

WATER POLLUTION INCIDENTS IN ENGLAND AND WALES — 1990



Report of the
National Rivers Authority

January 1992



NRA

National Rivers Authority

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Water Quality Series No. 7
January 1992

ENVIRONMENT AGENCY



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Rivers House, Waterside Drive, Aztec West, Almondsbury, Bristol BS12 4UD*

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ISBN 1 873160 14 3

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Front cover photograph — Supplied by NRA Anglian Region

Typeset, printed and bound by

Stanley L. Hunt (Printers) Ltd, Midland Road, Rushden, Northants

PREFACE

There are many ways in which indicators of water quality, and the many factors which can affect it, can be recorded and analysed: none of these should be used or treated in isolation from the others. Nevertheless, when several of the different aspects are put together they form an overall framework within which future planning and strategy can be formulated.

It had been the practice prior to the NRA's formation for the Department of the Environment to report on the overall occurrence of pollution incidents, and for separate more detailed reports to be written jointly by the Ministry of Agriculture Fisheries and Food, and the Water Authorities Association — and subsequently by the NRA — on farm pollution incidents. This practice is not considered to be equitable, nor a sensible basis upon which to proceed. An attempt has therefore been made to pool such information, in an attempt to improve upon the method of recording and reporting and, more importantly, to target more effectively the resources required to decrease substantially the risk to the water environment which such incidents represent.



Dr R J Pentreath
Chief Scientist

ACKNOWLEDGEMENTS

The data used in this report were collated by E A Palfrey, R Casey and R Wyatt of the Water Research Centre, Medmenham, on an NRA contract.

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SUMMARY

This report is the first comprehensive annual analysis of pollution incident statistics in England and Wales, although basic information has in the past been documented in the DoE publication *Digest of Environmental Protection and Water Statistics*. The report supersedes the previous annual reporting of water pollution from farm wastes alone and adds details of pollution incidents arising from all other sources.

Summary statistics are provided on reported pollution incidents occurring in the calendar year 1990, including details of court actions. The year generally paralleled 1989 in terms of weather, being exceptionally dry and affording conditions of low pollution risk for silage production and run-off related pollution.

A total of 28,143 pollution incidents were reported in 1990, of which about 2.3% were classified as "major" incidents as defined by the NRA incident categorisation system. Oil and sewage pollution incidents were the most commonly reported (21.1% and 20.6% of total reported incidents respectively), with industrial and farm incidents accounting for 10.0% and 11.2% respectively. There appears to be an increasing number of reported oil and sewage related incidents. A total of 272 incidents in 1990 resulted in successful prosecution by the NRA.

It should be stressed that pollution incident statistics are partly based on reports received from the public and therefore do not comprehensively describe the national impact of episodic pollution. There are also difficulties in evaluating the severity of impact and identifying the pollutant source accurately, which reduce the robustness of the data.

1 INTRODUCTION

1.1 BACKGROUND

This report is the first annual analysis of pollution incident statistics issued by the NRA for England and Wales. It supersedes the previous joint annual report of water pollution incidents from farm wastes published by the NRA and MAFF, and adds details of pollution incidents arising from other sources.

1.2 DEFINITIONS

The NRA uses a common incident classification system throughout its ten Regions. This defines three categories of pollution incidents in terms of the severity of their impact: these are categories 1 (major), 2 (significant) and 3 (minor). Appendix A compares the criteria upon which these categories are based with the criteria for the designation of "serious" incidents used in previous annual reports on pollution from farm wastes. (It should be stressed that the new "major" category and the previously used "serious" category are by no means interchangeable, with the former indicating only the most severe incidents.) The "major" incident category is used throughout this report, except that, in order to enable comparisons to be made with previous years, the former "serious" category has been re-introduced in Table 5 in relation to farm related incidents only.

Pollution sources are categorised into five basic types: farm, industrial, oil, sewage, and "other" sources. The "oil" category does not include oils from farm or industrial premises as these are included in the "farm" and "industrial" categories. Farm pollution incidents are further categorised by source according to the definitions used in the earlier annual reports on pollution from farm wastes. The "other" category includes a wide variety of sources including road traffic accidents, domestic spillages, illegal dumping of wastes, leachate problems, etc.

2 ANALYSIS OF INCIDENTS

2.1 ALL INCIDENTS

2.1.1 Regional Distribution

A total of 28,143 pollution incidents were reported to the NRA during 1990. As might be expected, given the wide variation in size and characteristics of the ten Regions, the numbers of incidents varied widely between the Regions from 6,081 in Severn Trent (21.6% of the total) to 1,245 (4.4% of the total) in Northumbria Region (Figure 1).

2.1.2 Historical Trends

Uncertainty in methodology of reporting in previous years precludes an accurate assessment of overall trends, but the total number of pollution incidents reported annually rose steadily between 1981 and 1988 (Figure 2), and reached a high level of over 28,000 in 1990. A decision was taken to exclude detailed discussion in this report of the limited data for 1989 for pollution in categories other than farm pollution. This is because, prior to the NRA's formation in September 1989, numerous different interpretations of incidents and their categorisation were used. However, five of the NRA Regions reported the highest number of incidents in 1990 since 1981, and seven reported an increase from 1988 to 1990 (Table 1), the greatest percentage increase being in the Northumbria Region, which had 57% more incidents in 1990 (1,245) compared with 1988 (795). Much of this increase in reported incidents is believed to be due to a greater public concern and awareness about pollution.

The "total number of reported incidents" is the statistic which has been used to publish pollution incident data in the past. In order therefore to maintain consistency, the data from each Region have been compiled in the same manner as in the past for reporting to MAFF or the DoE. Nevertheless, in compiling data for this report, it has become clear that whilst all of the incidents have been recorded, it has not been possible to substantiate each and every one placed into the third, "minor", category in all ten Regions. It is also the case that, on occasion, the transient nature of some pollution events makes subsequent confirmation virtually impossible. Steps are being taken to provide a more consistent method of reporting in future years.

*Table 1 Total numbers of pollution incidents reported in England and Wales, 1981 to 1990
(Data for 1981 to 1988 from the Department of the Environment, 1989)*

Water Authority Area	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Anglian	1095	1077	1288	1544	1707	1468	1605	1446	1627	1647
Northumbria	509	544	613	654	722	729	671	795	813	1245
North West	1350	1288	1385	2241	2202	2480	2965	3365	3486	4171
Severn Trent	2401	2681	3354	4372	4524	4497	4435	5292	6004	6081
Southern	1300	1327	1400	1547	1668	1725	1795	1742	1634	1789
South West	1143	1227	1639	1685	1796	2220	2251	2760	2709	2958
Thames	1810	2120	2345	2486	2695	2890	2969	3925	3609	3441
Welsh	—	—	—	1418	1681	1619	2489	2707	1463	2746
Wessex	844	790	966	1125	993	1332	1339	1920	1726	1484
Yorkshire	1136	1020	1165	1536	2006	2444	2738	2974	2428	2581
Total	12600*	13100*	15400	18635	19994	21404	23257	26926	25499	28143

* Assumes that the number of incidents in the Welsh Water Authority area in the years 1981-3 accounts for the same percentage of national pollution incidents as in the years 1984-8.

Figure 1 Total Number of Reported Pollution Incidents by NRA Region 1990

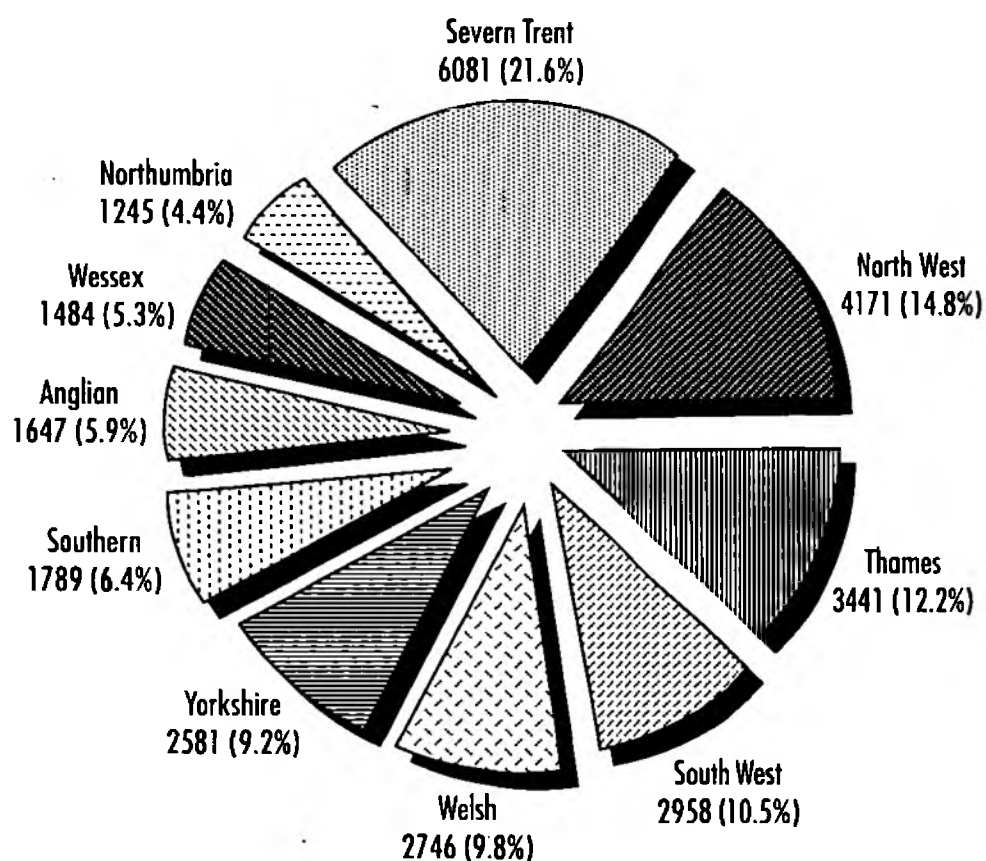
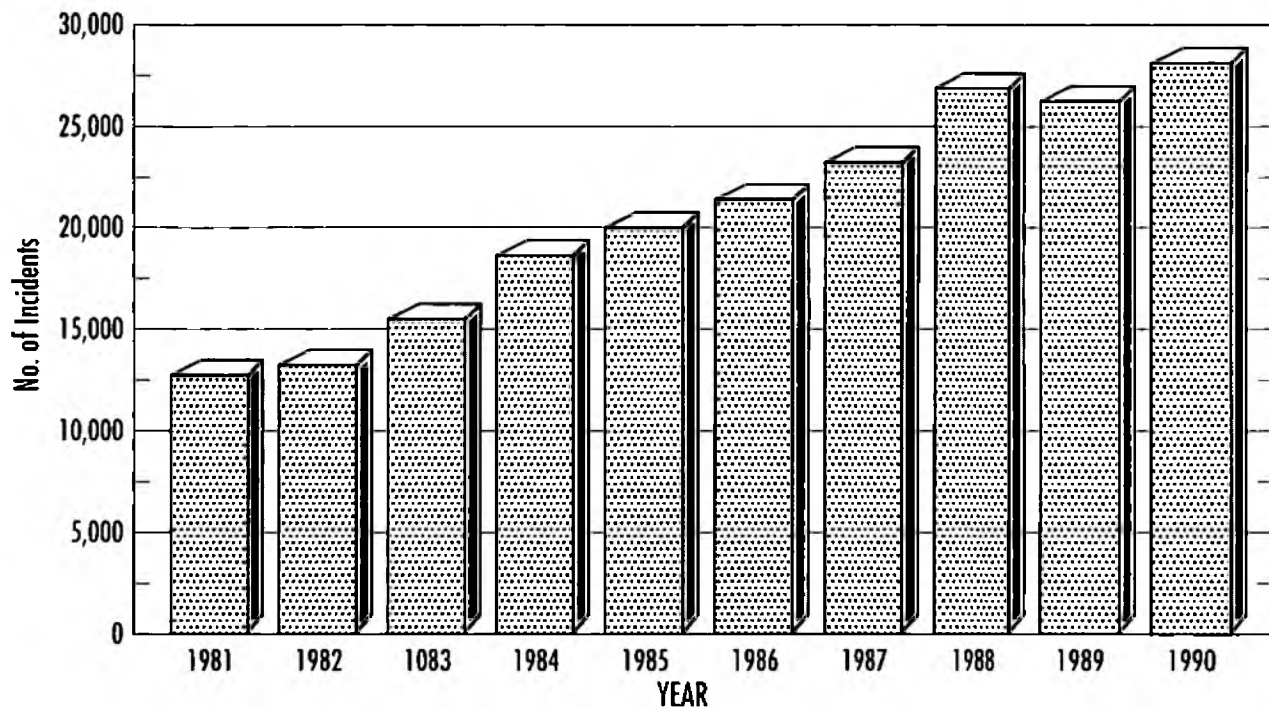


Figure 2 Total Number of Reported Pollution Incidents in England & Wales, 1981-90



2.1.3 Distribution by Category

Table 2 shows the regional distribution of the 28,143 reported incidents by pollution source category. Oil and sewage sources each accounted for around 20% of the total, with farm and industrial incidents each accounting for around 10%. The "other" category accounted for 37.1% of total reported incidents. There are major differences in the relative importance of these categories between the NRA Regions, and these are discussed in detail in Sections 2.2 to 2.6.

Table 2 Total number of reported pollution incidents in 1990 by pollution source category

Region	Farm	Industrial	Oil	Sewage	Other	Total	Percent
Anglian	179	213	620	362	273	1647*	5.9
Northumbria	65	117	248	477	338	1245	4.4
North West	630	267	593	968	1713	4171*	14.8
Severn Trent	271	350	1893	424	3143	6081	21.6
Southern	84	164	492	487	562	1789	6.4
South West	782	339	349	656	832	2958	10.5
Thames	58	385	1122	765	1111	3441	12.2
Welsh	547	138	250	717	1094	2746	9.8
Wessex	226	403	34	218	603	1484*	5.3
Yorkshire	305	426	345	737	768	2581*	9.2
Total	3147	2802	5946	5811	10437	28143	100.1†
Percent	11.2	10.0	21.1	20.6	37.1	100.0	

* Substantiated incidents

† Rounding error

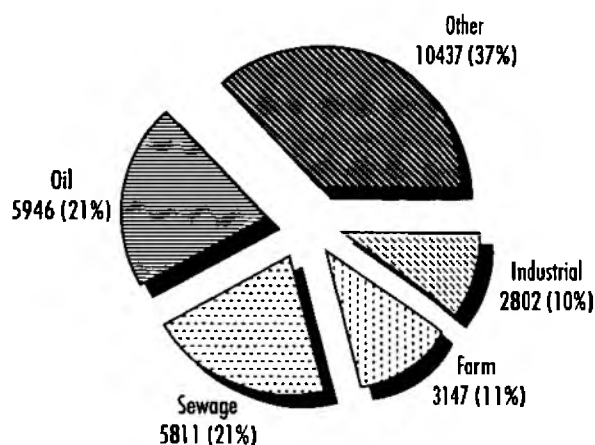
2.1.4 Major Incidents

Of the 28,143 incidents reported, 658 (2.3%) were "major", and of these the largest fraction (36%) originated from farms; some 20% originated from sewage; 17% from industrial sites, whilst the remainder were due to oil and other sources (Figure 3). The regional distribution of major incidents for each category in 1990 is shown in Table 3.

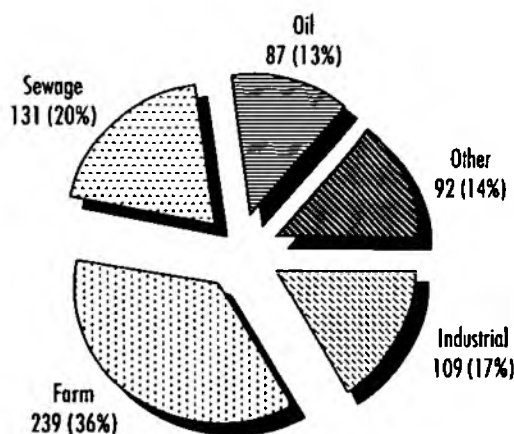
Over 70% of all reported major incidents occurred in only three regions (North West, Severn Trent and South West). The other seven regions each contributed between 2.1% and 7.6% of the total. The proportion of major incidents thus also varies regionally, with North West and South West recording over 4.6%, and Welsh and Wessex less than 1% of their respective totals.

A national summary of total incidents and major incidents is shown in Figure 3.

Figure 3 Total Number of Pollution Incidents by Category 1990



a) Total number of Incidents



b) Major Incidents only

Table 3 Total number of major pollution incidents by pollution source category, 1990

Region	Farm	Industrial	Oil	Sewage	Other	Total	Percent
Anglian	36	1	0	0	2	39	5.9
Northumbria	5	7	5	4	7	28	4.3
North West	55	41	14	34	36	180	27.4
Severn Trent	46	20	46	32	4	148	22.5
Southern	2	5	5	4	1	17	2.6
South West	71	13	3	33	15	135	20.5
Thames	0	7	4	4	7	22	3.3
Welsh	3	4	4	4	10	25	3.8
Wessex	4	1	0	3	6	14	2.1
Yorkshire	17	10	6	13	4	50	7.6
Total	239	109	87	131	92	658	100.0
Percent	36.3	16.6	13.2	19.9	14.0	100.0	

2.2 FARM POLLUTION INCIDENTS

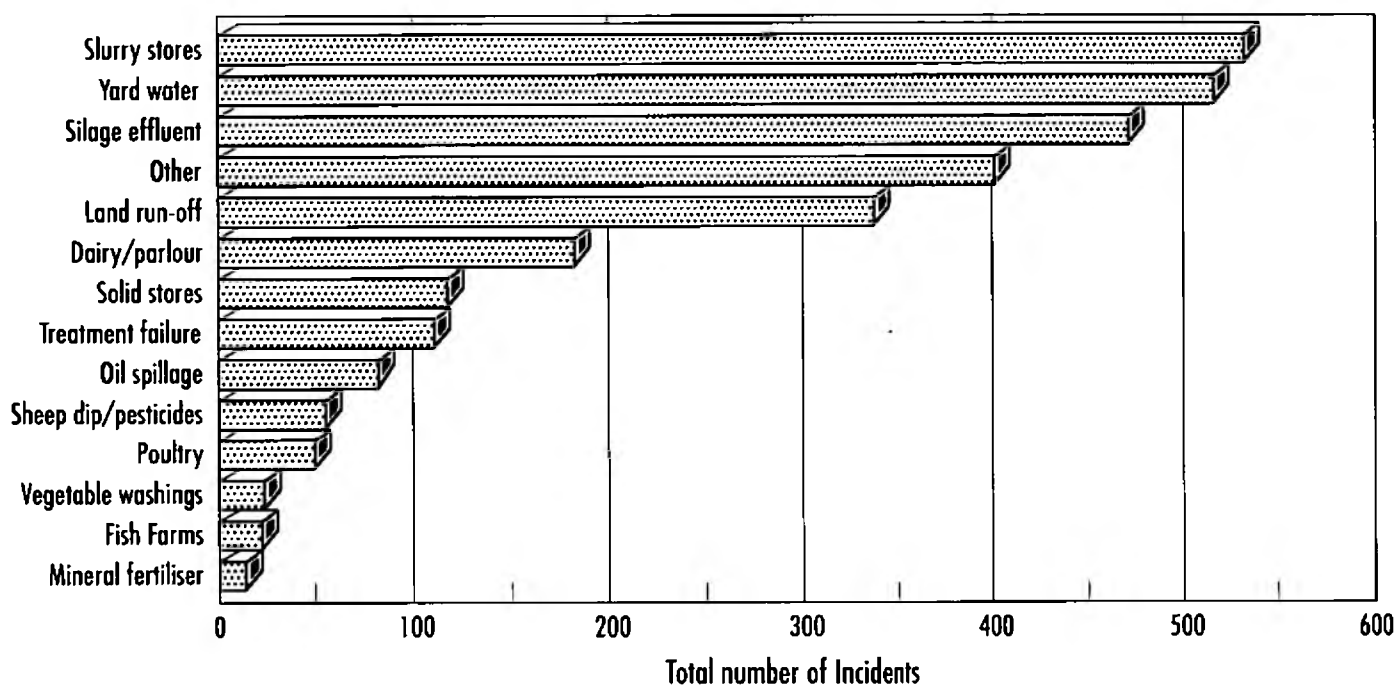
2.2.1 Total Incidents

Altogether 3,147 farm pollution incidents (11.2% of the total) were reported during 1990. The detailed breakdown of farm pollution statistics for each NRA Region is given in Appendix B.

2.2.2 Sources of Farm Pollution

The national distribution of incidents by source for the years 1985 to 1990 is shown in Table 4 and, for 1990 only, in Figure 4. Of the total number of farm pollution incidents in 1990, 72% were related to cattle farming (both dairy and beef); incidents caused by slurry store leaks, yard washings, and silage were the most frequently reported.

Figure 4 Farm Pollution Incidents by source 1990



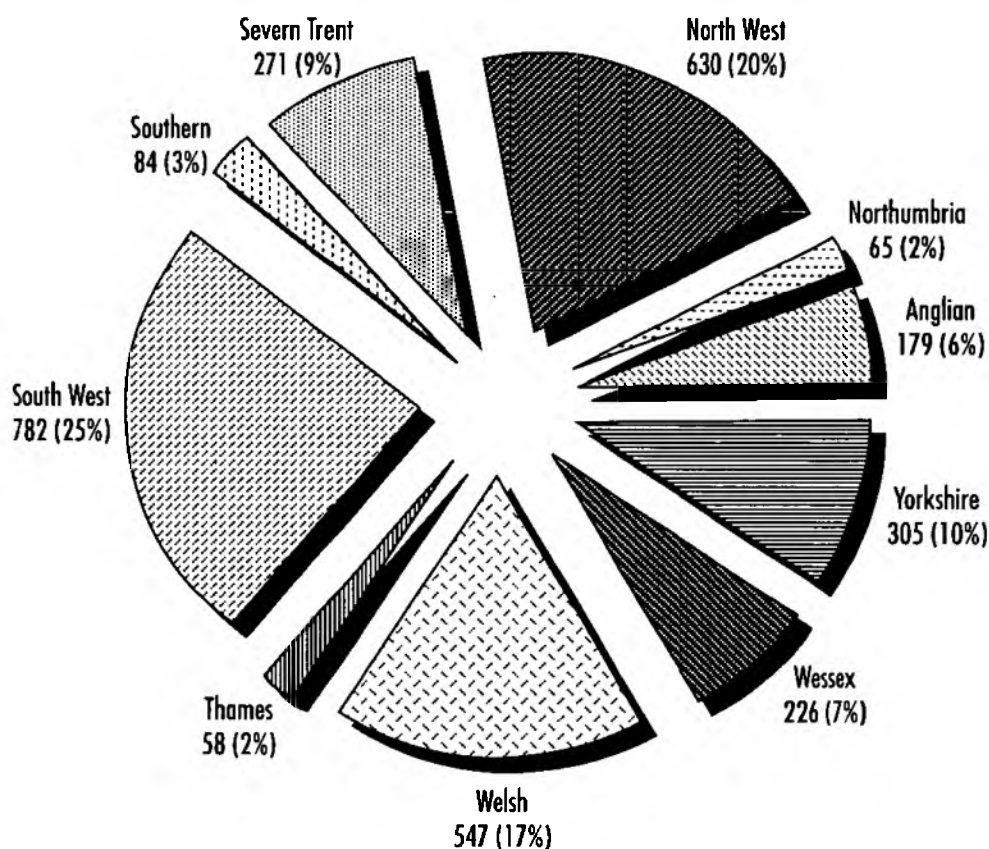
2.2.3 Regional Distribution

Figure 5 shows the distribution of farm pollution incidents occurring in 1990 by NRA Region. The proportion varied considerably from Region to Region. The lowest, some 5% or less, were reported in the Northumbria, Severn Trent, Southern and Thames Regions. Elsewhere, however, farms were a frequent pollution source; it was the most commonly reported type of incident in the South West Region (26%), and was an important source of pollution in North West, Welsh and Wessex Regions. The high number of silage-related incidents in the North West Region (Appendix B) was probably due to high rainfall around the silage-making period.

Table 4 Farm pollution incidents by source, 1985-1990
(Data prior to 1990 from NRA/MAFF (1989) and Water Authority/MAFF annual farm waste reports)

Source of Pollution	1985	1986	1987	1988	1989	1990
COWS						
Slurry Stores	717	695	705	801	589	531
Solids Stores	185	143	148	194	121	118
Yard/Parlour Washing	610	816	821	836	578	697
Land Run-off	180	244	212	345	380	335
Treatment System Failure	116	177	84	96	65	110
Silage Liquor	1006	592	1003	815	245	470
Total	2814	2667	2973	3087	1978	2261
PIGS						
Slurry Stores	164	169	217	231	169	101
Yard Washing	85	89	54	59	64	66
Land Run-off	57	69	74	89	92	60
Treatment System Failure	7	21	21	20	19	20
Total	313	348	366	399	344	247
Others	383	412	551	655	567	639
Total	3510	3427	3890	4141	2889	3147

Figure 5 Total Farm Pollution Incidents by NRA Region, 1990



2.2.4 Historical Trends

The numbers of farm pollution incidents, by pollution source, for the years 1985 to 1990 are shown in Table 4, and by NRA Region over the same period in Table 5. Figure 6 shows the total number of farm pollution incidents reported annually between 1981 and 1990. Overall, the total number of incidents reported in 1990 (3,147) was higher than reported in the 1989 Farm Pollution Report drawn up jointly by NRA and MAFF in 1989 (2,889), but still reflected an improvement on the period 1985 to 1988. Severn Trent, Southern and Thames Regions have shown a continuing decline in farm related incidents since 1987, and in Northumbria and Southern Regions such incidents now comprise less than 5% of the total numbers of pollution incidents. Only in North West and South West Regions were significant increases recorded, the latter due largely to yard washing and failures in treatment systems, although a continuing farm waste campaign resulted in considerable improvements in those limited areas which had been targeted.

The dry summers of 1989 and 1990 were probably factors in ensuring relatively small numbers of farm incidents in some areas. This is particularly noticeable in the low numbers of silage liquor incidents, reflecting dry conditions prior to "wilting", although the conversion to "baled silage" storage in recent years is also likely to have assisted in this trend.

2.2.5 Major/Serious Incidents

Farm pollution incidents in 1990 accounted for a higher proportion of major incidents than in each of the other four categorised types of incident (Table 3). Slurry stores and silage liquor incidents were a particularly important component (Table 6). More than half of the incidents classified as major in the Anglian and South West Regions were due to farms, and approximately a third in North West, Severn Trent, Yorkshire and Wessex Regions (Table 3). For comparison, the numbers of serious farm pollution incidents, using the MAFF/NRA definition, which occurred in each NRA Region between 1985 and 1990 are shown in Table 5.

New Regulations under the Water Act 1989 have been brought into force during 1991 to control the storage of silage, slurry and agricultural fuel oil, and this should result in a marked decline in pollution incidents of this nature in future years.

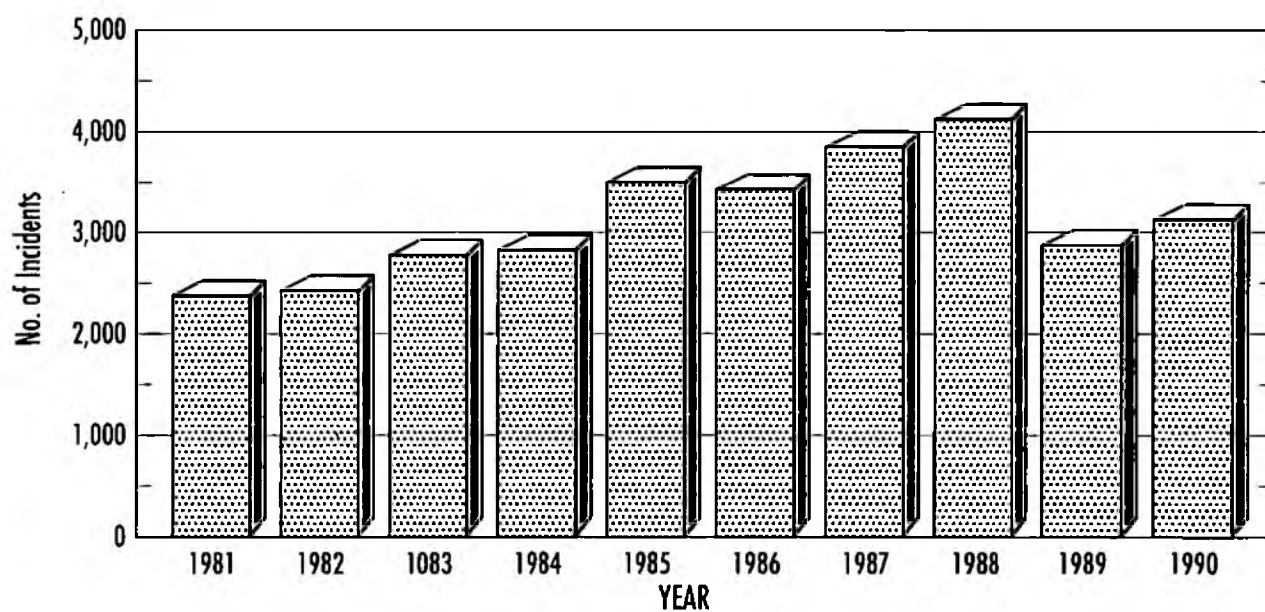
*Table 5 Total farm pollution incidents by NRA region, 1985-1990
(Data for 1989 from NRA/MAFF annual farm waste reports; prior to 1989 from WAA/MAFF reports). (R=reported; S=serious)*

NRA Region	1985		1986		1987		1988		1989		1990	
	R	S	R	S	R	S	R	S	R	S	R	S
Anglian	304	30	275	41	223	42	205	31	204	23	179	—
Northumbria	70	6	59	6	94	6	80	15	63	6	65	6
North West	630	33	491	162	539	97	841	125	468	89	630	140
Severn Trent	594	103	521	92	654	130	625	77	431	44	271	46
Southern	188	58	156	52	189	46	95	17	80	13	84	12
South West	622	76	830	74	666	422	836	420	589	160	782	173
Thames	131	12	111	17	182	58	160	36	125	7	58	9
Welsh	462	95	404	56	716	123	567	112	354	67	547	134
Wessex	224	46	328	57	271	46	401	70	306	90	226	49
Yorkshire	285	113	252	65	336	20	331	37	269	23	305	39
Total	3510	572	3427	622	3870	990	4141	940	2889	522	3147	—

Table 6 Major farm pollution incidents by source, 1990

Source of Pollution	Incidents	Major	% Major
COWS			
Slurry Stores	531	69	13.0
Solid Stores	118	5	4.2
Yard/Parlour Washings	697	30	4.3
Land Run-off	335	12	3.6
Treatment System Failure	110	9	8.2
Silage Liquor	470	62	13.2
PIGS			
Slurry Stores	101	6	5.9
Yard Washing	66	3	4.5
Land Run-off	60	5	8.3
Treatment System Failure	20	5	25.0
Others	639	33	5.2
Total	3147	239	7.6

Figure 6 Total Number of Reported Farm Pollution Incidents in England & Wales, 1981-90



2.3 INDUSTRIAL POLLUTION INCIDENTS

2.3.1 Total Incidents

A total of 2,802, 10.0% of all pollution incidents reported during 1990, were due to industrial sources.

2.3.2 Regional Distribution

The regional distribution of industrial incidents is presented in Figure 7, which shows that the largest percentage (15.2%) in this category occurred in the Yorkshire Region whereas only 4% occurred in the Northumbria Region.

Industrial sources were not, generally, a large component of the total number of incidents reported.

2.3.3 Historical Trends

The total numbers of reported industrial incidents in 1987, 1988 and 1990 are shown for each region in Table 7. There is no clear national trend. At a regional level, however, both Northumbria and Wessex Regions, which in 1987 reported relatively low numbers of incidents (42 and 52 respectively) reported steep rises in 1990 to 117 and 403 respectively, the latter mainly due to the reporting of minor incidents.

In general, the main industrial Regions reported a greater number and proportion of pollutions arising from industrial sources, although Wessex and South West regions, both considered to be rural areas, reported significant numbers of minor incidents which were of an industrial nature.

A welcome trend towards the reporting of incidents occurring on industrial sites has been noted, but several Regions indicated that complex surface water drainage systems, and wrong connections of foul sewage and industrial waste outlets into the surface water drainage system, have made the investigation of incidents on industrial estates very difficult. This applies in some cases to so-called "dry" industries which produce little or no trade effluent.

2.3.4 Major Incidents

Only 4% of the total reported industrial incidents were classified as major in 1990. There was however, considerable regional variation in the proportion of industrial incidents which were classified as major, the highest proportion occurring in the North West Region where, of the 267 industrial incidents, 41 (15.4%) were major. Overall, 16.6% of the total number of major incidents were from industrial sources (Figure 3).

Figure 7 Total Reported Industrial Pollution Incidents by NRA Region, 1990

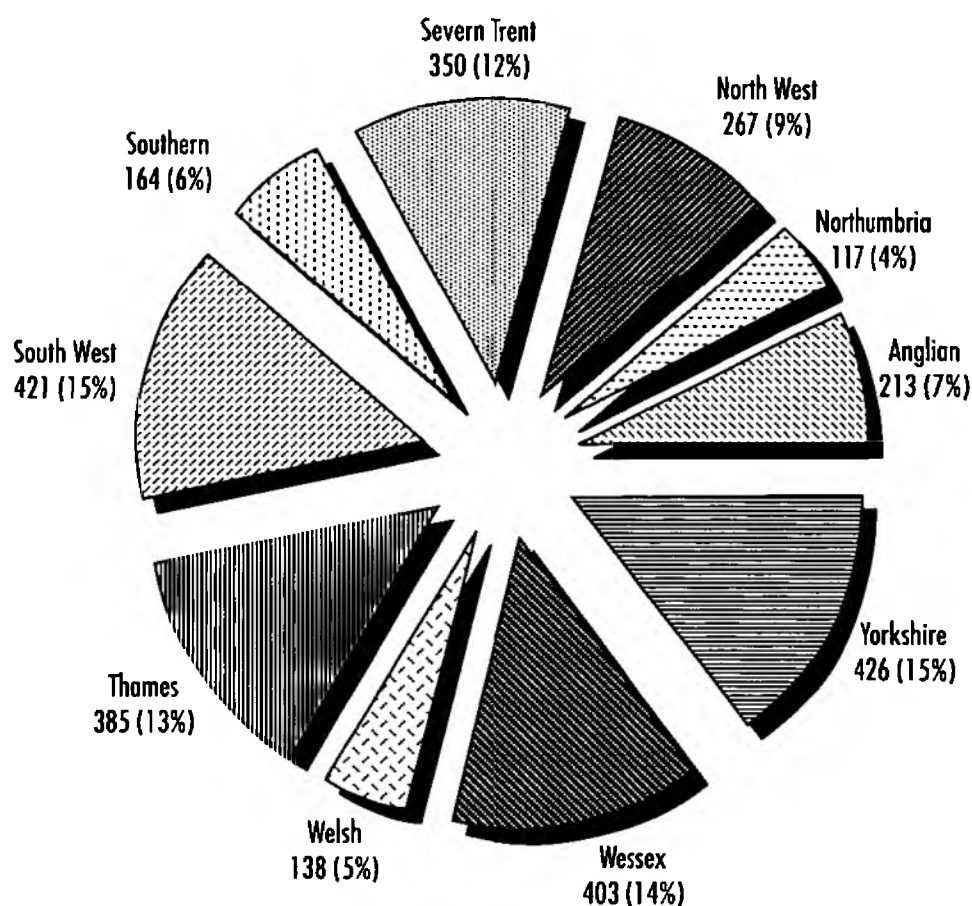


Table 7 Total industrial pollution incidents by NRA region, 1987-1990. (Data up to 1988 from DoE Digest of Environmental Pollution and Water Statistics 1988 and 1989 and provided by previous Water Authorities)

NRA Region	1987	1988	1990
Anglian	180	169	213
Northumbria	42	66	117
North West	336	338	267
Severn Trent	785	1108	350
Southern	181	182	164
South West	252	341	339
Thames	190	323	385
Welsh	237	353	138
Wessex	52	160	403
Yorkshire	537	620	426
Total	2792	3660	2802

2.4 . OILS AND RELATED PRODUCTS

2.4.1 Total Incidents

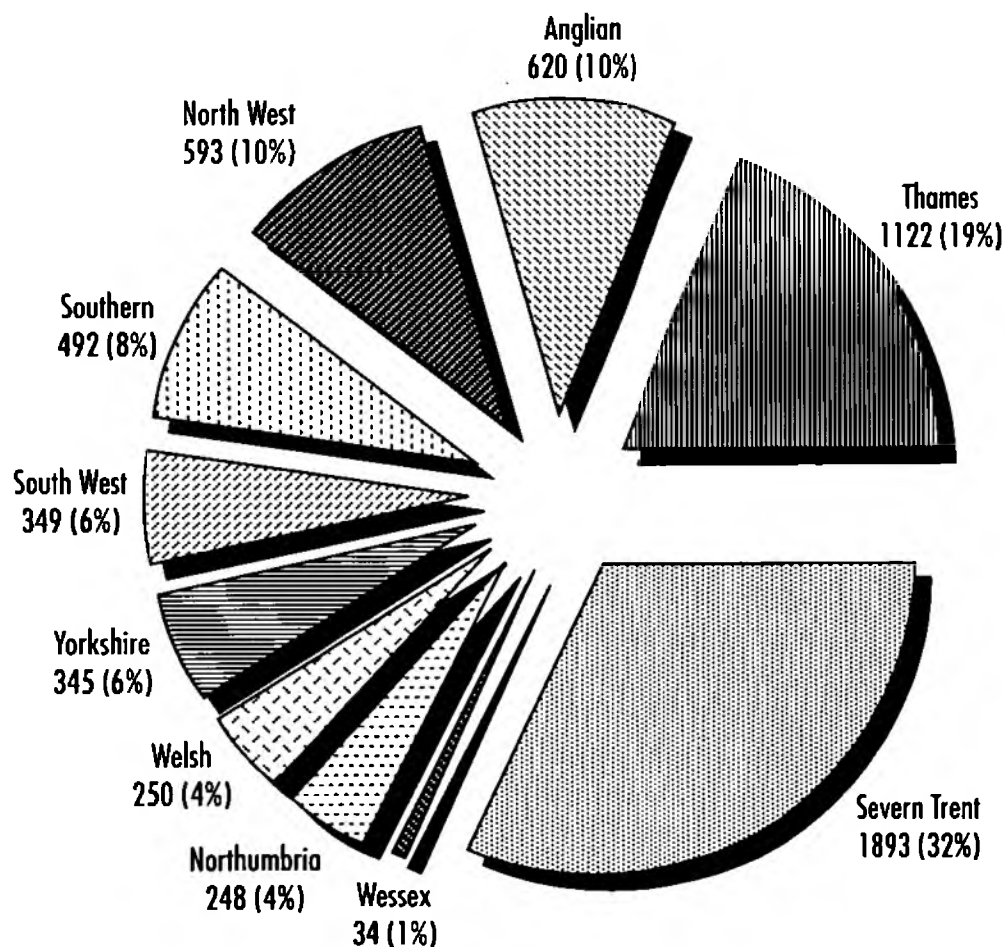
There were 5,946 oil pollution incidents reported during 1990, accounting for 21.1% of the total of reported incidents.

2.4.2 Regional Distribution

The regional distribution of oil pollution incidents is illustrated in Figure 8, which shows a very wide variation: thus 36% occurred in the Severn Trent Region whereas less than 1% occurred in the Wessex Region.

Oil pollution incidents were a large component of the total number of reported incidents in some Regions, accounting for 38% of total reported incidents in the Anglian Region, and around 30% in the Severn Trent, Southern and Thames Regions. Only 34 oil-related incidents were identified in Wessex region, accounting for 2% of incidents.

Figure 8 Total Reported Oil Pollution Incidents by NRA Region, 1990



2.4.3 Historical Trends

The total numbers of reported oil pollution incidents in 1987, 1988 and 1990 are shown for each region in Table 8. Many regions showed a disturbing increase in the number of oil pollution incidents: in Northumbria, Severn Trent and Welsh Regions, the number of oil pollution incidents in 1990 was close to double the figure reported in 1987. The high number of oil pollution incidents in the industrialised areas of the North West Region in 1990 were attributed to the low summer flows and greater visibility of oil films. Many incidents in the Northumbria Region were due to inadequate storage of fuel products in unbunded tanks adjacent to drains. In Wessex, the number of oil incidents reported in 1990 was dramatically lower than in previous years, and the low proportion of oil pollution incidents in this region (2%) in 1990 was therefore considered atypical.

*Table 8 Total oil pollution incidents by NRA region, 1987-1990
(Data up to 1988 from DoE "Digest of Environmental Pollution
and Water Statistics 1988 and 1989")*

NRA Region	1987	1988	1990
NRA Region	1987	1988	1990
Anglian	603	478	620
Northumbria	128	135	248
North West	494	508	593
Severn Trent	1078	1300	1893
Southern	483	459	492
South West	208	254	349
Thames	861	1256	1122
Welsh	133	197	250
Wessex	393	435	34
Yorkshire	402	403	345
Total	4783	5425	5946

2.4.4 Major Incidents

A very small proportion (1.6%) of the total reported oil pollution incidents were classified as "major" and as a consequence 13.2% of all major incidents were from this source. One of the features of oil pollution is the visible effects of small quantities of oil, which leads to a high level of public reaction. The high proportion of the total reported incidents which fall into the "oil" category (20.4%) is nevertheless a matter of concern, because the amount of effort expended in dealing with such incidents, and the difficulty of tracing and taking action against those responsible, is very high relative to the polluting effect of many such incidents.

2.5 SEWAGE POLLUTION INCIDENTS

2.5.1 Total Incidents

There were 5,811 sewage pollution incidents reported during 1990, accounting for 20.6% of the total; some 2,803 were caused by discharges from sewerage systems and 1,126 were from sewage treatment works. It was not possible to determine precisely the origin of 1,882 incidents which may have arisen from works, storm overflows, blockages or other sources.

2.5.2 Regional Distribution

The regional distribution of total reported sewage pollution incidents is shown in Figure 9, which indicates a range from 17% of incidents in the North West Region, to 4% in the Wessex Region.

Sewage pollution incidents were a large component of the total reported incidents in most regions, accounting for between 15% and 38%, except in the Severn Trent Region where only 7% were related to this source.

2.5.3 Historical Trends

The total numbers of sewage pollution incidents in 1987, 1988 and 1990 are shown for each region in Table 9. There has been an increase in total numbers, from 4,177 incidents in 1987 to 5,811 in 1990. The long dry spells in 1990, interspersed with brief periods of rainfall, resulted in some urban rivers being affected by storm discharges from combined sewer overflows. One notable exception to this trend was the Severn Trent Region, in which the number of reported incidents declined from 880 in 1987 to 424 in 1990; the low proportion of reported sewage pollution incidents in this region (7%) in 1990 was thus not typical of previous years.

2.5.4 Major Incidents

Of the 5,811 sewage pollution incidents occurring nationally in 1990, 2.3% were classified as major. The regional percentages varied between 0% (Anglian Region) and 7.5% (Severn Trent Region).

Figure 9 Total Reported Sewage Pollution Incidents by NRA Region, 1990

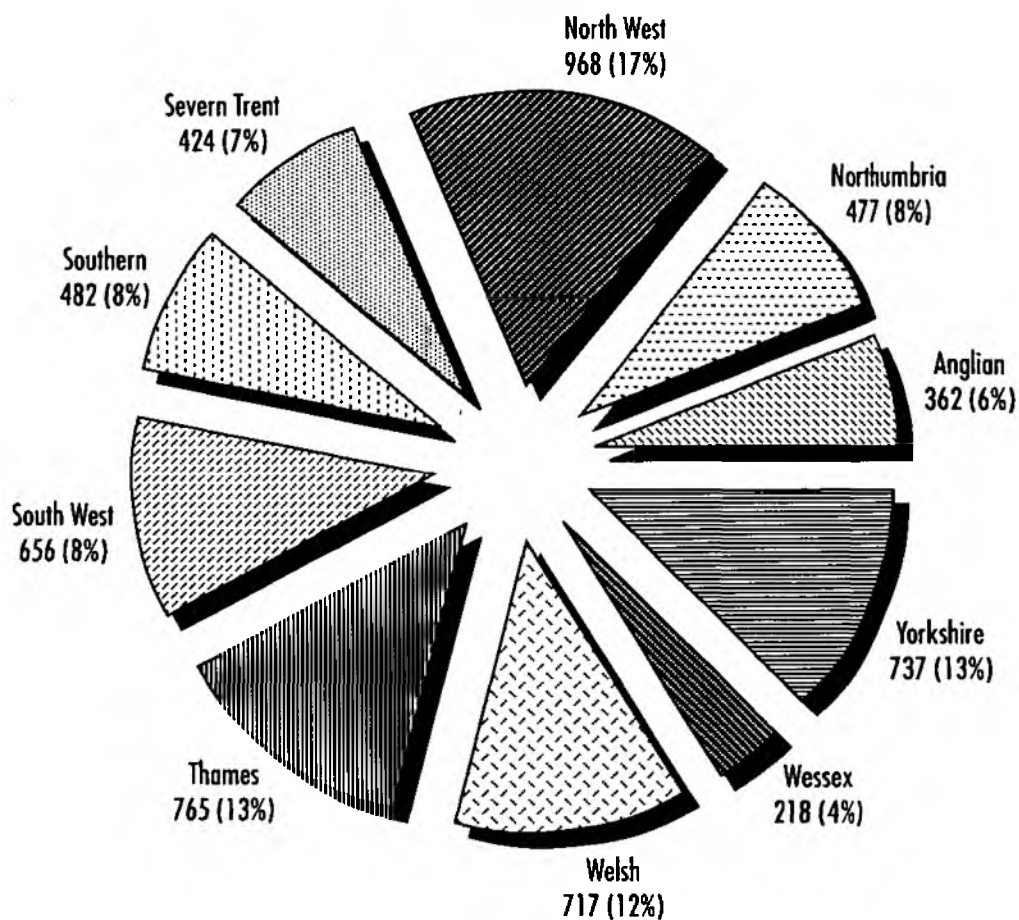


Table 9 Total sewage-related incidents by NRA region, 1987-1990
(Data up to 1988 from DoE Digest of Environmental Pollution and Water Statistics 1988 and 1989)

NRA Region	1987	1988	1990
Anglian	381	373	362
Northumbria	232	273	477
North West	460	614	968
Severn Trent	880	772	424
Southern	320	345	487
South West	427	488	656
Thames	423	610	765
Welsh	402	476	717
Wessex	129	168	218
Yorkshire	524	459	737
Total	4177	4578	5811

3 NRA COURT ACTIONS

Table 10 shows the number of cases taken to court within each region in 1990, and the number of successful prosecutions. These figures relate only to offences which occurred and for which prosecution took place during 1990. It does not include records of caution or warnings which were issued. Further action may have taken place in 1991 for offences which occurred in 1990. A total of 282 incidents occurred in 1990 for which legal proceedings were taken, and of these, 272 resulted in convictions.

3.1 Regional Distribution

The regional variation in the number of incidents for which court action was undertaken is given in Table 10.

*Table 10 Regional distribution of court actions/prosecutions in 1990 against incidents occurring in 1990**

NRA Region	Number of Incidents Taken to Court	Convictions
Anglian	18	18
Northumbria	12	12
North West	65	61
Severn Trent	41	39
Southern	6	6
South West	55	52
Thames	13	12
Welsh	21	21
Wessex	19	19
Yorkshire	32	32
Total	282	272

* A considerable number of cases were outstanding at 1 January 1991 and are not included in this table.

3.2 Distribution by Category

Table 11 and Figure 10 show the variation in the number of prosecutions relative to the number of major incidents for each incident category.

Table 11 Prosecutions in 1990 by pollution source category

Category	Number Prosecuted	Prosecuted/Major %
Farm	123	51
Industrial	76	70
Oil	21	24
Sewage	27	21
Other	35	38
Total	282	43

3.3 Historical Trends

Table 12 shows the historical trend in prosecutions by category between 1987 and 1990, with farm-related cases broken down into the formerly used MAFF/NRA pollution categories. A continued reduction in the number of prosecutions for silage-related incidents is evident, from 96 cases in 1987 down to 13 in 1990; this corresponds with a reduction in the number of silage-related incidents over the same period, from 1,003 to 470. The number of prosecutions for sewage-related incidents has increased, from 12 in both 1987 and 1988 to 27 in 1990.

Figure 10 Prosecutions by Incident Category, 1990

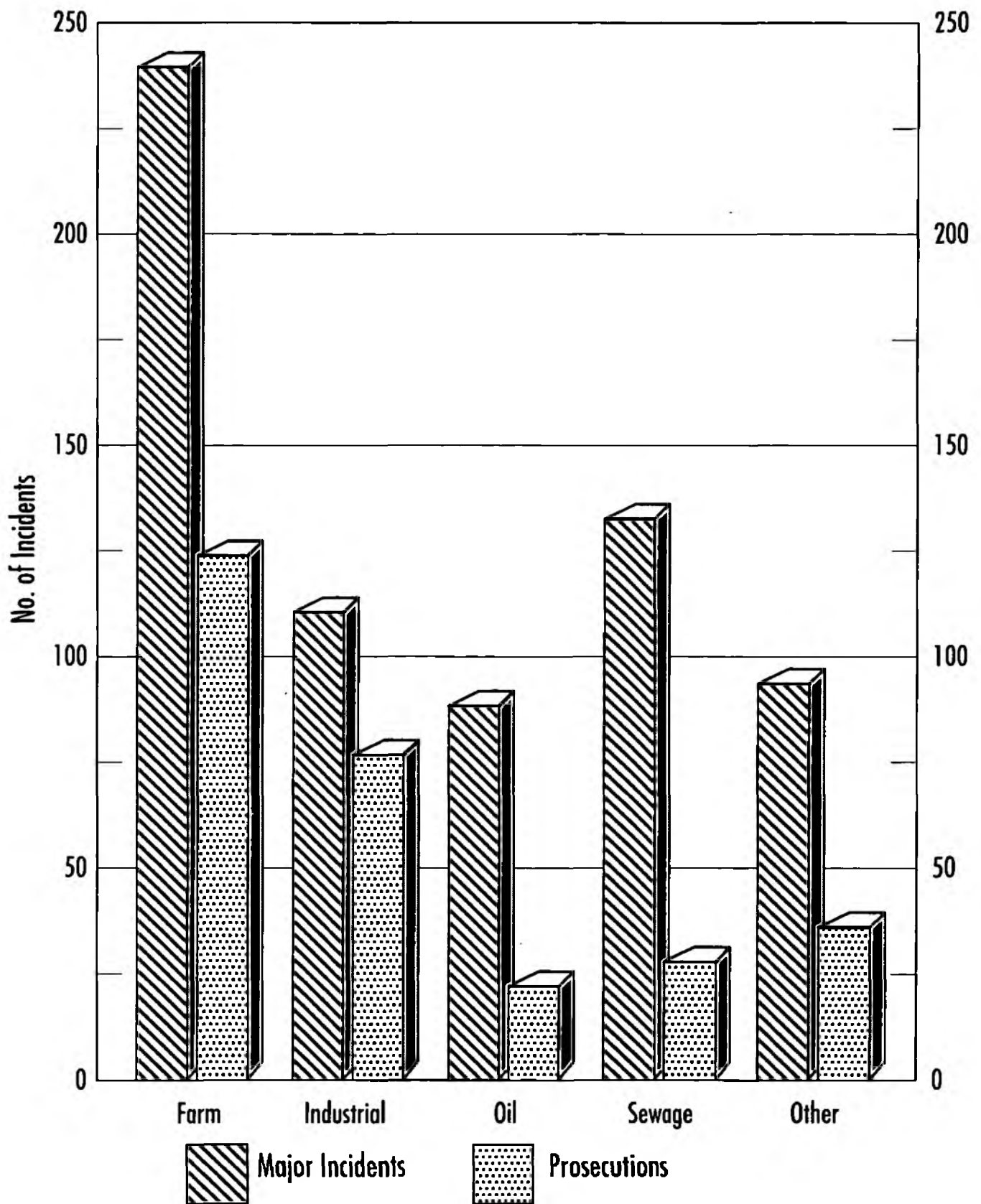


Table 12 Prosecutions by pollution source category, 1987-90
(Data up to 1989 from NRA/MAFF, 1990) (I=Incidents, P=Prosecutions)

Source of Pollution	1987		1988		1989		1990	
	I	P	I	P	I	P	I	P
FARM — Cows								
Slurry stores	705	56	801	41	589	64	531	40
Solid stores	148	5	194	1	121	2	118	1
Yard/Parlour washings	821	7	836	11	578	14	697	27
Lead run-off	212	4	345	8	380	20	335	15
Treatment system failure	84	6	96	1	65	3	110	10
Silage liquor	1003	96	815	55	245	28	470	13
FARM — Pigs								
Slurry stores	217	15	231	16	169	16	101	11
Yard washings	54	2	59	0	64	0	66	0
Land run-off	74	11	89	5	92	2	60	1
Treatment system failure	21	5	20	0	19	3	20	1
FARM Other	551	18	655	10	567	9	639	4
FARM Total	3890	225	4141	148	2889	161	3147	123
Industrial	2792	102	3660	103	2770	27	2802	76
Oil	4783	20	5425	29	5510	16	5946	21
Sewage	4177	12	4578	12	4350	61	5811	27
Other	5017	16	6039	0	8671	60	10437	35
Total	20659	375	23843	292	24190	164	28143	282
% Total Prosecuted	—	1.8	—	1.2	—	0.7	—	1.0

3.4 Fines

Table 13 shows the Regional incidence in fines imposed for water pollution incidents.

Table 13 Fines for Pollution incidents that occurred and which resulted in convictions in 1990

NRA Region	Average Agricultural Incident Fine £	Range of Agricultural Fines £	Average Other Incident Fine £	Range of Other Fines £
Anglia	438	200-1,000	810	200-1,500
Northumbria	1,250	500-2,000	756	0*-1,600
North West	400	200-1,250	949	250-2,000
Severn Trent	381	0*-1,000	759	100-15,000
Southern	600	400-800	950	300-1,000
South West	428	100-1,500	553	200-1,250
Thames	275	250-300	930	500-1,500
Welsh	545	100-1,600	1294	50-2,000
Wessex	592	300-2,000	867	500-1,250
Yorkshire	350	125-500	726	0*-1,800
Nationally	431	50-2,000	747	0-15,000

* Conditional Discharge

4 LIMITATIONS OF DATA

Incident statistics are dependent upon public observation and for this reason their quality will be influenced by factors such as population density, public awareness, and the visibility of the pollution. Incident information is therefore likely to underestimate the true extent of episodic problems to a degree which varies across England and Wales.

For a number of reasons, difficulties arise in the assessment of impact severity associated with an incident. The entry of polluting material may cease prior to the arrival of NRA staff, or the public may not report the incident until after it has occurred, making substantiation of the incident impossible. There is also an inevitable amount of subjectivity remaining in the assessment of severity, and this leads to regional differences in the interpretation of the new national categorisation system, particularly in the designation of incidents into categories 2 (Significant) and 3 (Minor).

The problems associated with positively identifying the pollutant source when investigating an incident have led to a large number being categorised as "other" incidents, rather than being assigned to specific pollutant sources. In 1990, 10,437 incidents were classified as "other", representing the largest category (37.1%) of reported incidents. However, only a small proportion of incidents in the "Other" category (1.3%) were classified as major, and consequently only 14% of major incidents in 1990 were classified as "other". Improvements in computerisation of data now in place will enable this problem to be largely resolved in future years.

Lastly, even when the pollutant source has been identified there may be regional (or even personal) differences in the interpretation of pollutant source categories (ie oil, industrial, sewage, farm and indeed for the type of farm incident where this is separately categorised). Within the farm category it is often difficult to assign an incident to a source category due to the involvement of more than one pollutant material (eg slurry and silage liquor).

5 CONCLUSIONS

A total of 28,143 pollution incidents were reported in England and Wales in 1990, and around 2.3% of these were classified as "major" incidents as defined by the new NRA incident categorisation system.

Farm pollution accounted for 11.2% of the total, and 36% of the major incidents. It was a very important source of incidents in the South West, North West, Welsh and Wessex Regions. Nevertheless, a lower number of farm incidents was reported in 1989 and 1990 than in previous years. This may be due to the dry summers, giving low risk conditions for silage making and the disposal of animal waste, but the NRA and its predecessor Water Authorities have undertaken farm pollution awareness campaigns for a number of years and these together with a greater appreciation of pollution problems by the farming community, will also have had an impact. A relatively high proportion (7.6%) of farm pollution incidents were classified as "major".

Industrial pollution accounted for 10.0% of total reported incidents in 1990. There was no clear historical trend in the number of industrial incidents; only 4% of industrial incidents were classified as "major".

Oil pollution accounted for 21.1% of total reported incidents in 1990, and the number of oil-related incidents appears to be increasing. Oil was a very important source of incidents in the Anglian, Severn Trent, Southern and Thames regions. A relatively low proportion (1.6%) of the total reported oil-related incidents were classified as "major".

Sewage pollution accounted for 20.6% of the total reported incidents in 1990. In many regions the number of reported sewage-related incidents appears to be increasing.

REFERENCES

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

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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) extensive remedial measures necessary;
- f) major effect on amenity value.

Category 2

A significant pollution which involves one or more of the following:

- a) notification to abstracters necessary;
- b) significant fish kill;
- c) measurable effect on invertebrate life;
- d) water unfit for stock;
- e) bed of watercourse contaminated;
- f) amenity value to the public, owners or users reduced by odour or appearance.

Category 3

Minor suspected or probable pollution which, on investigation, proves unlikely to be capable of substantiation or to have no notable effect.

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 kms;
- b) interferes with water abstraction through quantity and quality;
- c) results in fish mortality;
- d) causes significant interference with legitimate use of water, including stock watering;
- e) adversely affects any SSSI, nature reserve or area of high conservation interest.

APPENDIX B

Reported Farm Pollution Incidents in 1990

Incidents 1990	A	N	NW	ST	S	SW	T	W	WX	Y	TOT
Cows											
Slurry Stores/Waste Collection Tanks	15	13	110	53	21	79	7	160	52	21	531
Solid Stores	11	3	26	20	4	16	5	14	8	11	118
Yard Washing	12	7	78	28	8	168	5	100	38	71	515
Dairy/Parlour Washing	2	4	43	21	7	11	1	67	11	15	182
Land Run-off Treatment System	5	5	24	13	16	176	2	50	35	8	335
Failure	3	5	2	9	0	61	6	5	15	4	110
Silage	2	16	247	43	3	32	3	57	10	57	470
Pigs											
Slurry Stores	31	2	15	18	11	2	1	7	5	9	101
Yard Washing	20	3	9	2	0	0	2	4	1	25	66
Land Run-off	13	1	6	10	3	2	1	11	6	7	60
Treatment System Failure	12	0	1	2	0	0	0	0	2	3	20
Others											
Poultry	6	0	16	9	—	4	0	4	3	7	49
Sheep Dips	0	1	3	0	1	2	0	6	1	1	15
Pesticides	15	1	1	4	4	5	1	0	0	8	39
Mineral Fertiliser	7	0	0	0	1	1	0	1	2	1	13
Vegetable Washing	13	0	2	2	0	0	2	0	3	0	22
Oil Spillages	12	1	0	24	0	16	9	10	7	0	79
Fish Farms	0	0	0	01	1	5	1	4	8	1	21
Other	0	3	46	12	4	202	12	47	19	56	401



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