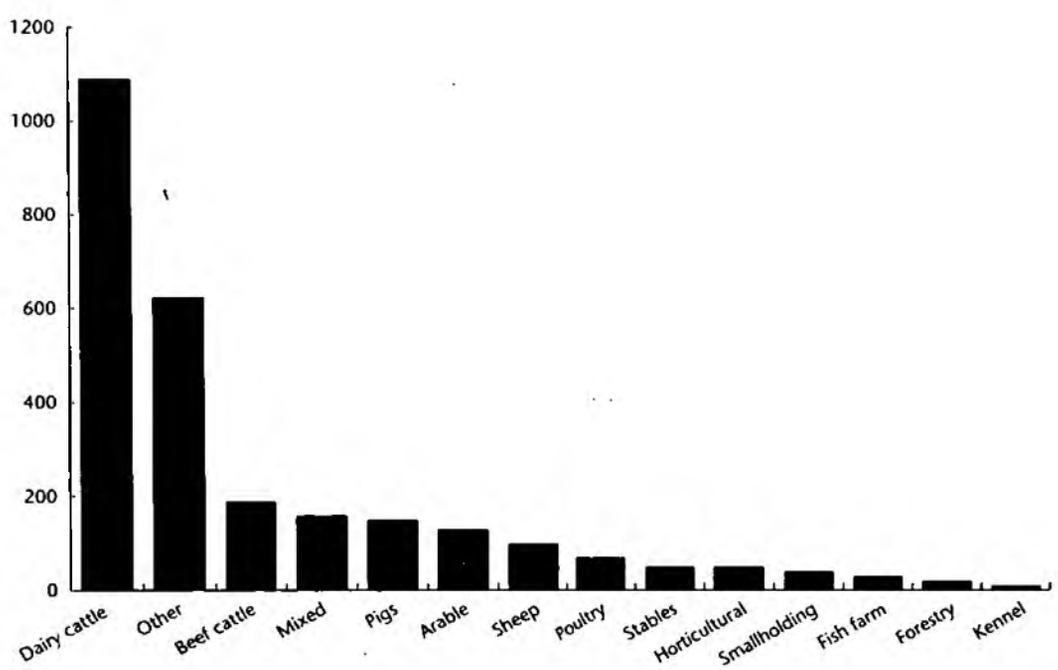


Table 6
Total agricultural pollution incidents by NRA Region, 1989-1995

NRA Region	1989		1990		1991		1992		1993		1994		1995	
	R	S	R	S	Sub	C1	Sub	C1	Sub	C1	Sub	C1	Sub	C1
Anglian	204	23	179	-	212	3	283	3	356	0	326	1	212	1
Northumbria & Yorkshire	332	29	370	45	343	22	231	6	148	7	396	5	220	7
North West	468	89	630	140	469	10	417	10	403	11	403	8	312	6
Severn-Trent	431	44	271	46	402	27	320	17	391	15	409	8	371	2
Southern	80	13	84	12	93	3	71	1	68	0	126	2	123	3
South Western	895	250	1,008	222	936	28	911	20	943	24	1,025	9	975	6
Thames	125	7	58	978	2	91	0	132	2	100	1	115	0	
Welsh	354	67	547	134	421	4	446	10	442	4	544	2	392	7
TOTAL	**2,889**	**522**	**3,147**	**608**	**2,954**	**99**	**2,770**	**67**	**2,883**	**63**	**3,329**	**36**	**2,720**	**32**

R = Reported S = Serious C1= NRA Category 1 Sub = Substantiated

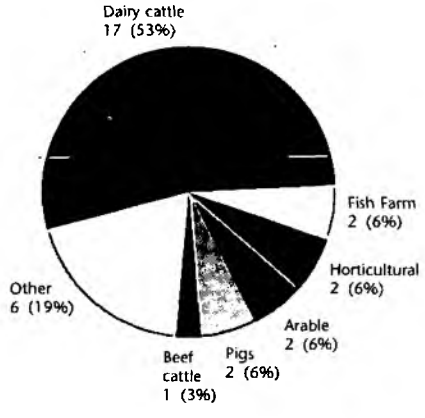


Figure 6
Substantiated Category 1 agricultural pollution incidents by source, 1995

5.2 Industrial pollution incidents

5.2.1 Total incidents

In 1995 4,763 pollution incidents from industrial sources were substantiated, 20% of the total.

5.2.2 Sources of industrial pollution

Figure 6 shows the main sources of industrial pollution incidents in 1995. 30% of these incidents could not be classified into the main sources and were placed in the "other" category. This compares with 47% of incidents in 1994 and illustrates some improvement in the recording of incident data. As in 1994, the construction industry was the most frequent polluter. In 1995 there were 790 such incidents, comprising 17% of industrial incidents and 3% of all incidents. The NRA took steps to control the number of pollution incidents from this source by initiating the production of a video targeted at pollution prevention on construction sites, which will be distributed by the Environment Agency (see Section 3.2.3). Other important sources were the chemical industry (8%), the food industry (8%), mining (7%) and landfill/waste disposal (5%).

5.2.3 Historical trends

The total number of substantiated industrial pollution incidents in 1995 was the lowest since 1992, and represents a 10% decrease on the figure for 1994. The number of incidents decreased most notably in Anglian Region (by 38%), Northumbria and Yorkshire Region (28%) and Welsh Region (by 18%). Minor increases occurred in South Western and North West Regions.

Direct comparison with previous years is difficult as no figures for substantiated incidents are available for 1988 and 1990 and the 1992 figure includes oil related incidents. However, the number of industry related pollution incidents rose by 70% between 1991 and 1995.

5.2.4 Category 1 incidents

Of the 199 Category 1 incidents, 62 (31%) arose from industrial sources. This represents a 17% decrease on 1994. Category 1 incidents represented only 1% of the total number of industrial pollution incidents. The largest number of Category 1 incidents was recorded in Northumbria Yorkshire Region (12), and the smallest in Thames Region (2).

Figure 7
Substantiated industrial pollution incidents by source, 1995

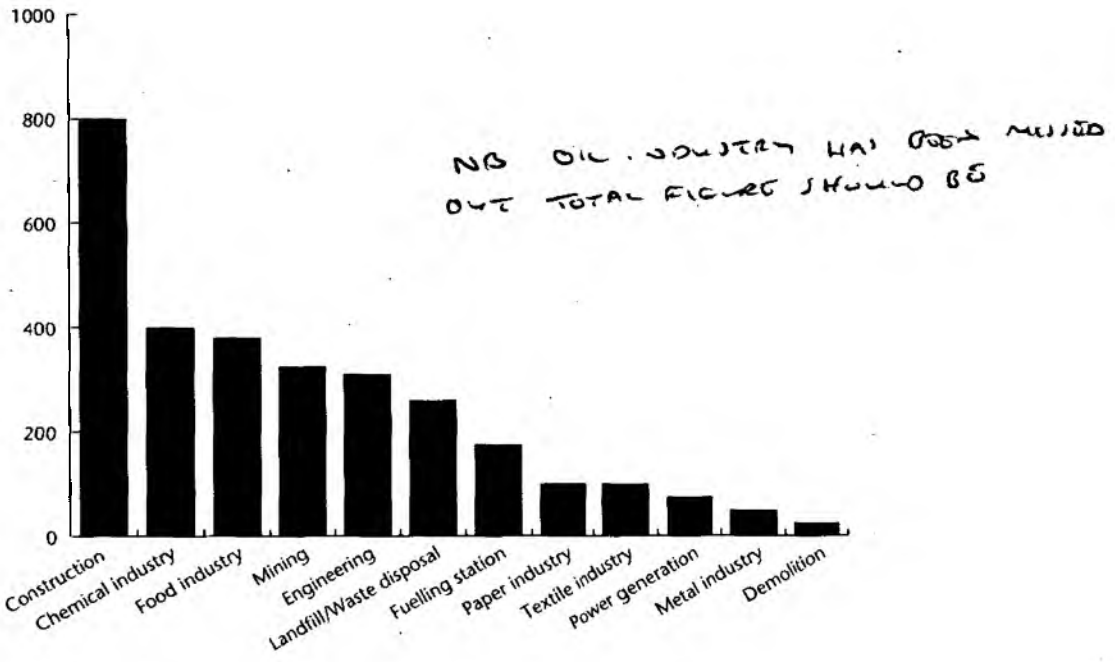


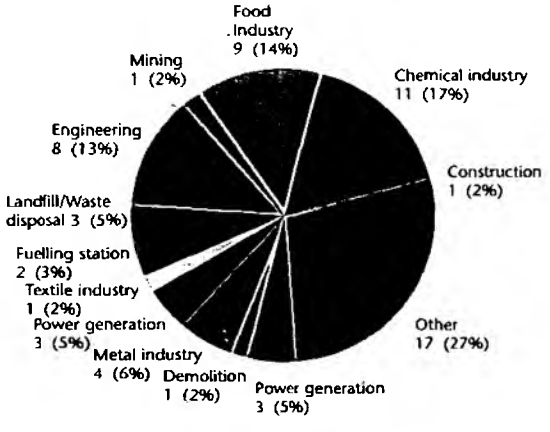
Table 7
Total industrial pollution incidents by NRA Region, 1988-1994

NRA Region	1988	1990	1991*	1992*a	1993*	1994 *	1995*
Anglian	169	213	94	584	601	635	399
Northumbria & Yorkshire	686	543	446	827	1,092	745	539
North West	338	267	336	279	1,335	821	948
Severn-Trent	1,108	350	608	715	727	769	749
Southern	182	164	168	236	203	262	239
South Western	501	742a	412	653	767	663	711
Thames	323	385	211	351	397	388	330
Welsh	353	138	428	864	880	1,026	848
TOTAL	3,660	2,802	2,803	4,509	6,002	5,309	4,763

Data for 1988 provided by previous Water Authorities

** Substantiated incidents a Includes oil related incidents*

Figure 8
Substantiated Category 1 industrial pollution incidents, 1995



A breakdown of Category 1 industrial pollution incidents is shown in Figure 8. The single biggest source of these incidents was the chemical industry (17%).

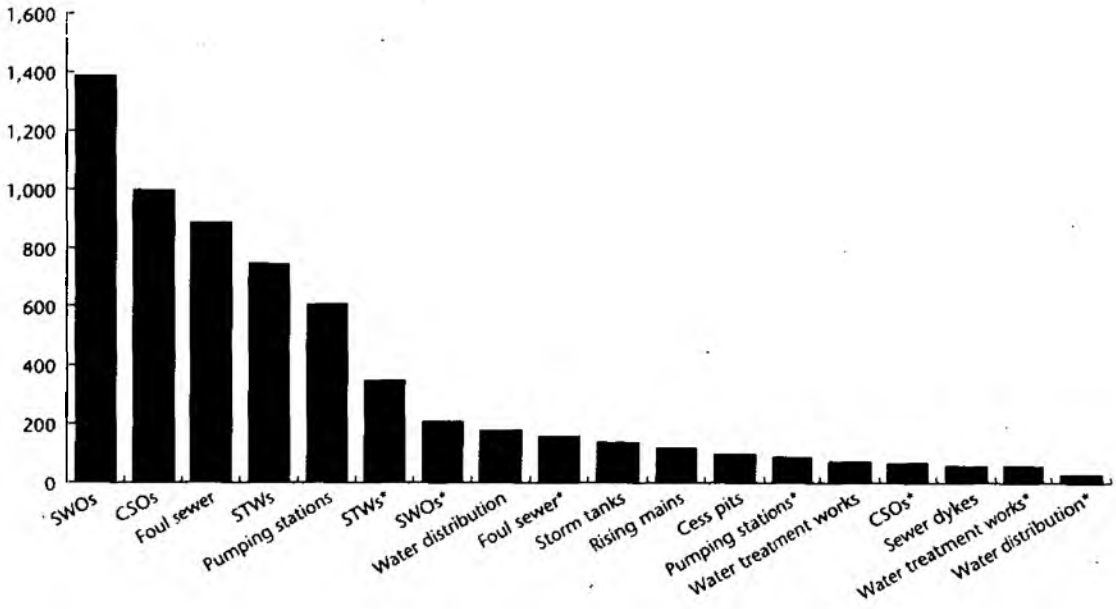


Figure 9
Substantiated sewage and water industry related pollution incidents by source, 1995

** Private sewage and water industry sources*

5.3 Sewage and water industry related pollution incidents

5.3.1 Total incidents

There were 7,157 substantiated sewage and water industry related pollution incidents in 1995: 30% 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 1995. As in previous years the biggest sources of pollution were water service company surface water outfalls (SWO's) and combined sewer overflows (CSO's), being responsible for 19% and 13% of incidents respectively. Other important sources included water service company foul sewerage systems (12%) and water service company sewage treatment works (STW's) (10%). The largest sources of private sewage and water industry pollution were STW's (5%) and SWO's (3%).

5.3.3 Historical trends

Table 8 gives the figures for the regional distribution of sewage and water related pollution incidents from 1988 to 1995. This shows an increase of 2% from 1994 to 1995, when incidents from all other sources (except transport) decreased. The greatest increases were recorded in South Western Region (22%), North West Region (19%) and Thames

Table 8
Total sewage and water industry related incidents by NRA Region, 1988-1990 and substantiated incidents 1991-1995

NRA Region	1988	1990	1991*	1992*	1993*	1994*	1995*
Anglian	373	362	570	657	586	714	557
Northumbria & Yorkshire	732	1,214	1,220	1,055	726	1,032	1,013
North West	614	968	986	1,051	1,066	1,028	1,223
Severn-Trent	772	424	1,329	961	1,327	1,337	1,175
Southern	345	487	376	446	227	393	328
South Western	656	874	925	1,019	1,124	1,209	1,469
Thames	610	765	416	373	421	414	487
Welsh	476	717	525	858	898	892	905
TOTAL	**4,578**	**5,811**	**6,347**	**6,420**	**6,375**	**7,019**	**7,157**

Data for 1988 provided by previous Water Authorities

** Substantiated incidents only*

Region (18%). The increase in South Western Region was due to a higher than normal level of complaints regarding sewage on beaches, and probably reflects the high number of tourists in the region due to the fine summer weather. Decreases were recorded in Anglian (by 22%), Northumbria and Yorkshire, Severn-Trent and Southern Regions.

The number of sewage and water industry related incidents rose by 56% between 1988 and 1995.

5.3.4 Category 1 incidents

Of the total number of sewage and water related incidents 48 (less than 1%) were classified as Category 1. This represents 24% of all Category 1 incidents as it did in 1994. 21% of these incidents were recorded in Northumbria and Yorkshire Region and 15% in both Anglian and North West Regions.

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

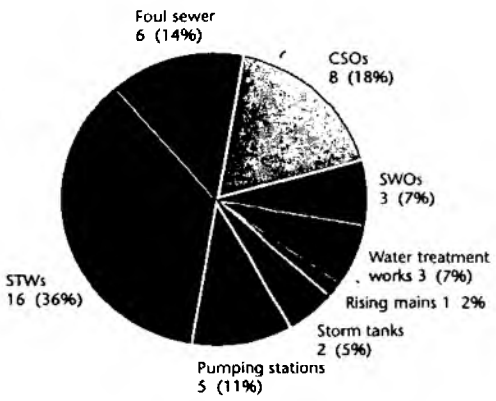


Figure 10
Substantiated Category 1 sewage and water related incidents, where classified, 1995

5.4 Transport pollution incidents

5.4.1 Total incidents

In 1995 1,788 transport related pollution incidents were substantiated, 8% of the national total.

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 majority originated from roads (73%), mainly as a result of road traffic accidents. Ships and boats were involved in 19% and long distance pipelines, railways and airports together accounted for 8% of transport incidents.

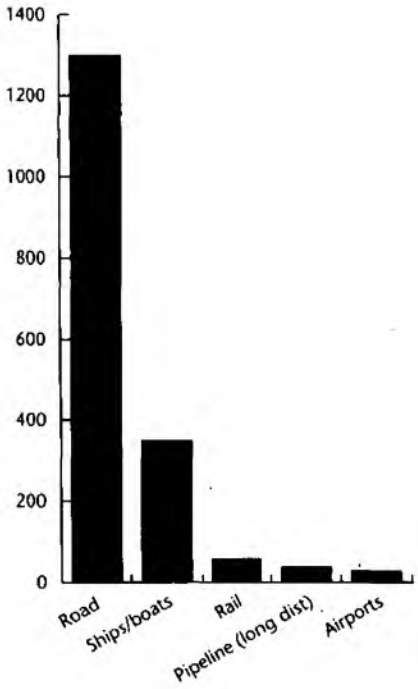


Figure 11
Substantiated transport related pollution incidents by source, 1995

5.4.3 Historical trends

The trend of transport incidents from 1993 to 1995 is shown in Table 9. There was an increase of five incidents on 1994. The largest increase in the number of transport incidents was in North West Region (by 81%). The number of incidents in Anglian Region declined by 45%.

Transport was reported separately for the first time in 1993. Between then and 1995, the number of transport related pollution incidents rose by 19%.

Table 9
Total substantiated transport pollution incidents by NRA Region 1993-1995

NRA Region	1993	1994	1995
Anglian	99	394	216
Northumbria & Yorkshire	146	166	129
North West	66	122	221
Severn-Trent	202	214	283
Southern	173	120	174
South Western	403	355	337
Thames	192	195	217
Welsh	217	217	211
TOTAL	**1,498**	**1,783**	**1,788**

5.4.4 Category 1 incidents

16 transport incidents were classified as Category 1 in 1995, 8% of the total. 75% (12 incidents) of these were from road transport. Two Category 1 incidents arose from boats, and one from a long distance pipeline (Welsh Region). There was one Category 1 rail incident, in Severn-Trent Region. Most Category 1 transport incidents occurred in Welsh Region (five) and Severn-Trent Region (four).

The sources of Category 1 transport pollution incidents are shown in Figure 12.

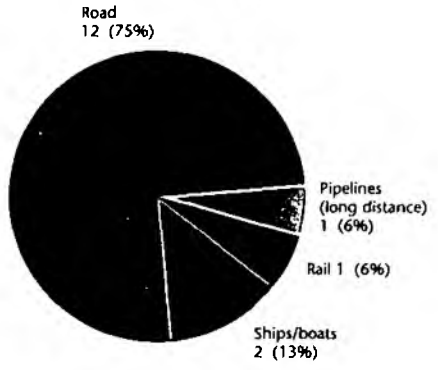


Figure 12
Substantiated Category 1 transport incidents, 1995

5.5 "Other" sources of pollution

5.5.1 Total incidents

In 1995 7,035 pollution incidents from "other" sources were substantiated, 30% of the total. In addition to those incidents where the source was traced but could not be otherwise categorised, this section includes pollution incidents which could not be traced.

5.5.2 "Other" sources of pollution

79% of "other" source pollution incidents could not be classified any further, including those where the source was not found. Domestic and residential premises accounted for 15% of these incidents, restaurants and public houses 2%, schools 1%,. Crown exempt premises 1%, contaminated land <1%, metal recycling sites <1% and hospitals <1%. These incidents are illustrated in Figure 13.

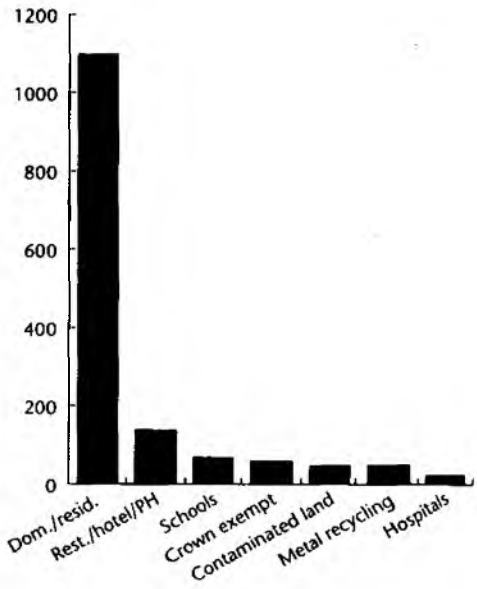


Figure 13
Substantiated "other" sources of pollution incidents, where classified, 1995

5.5.3 Historical trends

The number of "other" source pollution incidents declined by 12% between 1994 and 1995. This decline was most marked in Northumbria and Yorkshire Region (25%) and Severn-Trent Region (22%), where considerable efforts have been made to improve the recording of incident data.

NRA Region	1992*	1993	1994	1995
Anglian	938	983	750	772
Northumbria & Yorkshire	946	1,530	904	675
North West	1,523	786	1,158	1,013
Severn-Trent	2,424	2,229	2,166	1,681
Southern	336	684	415	371
South Western	1,695	892	1,088	1,066
Thames	1,140	929	909	823
Welsh	630	508	585	634
TOTAL	**9,632**	**8,541**	**7,975**	**7,035**

**Includes transport incidents*

Table 10
Substantiated "other" sources of pollution, by NRA Region, 1995

The "other" premises category included transport until 1992 and so direct comparison before 1993 is not possible. Between 1993 and 1995 the number of incidents classified as "other" declined by 18%.

5.5.4 Category 1 incidents

Of the 7,035 "other" source pollution incidents only 41 were classified as Category 1 - less than 1%. Of these 41, 21 could not be further classified and 17 were not traced. Of the three remaining incidents, one came from a domestic or residential source, one from a Crown exempt site, and one from an educational establishment. The largest number of incidents was recorded in South Western Region (32%).

Plates 1 & 2
Rail Tanker at Sandiacre

Plates 3 & 4
Road Tanker at Aust (M4)

Plate 5
Aberystwyth farm incident – vandalised valves

Plate 6
Farm pollution near Penrith

Plate 8
Milk tanker accident in NY Region

Plate 9
Golf course earthworks, Thames Region

6 Analysis of Incidents by Type of Pollutant

6.1 Organic wastes

6.1.1 Total incidents

In 1995 2,699 pollution incidents were attributed to organic wastes, 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 (34%). Other significant types were animal carcasses (12%), cattle manure (6%) and silage effluent (5%). A total of 454 incidents could not be classified (17%). These included incidents related to hay, straw and grain.

6.1.3 Historical trends

Table 11 shows the regional numbers of organic waste incidents in the years 1993 to 1995, and substantiated farm data for 1992. The number of incidents in 1995 decreased significantly when compared to 1994 (a decrease of 15%). The only region where an increase was reported was Severn-Trent (14%). The largest decreases were seen in Northumbria and Yorkshire (37%) and Anglian (35%).

Organic waste was introduced as a new category in 1993 and so direct comparison with earlier years is not possible. Between 1993 and 1995 the number of organic waste incidents fell by 5%, reflecting the reduction in incidents from agricultural premises.

6.1.4 Category 1 incidents

Of the 2,699 organic waste incidents, 28 (1%) were classified as Category 1. This represents 14% of the total number of Category 1 incidents. The types of Category 1 organic waste incidents are shown in Figure 15. The greatest proportion of the incidents involved cattle slurry.

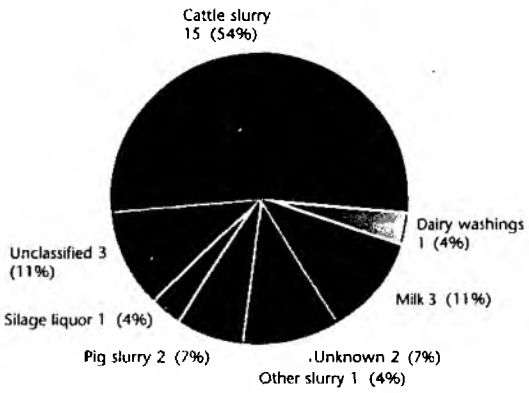


Figure 15 ***Substantiated Category 1 organic waste pollution incidents, 1995***

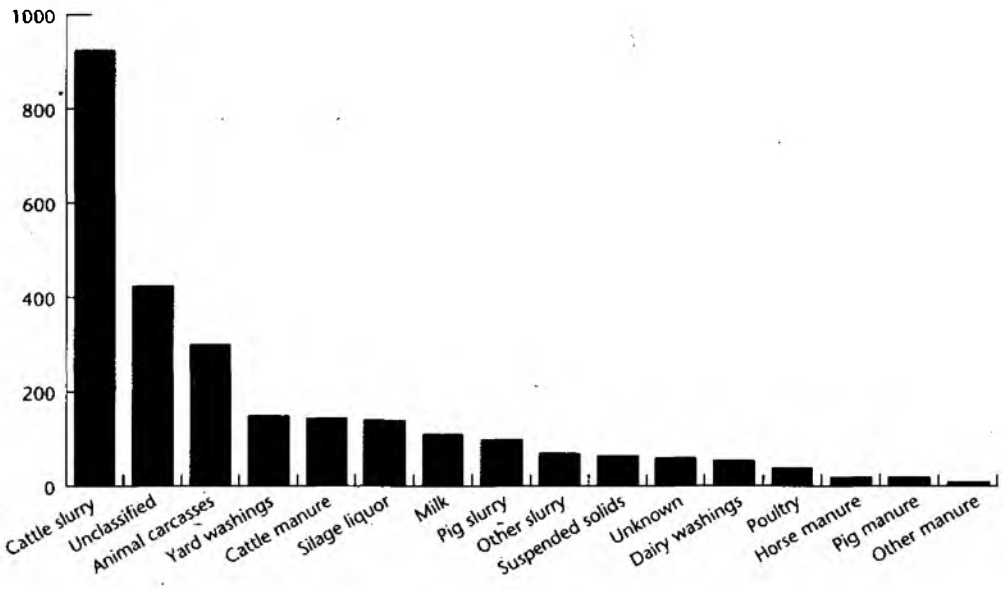


Figure 14 ***Substantiated organic waste pollution incidents, by type, 1995***

Table 11
Total substantiated organic waste pollution incidents by NRA Region 1992-1995

NRA Region	1992*	1993	1994	1995
Anglian	203	329	311	201
Northumbria & Yorkshire	228	320	291	183
North West	406	398	479	408
Severn-Trent	296	381	368	419
Southern	63	101	102	84
South Western	445	848	938	899
Thames	69	102	92	75
Welsh	425	477	584	430
TOTAL	**2,567**	**2,956**	**3,165**	**2,699**

** Substantiated farm incidents by type*

6.2 Fuels and Oils

6.2.1 Total incidents

In 1995 6,025 fuel and oil pollution incidents were substantiated, 26% 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 the most common pollutant type, responsible for 33% of incidents. In 14% of cases the material could not be identified. Waste oil caused 9% of fuel and oil incidents, petrol 7%, gas oil 6%, and kerosene 5%.

6.2.3 Historical trends

Table 12 shows the numbers of fuel and oil pollution incidents between 1988 and 1995. The number of these incidents climbed steadily each year from 1991 to 1994. However, the 1995 figure was the lowest since 1991 with the number of substantiated incidents falling in every region except for South Western (an increase of 5%). The most notable drop was in Anglian Region where the number of incidents reduced by 28% on the 1994 figure.

The number of pollution incidents from fuel and oil increased by 31% between 1991 and 1994. With the fall in such incidents between 1994 and 1995, this increase is now reduced to 14%.

Figure 16
Substantiated fuel and oil pollution incidents by type, 1995

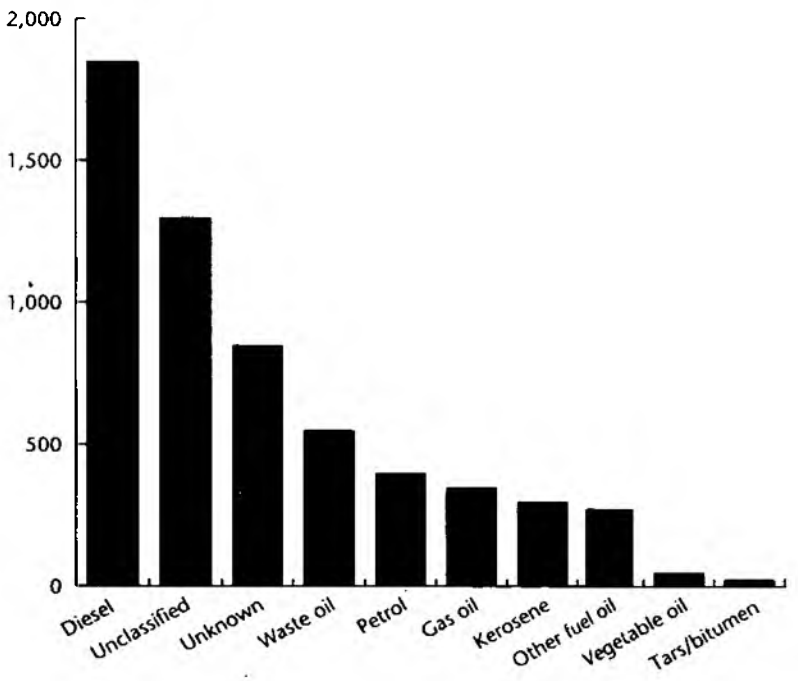


Table 12
Total fuel and oil pollution incidents by NRA Region, 1988- 1995

NRA Region	1988	1990	1991*	1992*	1993*	1994*	1995*
Anglian	478	620	775	873	961	1,023	734
Northumbria & Yorkshire	538	593	524	561	597	705	668
North West	508	593	571	719	806	895	828
Severn-Trent	1,300	1,893	1,194	1,379	1,493	1,519	1,197
Southern	459	492	536	357	469	488	470
South Western	689	383a	734	945	661	865	909
Thames	1,256	1,122	851	876	896	896	780
Welsh	197	250	103	426	490	517	439
TOTAL	5,425	5,946	5,288	6,136	6,373	6,908	6,025

Data up to 1988 from DoE Digest of Environmental Pollution

** Substantiated incidents a Does not include oil from industrial sources*

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 1995. Fuels and oils were responsible for 45 Category 1 incidents, 23% of the total. This percentage is an increase on the figure of 17% for 1994. Northumbria and Yorkshire Region had the most fuel and oil Category 1 incidents (10 or 22%), followed by Severn-Trent Region (8 or 18%). Details of Category 1 incidents are shown in Figure 17.

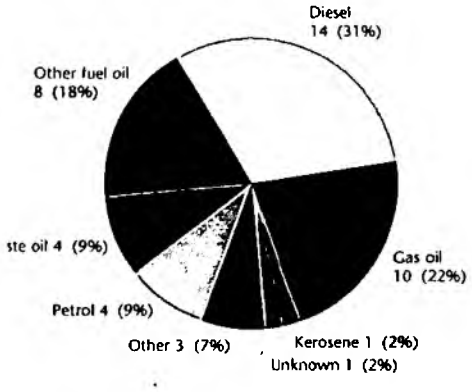


Figure 17
Substantiated Category 1 fuel and oil pollution incidents by type, 1995

6.3 Chemicals

6.3.1 Total incidents

In 1995 there were 1,725 substantiated chemical pollution incidents, representing 8% of all incidents substantiated that year.

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 26% of incidents. Pollution from paints and dyes was the largest identified type (15%), followed by detergents (12%) and other organics (10%). 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 1995. In 1995 the number of pollution incidents fell by 8% compared with 1994. The most notable decrease was in Northumbria and Yorkshire Region where the number of chemical pollution incidents fell by 44%. However, in South Western Region there was a considerable increase (44%) and a minor increase in Severn-Trent Region.

Chemical incidents were not recorded as a separate category until 1992. The number of chemical incidents increased by 31% between 1992 and 1995.

Figure 18
Substantiated chemical pollution incidents by type, 1995

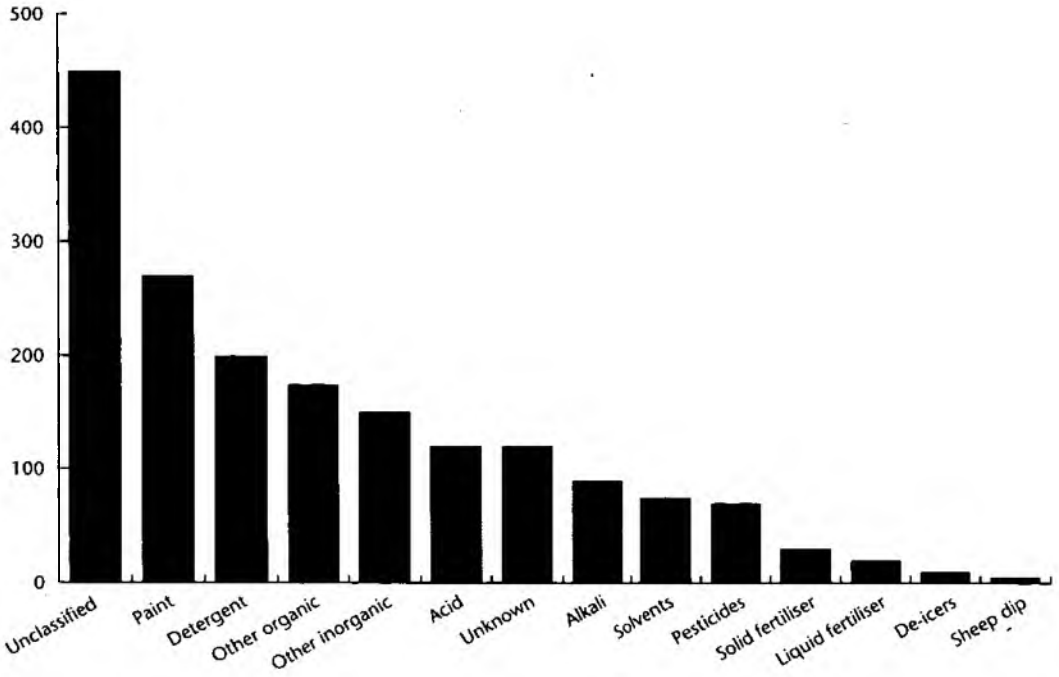
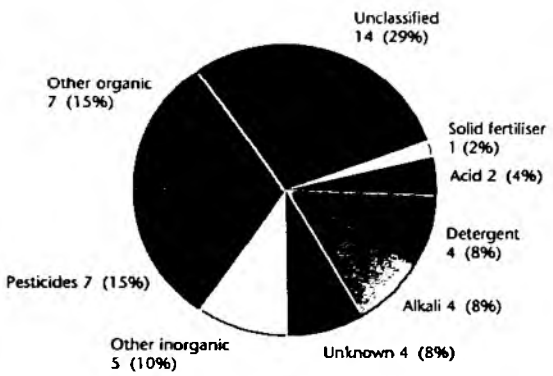


Table 13
Total substantiated chemical pollution incidents by NRA Region, 1992-1995

NRA Region	1992	1993	1994	1995
Anglian	209	198	301	201
Northumbria & Yorkshire	135	410	251	140
North West	236	568	383	359
Severn-Trent	206	281	299	317
Southern	57	100	129	108
South Western	124	145	209	302
Thames	194	172	178	174
Welsh	160	165	134	124
TOTAL	**1,321**	**2,039**	**1,884**	**1,725**

Figure 19
Category 1 chemical pollution incidents by type, 1995



6.3.4 Category 1 incidents

Slightly less than 3% of chemical incidents were classified as Category 1. Details of these are shown in Figure 19. The 48 such chemical incidents represented 24% of the national total of Category 1 incidents, a similar figure to that of 1994. Many of the Category 1 incidents did not fit into the available sub-categories (29%). Of those classified the most common were other organics (15%) and pesticides (15%).

6.4 Sewage

6.4.1 Total incidents

In 1995 there were 6,128 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 1995. By far the largest sewage type was crude sewage, accounting for 46% of incidents. The next most important type was septic tank effluent (11%), followed by treated effluent (10%) and storm sewage (9%). Sewage debris and sewage sludge each caused a small number of incidents, 4% and 2% respectively. The type of sewage could not be classified in 16% of cases and was unknown in only 2% of incidents.

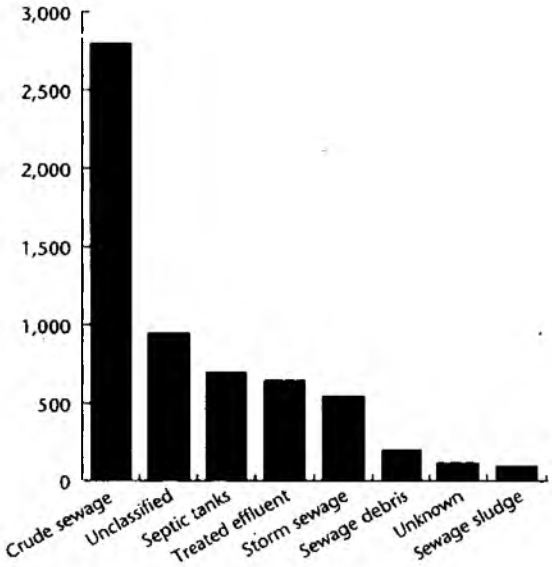


Figure 20
Substantiated sewage pollution incidents by type, 1995

6.4.3 Historical trends

The regional distribution of sewage incidents is shown in Table 14. The incidence of sewage pollution fell by less than 3% between 1994 and 1995, whilst the overall number of incidents declined by nearly 8%. The number of incidents was reduced in Anglian, Northumbria and Yorkshire and Severn-Trent Regions but increased in all other regions. There were large increases in Thames (25%) and North West Regions (23%).

Since the separate recording of pollutant types for the 1992 pollution incident report, the number of sewage pollution incidents increased to a peak in 1993 and has since dropped back to be almost the same in 1995 as in 1992.

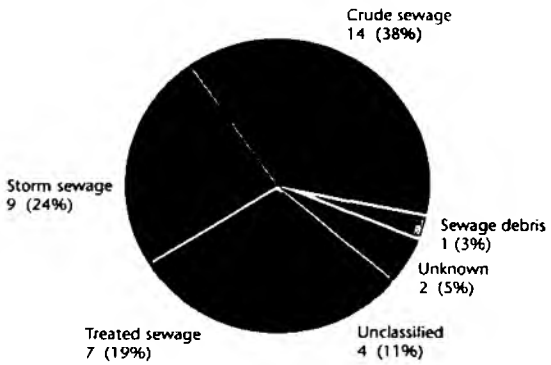
6.4.4 Category 1 incidents

There were 37 Category 1 sewage pollution incidents in 1995, representing 18% of Category 1 incidents. This is a reduction of 29% compared with 1994. The greatest proportion of these incidents were of crude sewage pollution (38%), as is shown in Figure 21. The largest number of Category 1 sewage pollution incidents was recorded in Northumbria and Yorkshire Region (30%).

NRA Region	1992	1993	1994	1995
NRA Region	1992	1993	1994	1995
Anglian	657	586	596	547
Northumbria & Yorkshire	1,032	851	992	825
North West	1,026	1,066	894	1,103
Severn-Trent	961	1,327	1,320	935
Southern	392	215	322	351
South Western	857	1,024	930	988
Thames	423	468	403	507
Welsh	786	836	830	872
TOTAL	**6,134**	**6,373**	**6,287**	**6,128**

Table 14
Total substantiated sewage pollution incidents by NRA Region, 1992-1995

Figure 21
Category 1 sewage pollution incidents by type, 1995



6.5 "Other" types of pollutants

6.5.1 Total incidents

In 1995 there were 6,886 pollution incidents due to "other" pollutant types, representing 29% 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. Figure 22 shows those incidents which could not be classified as another sub-type. Those "other" types which were unclassified or unknown amounted to 34% of the total. Of those which could be identified in detail, the most frequently found were inert suspended solids (20%), natural causes (14%) and rubble and litter (9%).

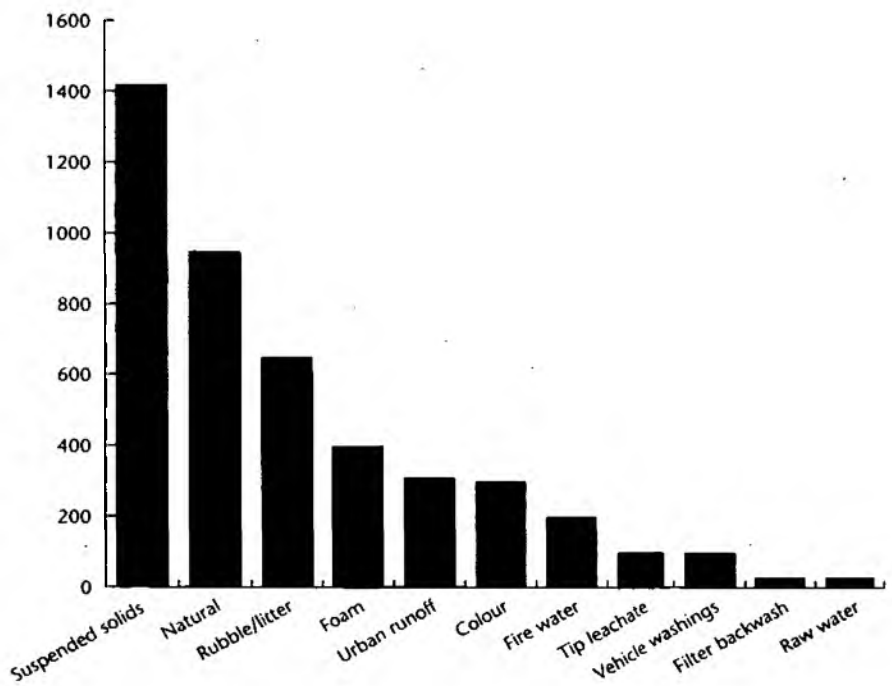
Table 15
Substantiated "other" pollution incidents by NRA Region, 1995

NRA Region	1993	1994	1995
Anglian	551	588	473
Northumbria & Yorkshire	1,464	1,004	760
North West	818	881	1,019
Severn-Trent	1,394	1,389	1,391
Southern	470	275	222
South Western	1,451	1,398	1,460
Thames	433	410	436
Welsh	977	1,199	1,125
TOTAL	**7,558**	**7,171**	**6,886**

6.5.3 Historical trends

The percentage of "other" pollution types in 1995 was 29%, a slight reduction in the percentage recorded for 1994 (34%). The number of incidents classified as "other" rose sharply in North-West Region and fell significantly in Northumbria and Yorkshire Region, compared to 1994.

Figure 22
Substantiated "other" pollution incidents by type, where classified, 1995



In 1990 37% of pollution incidents by type were recorded as "other". However, the earliest direct comparison which can be made is with the 1993 data. Between then and 1995, the number of pollution types listed as "other" declined by 9%.

6.5.4 Category 1 incidents

Of the 36 incidents where type was recorded as "other", 22 were never identified, 12 were due to natural causes and one each to raw water and urban run-off.

7 Limitations of Data

The majority of pollution incident investigations follow a report from a member of the public (although the number of calls from the Fire Services has 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 whom 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 great diversity in polluting materials and the nature of pollution incidents mean that the assessment of 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 NRA staff, may make incident substantiation very difficult or impossible. It is therefore likely that pollution does occur in many of the reported incidents which are not actually confirmed by NRA staff.

In previous years the limitations imposed by the computer systems used in the regions has resulted in many incidents being inadequately categorised by type and source. The figures for this year are much improved and the proportion of incidents categorised as "other" has fallen. However, there is still scope for improvement.

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 where information is available there are often a number of contributing factors. We intend to investigate further the possibility of recording and reporting the causes of pollution.

8 NRA Legal Actions

8.1 Court actions

The regional distribution of prosecutions taken and convictions obtained for pollution offences that occurred in 1995 are shown in Table 16. By the end of December 1995, 151 of these prosecutions had been heard in court and 99% of these resulted in conviction. As at the 1st January 1996, there were 151 cases which still had to come to court. Legal action (prosecution or caution) was taken or expected in 21% of all Category 1 and 2 incidents, compared to 9% in 1994.

In addition to the court action taken against polluters, the NRA could also issue formal cautions. The purpose of these was 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. The regional distribution of cautions issued in 1995 is also given in Table 16. 135 cautions had been issued and 48 were outstanding on the 1st January 1996.

8.2 Prosecution policy

It was the NRA's policy to prosecute Category 1 pollution incidents where there was adequate evidence to support the case. This is not always possible, because the source cannot always be traced, because the incident was the result of the actions of unknown persons, or because Crown exemption applies. The policy for Category 2 incidents was less rigid, and allowed for the use of formal cautions or warning letters where appropriate.

8.3 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.

8.4 Fines

Detailed information on fines for pollution offences is shown in Tables 19, 20 and 21. The largest fine was £17,000. The range of fines was similar to that in 1994. The maximum fine available in the Magistrates Court under Section 85(6) of the Water Resources Act remains £20,000, whilst there is no limit to fines imposed by the Crown Court. In deciding the level of fine the court takes into account both the severity of the offence and the defendant's ability to pay.

8.5 NRA Prosecutions in 1995

8.5.1 Introduction

This section highlights a number of incidents where legal action was taken in 1995. The cases illustrate both the type of incidents that the NRA dealt with and the operation of the legal process.

NRA Region	Number of incidents prosecuted	Number of convictions	Outstanding prosecutions	Number of cautions issues	Number of cautions still to be issued at 31st Dec 95
Anglian	15	15	12	8	7
Northumbria & Yorkshire	14	14	21	19	8
North West	25	24	20	32	6
Severn-Trent	29	28	21	17	5
Southern	8	8	11	3	1
South Western	31	31	31	46	7
Thames	16	16	13	9	0
Welsh	13	13	22	15	14
TOTAL	**151**	**149**	**151**	**149**	**48**

Table 16 ***Regional distribution of prosecutions and convictions for incidents in 1995, by NRA Region***

Table 17
Prosecutions taken and convictions obtained for Category 1 and Category 2 incidents by pollution source, 1995

Pollution source	Category 1			Category 2		
	Incidents	Prosecutions	Convictions	Incidents	Prosecutions	Convictions
Agricultural	32	6	6	372	52	51
Industrial	62	3	3	703	58	57
Sewage and Water Industry	48	3	3	599	5	5
Transport	16	4	4	97	6	6
Other	41	0	0	423	14	14
TOTAL	**199**	**16**	**16**	**2,194**	**135**	**133**

Table 18
Prosecutions taken and convictions obtained for Category 1 and Category 2 incidents by type of pollutant, 1995

Pollution source	Category 1			Category 2		
	Incidents	Prosecutions	Convictions	Incidents	Prosecutions	Convictions
Agricultural	32	6	6	372	52	51
Organic wastes	28	5	5	362	61	60
Fuels & Oils	45	6	6	580	28	28
Sewage	37	2	2	531	13	13
Chemical	48	3	3	239	13	13
Other	41	0	0	482	20	19
TOTAL	**199**	**16**	**16**	**2,194**	**135**	**133**

Table 19
Fines and costs awarded on conviction for pollution incidents occurring in 1995

Pollution source	Range of fines £	Range of costs £
Anglian	250-10,000	200-1,600
Northumbria & Yorkshire	500-10,000	625-3,968
North West	250-10,000	374-1,287
Severn-Trent	300-17,000	300-4,600
Southern	200-5,000	370-830
South Western	150-6,600	75-668
Thames	0-7,500	240-520
Welsh	500-6,000	220-1,852
All regions	**0-17,000**	**75-4,600**

Table 20
Fines and costs awarded on conviction for pollution incidents occurring in 1995, by pollution source

Pollution source	Range of fines £	Range of costs £
Agriculture	250-10,000	75-3,968
Industry	0-6,600	220-4,000
Sewage and Water Industry	1,000-17,000	300-800
Transport	350-15,000	250-1,810
Other	300-10,000	240-1,994

Pollution type	Range of fines £	Range of costs £
Organic waste	250-10,000	75-2,251
Fuels & Oils	0-15,000	240-3,968
Sewage	300-17,000	300-1,994
Chemical	300-10,000	260-4,600
Other	200-10,000	240-1,287

Table 21
Fines and costs awarded on conviction for pollution incidents occurring in 1995, by type of pollutant

8.5.2 Mitigation

NRA v Dalgety Agriculture Limited

A discharge of detergent from a lorry wash at Dalgety's Bury St Edmunds site caused banks of foam 2.5 metres high in the River Lark. The detergent caused the deaths of 6,000 fish. The Magistrates who heard the details were sufficiently concerned about the case to refuse jurisdiction and decide that the matter must be heard before a Judge in the Crown Court.

At the Crown Court hearing on 12th June 1995 Dalgety Agriculture Limited pleaded guilty to an offence of causing poisonous, noxious or polluting matter to enter the River Lark contrary to Section 85(1) Water Resources Act 1991. The Company put forward considerable mitigation showing that the discharge had occurred because two separate contractors had failed to connect the lorry wash pipework as instructed.

Appropriate sentencing can be difficult in cases such as this, where the incident has had a serious impact, but the mitigation put forward was good. The sentencing Judge conditionally discharged the Company for three years and ordered them to pay £6,251.24 costs. Should any offence be committed by the Company within the three year discharge period, then they are liable to be resentenced in relation to this incident.

8.5.3 Discharges to the foul sewer

NRA v Premier Plating Limited

Polluting discharges to the foul sewer can be just as environmentally damaging as those made to surface water drains. A major cyanide pollution of the River Wye at High Wycombe which killed 3,000 fish resulted in the prosecution of a local plating firm. Premier Plating Limited discharged excessive levels of cyanide from their works to the foul sewerage system. The high level of cyanide in the discharge caused a catastrophic failure in the local sewage treatment works and a discharge of toxic pollutant to the river. The River Wye was affected to its confluence with the Thames, a distance of 8 kilometres, and public water supply intakes in the area had to be closed. The Company could not offer an explanation as to how such a high level of cyanide had left their site. They were fined £7,500 with £1,978 costs.

8.5.4 Crown Immunity

NRA v Defence Evaluation & Research Agency

An ammonia release to the Cove Brook near Farnborough, Hampshire which caused a large fish kill was traced to an outfall serving the premises of the Defence Test and Evaluation Organisation, a division of the Defence Evaluation and Research Agency (DERA), which is itself an agency of the Ministry of Defence. The NRA brought proceedings against DERA but before the matter was heard by the court, DERA through the Treasury Solicitor invoked the Defence of Crown Immunity. This is an absolute defence which means that any emanation of the Crown, for example a Government Department, is not bound by the provisions of the Water Resources Act 1991 relating to pollution offences. DERA claimed that they could not waive their immunity and the NRA was forced to withdraw the prosecution. This case highlights the problem of Crown Immunity which affords government departments and related agencies protection against prosecution for pollution offences and allows them to be treated differently to any other individual or company. Crown Immunity means that we cannot prosecute the alleged polluter for incidents which would normally lead to prosecution, like the Cove Brook fish kill. Despite changes to the legislation in the Environment Act 1995, the Crown is still not criminally liable for any contravention of the Water Resources Act, although any contravention by them may be declared unlawful by the High Court.

8.5.5 Testimony of independent witnesses

NRA v Leigh Environmental

On 19th June 1995 Leigh Environmental pleaded not guilty to polluting the Leys Farm Ditch in Oxfordshire. The Company had been contracted to clean out separators at Upper Heyford air base. On the day of the incident witnesses saw oil on the watercourse and heard a pump running at the time Leigh personnel were on site. This was consistent with Leigh staff pumping polluting matter straight into the ditch. Oil and silt were deposited on the

bed and sides of the stream. Leigh denied pumping polluting matter into the ditch. The court found Leigh Environmental guilty and criticised the Company for using "relatively junior" employees and "minimum resources". The Company was fined £10,000 with £2,400 costs.

8.5.6 Role of consultants and supervising engineers in construction projects

Following a complaint of discolouration of the River Lostock near Preston, pollution officers traced the source to a motorway construction site. A water main had been fractured by heavy machinery and a large volume of water had flowed onto part of the site. In order to remove the now silt laden water from the site a pump was installed discharging to a surface water system connecting directly to the river. The contractor was subsequently prosecuted and fined. However, action was also commenced against the Consultant Engineers supervising the project on behalf of the Highways Agency for "knowingly permitting" pollution. Staff from the Consultant Engineers had been aware of the discharge and had observed the silt in the river, but had failed to take action on the site or to notify the NRA. The view was taken by the NRA that the person or company with an overall supervisory role on the site had a duty to act to prevent pollution and failure to do so leaves that person or company open to a charge of "knowingly permitting" pollution. In this particular case the company concerned was eventually offered and accepted a caution for the offence.

8.5.7 Custodial sentence

NRA v Mr M Blake

On the 1st of November 1995 at Colchester Magistrates Court Mr M Blake of Withers Farm, Essex, pleaded guilty to two offences of causing trade or sewage effluent to enter controlled waters contrary to Section 85(3) Water Resources Act 1991. Mr Blake had previously been prosecuted and convicted for similar offences, together with a conviction for breach of the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991. He had refused to pay fines in relation to these previous convictions. The Magistrates indicated that because of his lack of care and refusal to pay earlier fines they were considering sending Mr Blake to prison. The maximum custodial sentence for summary conviction under Section 85 of the Water Resources Act is 3 months imprisonment. Pre sentence reports were ordered and after hearing all the facts, the magistrates finally sentenced Mr Blake to undertake 100 hours community service for each offence (200 hours in total) and to pay costs of £950. This is the closest anyone has come to receiving a custodial sentence for a pollution offence.

8.6 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 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. Investigation and clean-up costs were recovered where the polluter could be identified and more than one hour of authority time was spent on an incident. Table 22 illustrates the costs recovered in 1995. In the future the Environment Agency will continue to strive to recover the costs of pollution from the polluter wherever possible.

Table 22
Costs recovered by each NRA Region in 1995

NRA Region	Number of recoveries	Total of amount billed	Range of costs recovered
Anglian	220	£55,900	£22-£3,683
Northumbria & Yorkshire	587	£147,130	£44-£13,307
North West	51	£26,722	£19-£8,000
Severn-Trent	360	£206,430	£48-£46,792
Southern	198	£74,159	£30-£6,080
South Western*	279	£96,000	£44-£6,707
Thames	186	£79,139	£26-£11,933
Welsh	47	£27,818	£23-£5,600
All regions	1928	£713,298	£19-£46,792

**Data from April to December 1995 only*

9 Conclusions and Recommendations

A number of conclusions and recommendations for future action can be drawn from this report and from the changes which have occurred since the first incident report for 1990.

9.1 The number of reported incidents has again increased slightly in comparison with 1994. Since 1990 the number of reported incidents has increased by over 27%. From its formation in 1989 the NRA endeavoured to increase public awareness of water pollution and its consequences and to make the reporting of pollution incidents easier through the introduction of the Emergency Hotline, a freephone number for use throughout England and Wales. The success of this is reflected in the increased level of reporting. The Environment Agency will continue to use the Emergency Hotline with the same number, 0800 80 70 60.

9.2 Since 1989 the NRA has developed a number of pollution prevention initiatives in an effort to work with farmers, industry and the general public to reduce the number of incidents and their impact. The imposition of a fine of £1,000,000 following an incident on the Mersey in 1989 did much to highlight the risks that pollution posed, not only to the environment but to the reputation and finances of the polluter. Substantiated incidents were not identified separately in the 1990 report but were in 1991. Comparison with 1991 data shows the total number of reported incidents is 22% higher, whilst the number of substantiated incidents is up by only 4%. Category 1 incidents decreased significantly, from 658 in 1990 to 199 in 1995.

9.3 Between 1990 and 1994 the proportion of pollution incidents involving oils and fuels grew from 21% to 27%. The NRA launched a major campaign to reduce the number of such incidents in co-operation with the petroleum industry early in 1995. Although it is too soon to be confident of the impact of this campaign there has been a slight reduction in the percentage and number of incidents involving petroleum products since 1994. However, given that the number of such incidents still exceeds 6,000 per year the campaign will need to be sustained.

9.4 A detailed study of over 220 Category 1 and 2 incidents involving petroleum products was carried out in 1995 to identify factors contributing to the pollution occurring. The role of poor security and vandalism in a significant number of cases was evident. However, up to 60% of these incidents were related in some way to inadequate storage facilities. The most common faults related to the complete lack of a bund wall or damage to the bund rendering it ineffective. The study makes clear that proper bunding of oil and fuel storage tanks is a priority. As a result the NRA and the Institute of Petroleum have again approached the Department of the Environment regarding the introduction of regulations on oil storage similar to those in place for agricultural fuel storage.

9.5 In 1990 farm pollution accounted for 11% (3,147) of all pollution incidents. Regulations were introduced in 1991 to improve the standards of construction of silage, slurry and fuel storage facilities on farms and a number of pollution prevention initiatives were introduced. Although the figure for 1995 shows a similar percentage (12%), the actual number of incidents fell to 2,720. The most notable change, however, is the reduction in the number of Category 1 incidents, from 239 to 32 over the same period. Even when taking into account the overall reduction in Major incidents, the proportion due to agriculture has fallen from 36% to 17%.

This has been achieved by a combination of publicity, pollution prevention, regulations and farm waste grants. It clearly demonstrates that the risk of pollution can be significantly reduced if a sufficiently co-ordinated approach is taken.

9.6 Since 1989 the NRA has made significant improvements in the recording of information on pollution incidents. A uniform categorisation system for the severity of incidents was introduced and used in the 1990 report and a slightly revised system put in place in 1995. Improvements have been made in clearly separating source and type of pollution and in identifying these in more detail. This information is vital for planning pollution prevention activities and identifying the resources required for dealing with pollution incidents. However, due to the lack of a single national database for pollution incidents there are still some difficulties in the recording of incidents, resulting in a lack of detailed information on source and type in some cases.

9.7 Since 1989 the water companies have invested huge sums in sewerage and sewage treatment, making an important contribution to the improvement in water quality which has occurred. However, sewage pollution continues to be a significant problem. The companies are tackling the problems of ageing infrastructure and inadequate capacity highlighted in earlier reports through their agreed programme of investment ("Asset Management Plan 2"). However, although the NRA

has been involved in agreeing priorities for investment, the problems will be with us for many years yet. One consequence of the investment programme has been a decrease in staff numbers and increased reliance on automatic equipment and alarms. Sometimes these fail to operate when needed and in a number of cases this has resulted in major pollution incidents and prosecutions. The NRA has negotiated standard consent conditions relating to telemetry and alarm systems. However, these failures and the consequent damage to the environment are a cause of serious concern and we will continue to work with the companies to tackle this through improved systems which fail safe.

9.8 Data on transport related incidents have been reported separately since 1993. This sector accounts for a significant and growing number of major incidents, a trend which gives cause for concern. Improved liaison with the fire and rescue services has, in some cases, prevented pollution. Changes in vehicle design have been introduced as a result of the lessons learned from some incidents and discussions are under way with representatives of the transport industry to identify changes in operations and vehicle design which could reduce the risk of pollution occurring in the future.

10 References

DEPARTMENT OF THE ENVIRONMENT (1989).
Digest of Environmental Protection and Water Statistics, No 12.
HMSO.

NATIONAL RIVERS AUTHORITY/MINISTRY OF AGRICULTURE, FISHERIES AND FOOD (1990).
Water pollution from farm waste in England and Wales, 1989.
NRA South West Region, Exeter.

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 AUDIT OFFICE (1995).
Report by the Comptroller and Auditor General. National Rivers Authority: River Pollution from Farms in England

MAFF (1991).
Code of Good Agricultural Practice for the Protection of Water

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

APPENDIX A

Definitions

NRA 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.

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, i.e. no evidence can be found of a pollution incident having occurred.

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.

APPENDIX B

Prosecutions relating to pollution which occurred in 1994

Irrespective of the date of hearing.

NRA Region	Prosecutions	Convictions
Anglian	46	45
Northumbria & Yorkshire	30	28
North West	70	67
Severn-Trent	55	54
Southern	17	16
South Western	38	38
Thames	42	41
Welsh	22	21
All Regions	320	310

APPENDIX C

Pollution Prevention Materials available from the Environment Agency

Pollution Prevention Guidelines

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 Mains Drainage is Available
PPG5 - Works in, near or Liable to Affect Watercourses
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 - Guidance note on 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 Ducts and Manholes

In preparation:
Drum storage
Metal Recycling Sites

Leaflets:

River pollution and how to avoid it
Chemical pollution and how to avoid it
Chlorinated solvent pollution and how to avoid it
Pollution from your home and how to avoid it
Is your home killing fish? (advice on wrong connections)
Silt and its effect on the river

Oil Care Campaign:
Follow the Oil Care Code*
Oil Care at Home*
Oil Care at Work*
Oil Care on Your Boat*

Pollution Prevention Pays:
Leaflet*, poster* and video available FREE by phoning 0345 337700

** Also available in Welsh*

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MANAGEMENT AND CONTACTS:

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

ENVIRONMENT AGENCY EMERGENCY HOTLINE
0800 80 70 60

ENVIRONMENT AGENCY

This report details the statistics for pollution incidents notified to and dealt with by the NRA during 1995 and looks back on trends since the formation of the NRA in 1989. It provides an analysis of substantiated pollution incidents by both source and type of pollutant and gives an indication of their environmental impact. The report also gives details of legal action taken in respect of these incidents and a commentary on notable legal cases. In addition the report gives a detailed commentary on how the NRA managed pollution incidents and pollution prevention initiatives, many of which will be continued by the Environment Agency, are described.

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