

Environment & Heritage Service

# Regulation of Water Service Discharges Report 2004

A Report by the Water Management Unit



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Printed and published by Environment & Heritage Service,

Publishing Unit, Commonwealth House, 35 Castle St, Belfast, BT1 1GH

ISBN - 1-905127-40-5

June 2006



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## Executive Summary

*Environment and Heritage Service (EHS) has previously published two reports detailing the compliance of Water Service discharges from 2001 to 2003. This report presents changes and trends in compliance with discharge standards up to the end of 2004. Information on progress with capital works schemes, as of December 2005, is also included.*

*Compliance with EHS standards for discharges from 275 Waste Water Treatment Works (WWTW) serving a population equivalent (pe) greater than 250 and the effluents from 30 Water Treatment Works (WTW) is presented. The results of compliance against the requirements of the Urban Waste Water Treatment (UWWT) Regulations (Northern Ireland) 1995 are also included for 35 WWTWs that qualified under the Regulations during 2004. For details of the regulatory system that is employed, readers may wish to refer to the 2001 Report available at [www.ehsni.gov.uk/pubs/publications/Reg\\_WSD.pdf](http://www.ehsni.gov.uk/pubs/publications/Reg_WSD.pdf).*

### Compliance of WWTWs with EHS Standards

The results of compliance against the Registered Standards set by EHS, on the public register for the period 1997 to 2004, are set out in **Table 1**.

**Table 1: Summary of Compliance with WWTW Registered Discharge Standards**

	1997	1998	1999	2000	2001	2002	2003	2004
Number of WWTWs on the Public Register	133	134	159	160	268	270	274	275
Percentage of discharges complying with numeric standards	68%	80%	85%	77%	54%	66%	67%	77%
Percentage of discharges complying with descriptive standards	100%	95%	97%	100%	100%	100%	100%	100%
Overall Compliance with discharge standards	<b>73%</b>	<b>83%</b>	<b>87%</b>	<b>81%</b>	<b>58%</b>	<b>69%</b>	<b>70%</b>	<b>80%</b>

The sustained improvement in compliance with EHS standards since 2001 can be attributed to a number of new WWTWs being commissioned and to continuing improvement schemes carried out by Water Service.

**Figure 1: Filter beds at Markethill WWTW**



### Compliance with UWWT Regulations

The compliance of WWTW effluent discharges with the UWWT Regulations is shown in Table 2.

In 2004, 35 discharges qualified under the Regulations. As can be seen in **Table 2**, compliance has decreased following a sustained improvement in 2002 and 2003. This decline can be attributed, at least in part, to problems with Water Service sampling and analysis systems during its reorganisation in 2004. All WWTWs that were non-compliant in 2004 because of sampling difficulties had met the required effluent quality standard. The works affected are identified in **Section 2 Table 11**.

**Table 2: Summary of Compliance for all UWWT Regulation WWTWs**

Percentage Compliance					
1999	2000	2001	2002	2003	2004
53%	53%	35%	46%	60%	43%

In **Table 3** compliance for the 14 WWTWs, serving a pe greater than 10,000, discharging to Sensitive Areas (Eutrophic) and requiring nutrient reduction, demonstrates a significant reduction in compliance. This reduction was not due to a deterioration in effluent quality but resulted from failure to comply with the sampling requirements of the Regulations during the Water Service re-organisation.

**Table 3: Summary of Compliance for WWTWs Discharging to Sensitive Areas**

Percentage Compliance					
1999	2000	2001	2002	2003	2004
53%	53%	60%	60%	79%	29%

### Future WWTW Compliance

The UWWT Regulations require all WWTWs in Northern Ireland to provide levels of treatment that will adequately protect the waterway to which they discharge (referred to as “appropriate treatment”) by the end of 2005. To meet this requirement, EHS is working to determine environmental needs standards for all WWTWs by the end of 2005 and to place these standards on the public register. It is estimated that there are over 800 WWTWs with pe less than 250 in Northern Ireland that require such standards to be determined and placed on the Public Register.

### Sewerage Systems

Information on improvements to the sewerage systems (termed “collection systems” in the Regulations) serving the major towns in Northern Ireland is presented in **Section 3**.

EHS and Water Service are currently working together in a number of project groups to identify and rectify unsatisfactory Combined Sewer Overflows (CSOs), and to both rationalise sewer systems and limit the pollution of receiving waters due to storm water overflows. The upgrading of sewerage systems serving 15 WWTWs has now been completed, or is under construction, and upgrading proposals for another 56 systems are subject to a process of agreement. Negotiations on the upgrading proposals for sewerage systems serving another 34 WWTWs will be addressed in 2006.

## Compliance of WTWs with EHS Standards

The compliance of WTW effluents with their EHS Registered Standards is presented for the years 1998 to 2004 in **Table 4**. Compliance increased from 18% in 1998 to 50% in 2002 but has decreased to 40% in 2004 primarily due to failures to meet EHS sampling requirements as a result of the Water Service reorganisation.

**Table 4: Summary of WTWs Compliance 1998-2004**

	1998	1999	2000	2001	2002	2003	2004
Number of WTW discharges monitored	22	26	24	27	26	27	30
Percentage of WTW discharges complying	18%	31%	46%	48%	50%	44%	40%



## Section 1 **Waste Water Treatment Works**

## Compliance 2004

Although Water Service discharges are not subject to control under the Water Order (Northern Ireland) 1999, they are, by administrative agreement, regulated by conditions similar to those that would apply under that legislation. The standards and conditions for each discharge are set out in Registered Standard documents. Details of compliance with the standards is available on the Public Register, which holds that information on all WWTWs with population equivalents (pe) greater than 250.

This Section summarises 2004 compliance, and identifies trends in compliance since 1997, for those WWTWs on the Public Register. Compliance for the period 1997 to 2004 is summarised in **Table 5** and presented in **Figure 2**.

The results show an improvement in compliance from 73% in 1997 to 87% in 1999. This was followed by a slight drop to 81% in 2000 and then a sharp decline in 2001 to 58%. The percentage compliance figures in 2001 were affected by the introduction of tighter standards for coastal discharges and some inland works to meet the requirements of the UWWT Directive and the addition to the Register of a further 107 works with pe greater than 250.

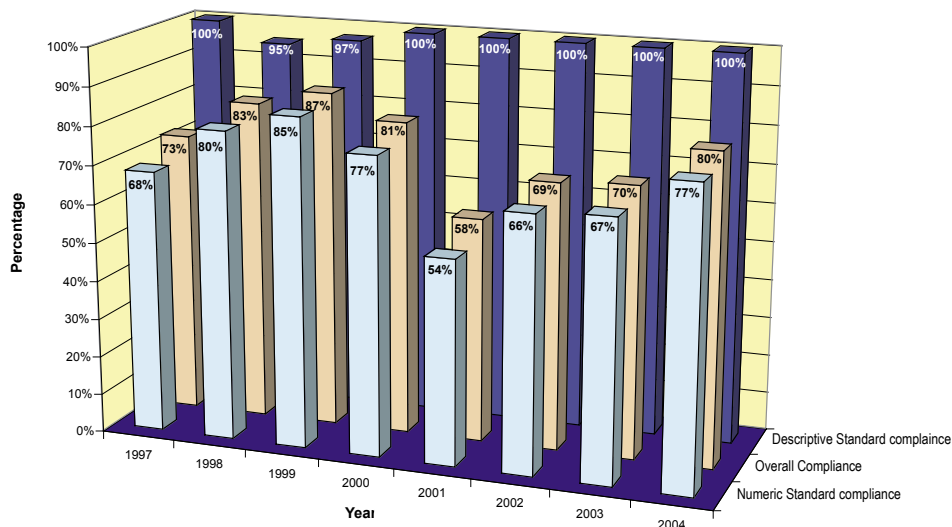
Compliance has improved since 2002 and in 2004 was 80%. This improvement was influenced by the completion of new works and upgrades under the Water Service Capital Works Programme.

Details of compliance with the UWWT Regulations can be found in **Section 2**.

**Table 5: WWTWs Registered Discharge Standard Compliance**

	1997	1998	1999	2000	2001	2002	2003	2004
Number of WWTW discharges on the Public Register	133	134	159	160	268	270	274	275
Number of discharges with numeric standards	111	112	130	133	247	249	254	255
Number of discharges complying with numeric standards	75	90	110	102	134	165	171	196
Percentage of discharges complying with numeric discharge standards	68%	80%	85%	77%	54%	66%	67%	77%
Number of discharges with descriptive standards	22	22	29	27	21	21	21	20
Number of discharges complying with descriptive standards	22	21	28	27	21	21	21	20
Total number of compliant WWTWs	97	111	138	129	155	186	192	217
Percentage of discharges complying with descriptive standards	100%	95%	97%	100%	100%	100%	100%	100%
<b>Overall Compliance with discharge standards</b>	<b>73%</b>	<b>83%</b>	<b>87%</b>	<b>81%</b>	<b>58%</b>	<b>69%</b>	<b>70%</b>	<b>80%</b>

**Figure 2: Summary of WWTW compliance 1997-2004**



Information on the WWTWs that were non-compliant with their numeric discharge standards in 2004 is tabulated for individual works in **Appendix A**. The 2001 Report provided specific details on the status of non-compliant works and further information, updated to the end of 2005, can be found in **Appendix B**. Where no reference is made to a particular WWTW the comments in the 2001 Report are still relevant.

**Figure 3: Rotating Biological Contactor (RBC) at Killeen**



## Priority Pollutants (Dangerous Substances) and other Standards

Aghanloo 2 is currently the only WWTW that must comply with effluent quality standards set for what are now known as "priority pollutant" parameters. **Table 6** summarises compliance with these standards in 2004.

**Table 6: Priority Pollutant Compliance in 2004**

Name of WWTW	Standard Compliance*				
	Soluble Chromium mg/l	Soluble Copper mg/l	Soluble Lead mg/l	Soluble Nickel mg/l	Soluble Zinc mg/l
<b>Aghanloo 2</b>		X		X	

\* Standards compliance is absolute i.e. must be met for all samples. (X - Non-compliant parameter)

## Flow data

In 2004 Water Service measured and provided a record of the flow received at 36 major/new WWTWs where flow measurement facilities are in place. This measurement was of inlet flow and/or flow to full treatment.

Water Service has scheduled a programme of improvements in flow measurement facilities at the works listed in **Appendix C**. These improvements were planned for completion by the end of 2004. Also, as new or upgraded WWTWs become operational, Water Service is ensuring that flow measurement facilities are installed and that the flow information is forwarded to EHS for assessment.

EHS considers the provision of flow monitoring to be a vital part of the regulation process and Water Service is making considerable investment in providing adequate flow measurement facilities to ensure compliance with future regulatory requirements.

## Figure 4: New Membrane Bioreactor (MBR) at Ballynadolly WWTW



## New Registered Standards placed on the Public Register

Victoria Bridge WWTW was placed on the Public Register in 2004 and the WWTWs listed in Table 8 were placed on the register from the beginning of 2005.

**Table 7: WWTW Placed on the Public Register from 1 June 2004**

Name of WWTW	Biochemical Oxygen Demand (BOD) mg/l	Suspended Solids (SS) mg/l	Ammonia (NH <sub>4</sub> ) mg/l	Receiving Water
Victoria Bridge	40	60		Mourne River

**Table 8: WWTWs Placed on the Public Register from 1 January 2005**

Name of WWTW	Biochemical Oxygen Demand (BOD) mg/l	Suspended Solids (SS) mg/l	Ammonia (NH <sub>4</sub> ) mg/l	Receiving Water
Ballybogey	20	30	5	Burngushet
Ballymacvea	60	60		Kells Water
Bonnanaboigh	40	60	10	Trib River Roe
Clarehill	40	60		Aghadowey River
Derrychrin	40	60		Ballinderry River
Derryvale	55	75		Torrent River
Knockloughrim	40	40		Trib Moyola
Liscolman	70	50	12.5	Trib Stracam River
Martinstown	40	60		Ballinderry
Savelbeg	20	20	15	Trib Clanrye River

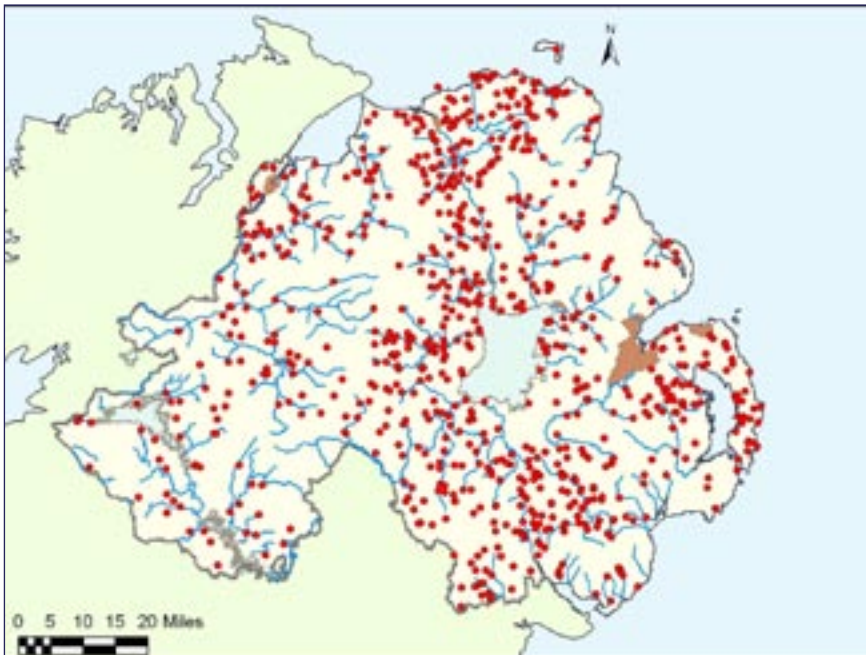
EHS is working towards placing all WWTWs on the Public Register. Those WWTWs with pe greater than 250 (**Figure 5**) will have numeric discharge standards. WWTWs with pe less than 250 (**Figure 6**) will be issued primarily with descriptive standards detailing the level of treatment and maintenance required to ensure good performance and effluent quality. **Figures 5** and **6** also serve to illustrate the disproportionate number of works serving less than 250 pe as compared with those serving above 250 pe. This is a characteristic of the demographics of Northern Ireland and is less prevalent in the rest of the UK.

**Figure 5: Distribution of WWTWs serving pe greater than 250**



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**Figure 6: Distribution of WWTWs serving pe less than 250**

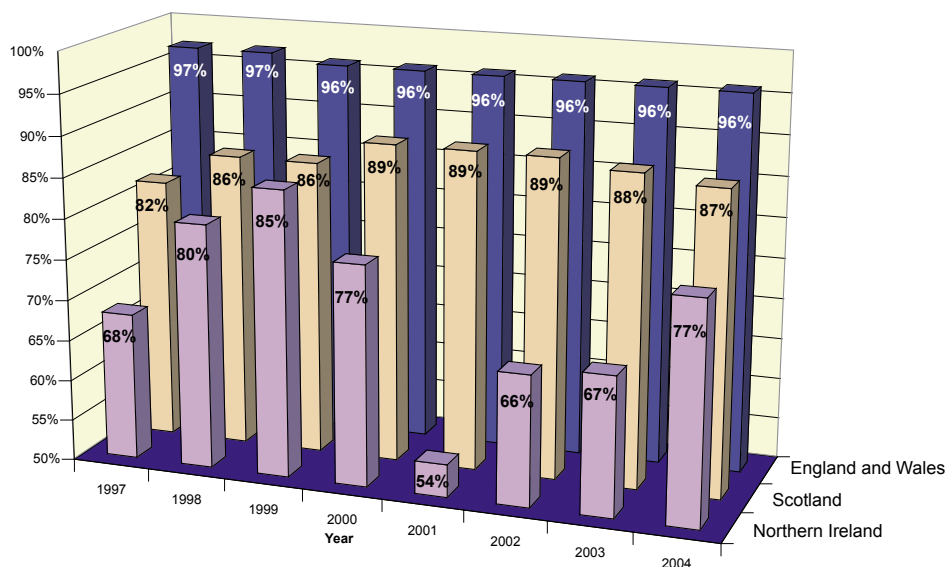


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## WWTW Compliance in the United Kingdom (UK)

Figure 7 shows the compliance trends for WWTWs in England and Wales, Scotland and Northern Ireland. While compliance in Northern Ireland remains lower than in other parts of the UK, recent capital schemes and works improvements carried out by Water Service have resulted in a significant and sustained improvement since 2001.

Figure 7: Percentage Compliance for WWTWs in United Kingdom (UK)





Section 2  
**Compliance with the Urban Waste  
Water Treatment Directive in 2004**

The Urban Waste Water Treatment (UWWT) Regulations (Northern Ireland) 1995 implement the UWWT Directive (91/271/EEC). The Regulations set minimum standards for the treatment of waste water from urban areas before discharge to the aquatic environment. Compliance with the requirements of the Directive is reported to the European Commission under Article 15 of the Directive, through the Department of the Environment Food and Rural Affairs (DEFRA), as part of the UK submission. DEFRA also publishes a 'situation' report under Article 16 of the Directive. The last report, 'Sewage Treatment in the UK,' was published in March 2002. This report summarises the situation in Northern Ireland under the regulations that apply locally.

**Figure 8: Inlet Screens at Belfast WWTW**



In 2004, 35 qualifying treatment works were required to comply with the Regulations (**Figure 9**). Fourteen of these WWTWs discharged to Sensitive Areas (Eutrophic) and were required to have nutrient removal in addition to secondary treatment. A further 21 discharges with pe greater than 15,000 were required to have secondary treatment in place, seven works did not meet this requirement at the end of 2004. (**Appendix D**).

These seven works were:

- Bangor (Briggs Rocks)
- \* Carrickfergus
- \* Culmore
- Donaghadee
- \* Larne (Sandy Bay)
- \* Newtownabbey
- Portrush

The works marked \* should be upgraded by the end of 2006 and the remainder by the end of 2007.



## Performance Results for 2004

The percentage of WWTWs complying with the requirements of the UWWT Regulations (**Table 9**) decreased significantly in 2004 compared with the trend in previous years. The decrease in 2004 results from non-compliance with the monitoring requirements of the Regulations rather than from a deterioration in the effluent quality from the WWTWs. Compliance for WWTWs discharging to Sensitive Areas, for the period 1999 – 2004, is presented in **Table 10**.

The decline in compliance in 2004 can be attributed to an internal reorganisation by Water Service which resulted in non-compliance with the sampling requirements of the Regulations. All WWTWs that were non-compliant as a result of sampling difficulties had met the required effluent quality standard. Compliant WWTWs are listed in **Appendix E**.

**Table 9: Compliance for all UWWT Directive WWTWs 1999-2004**

Year	1999	2000	2001	2002	2003	2004
Number of discharges	15	15	37	35	35	35
Percentage compliance	53%	53%	35%	46%	60%	43%

**Table 10: Compliance for UWWT Directive WWTWs Discharging to Sensitive Areas 1999-2004**

Year	1999	2000	2001	2002	2003	2004
Number of discharges	15	15	15	14	14	14
Percentage compliance	53%	53%	60%	60%	79%	29%

## Reasons for Non-compliance

Apart from those works that did not meet the monitoring requirements, the reasons for non-compliance in 2004 remain the same as in the 2001 report. There are a number of WWTWs (**Appendix D**) that do not have the required level of treatment to comply with the Regulations. All these WWTWS are the subject of capital works schemes to provide the required treatment as soon as practicable and the work should be completed at all works by the end of 2007.

The WWTWs in **Table 11** did not meet the requirements of the UWWT Regulations in 2004, for the reasons indicated. The table does not include the seven works previously listed as being unable to provide the required secondary treatment.

**Table 11: WWTWs Non-Compliant with the standards of the UWWT Regulations in 2004**

Name of Works	Failing Parameter					
	Biochemical Oxygen Demand 95%ile Limit (25mg/l)	Biochemical Oxygen Demand Upper Tier (50mg/l)	Chemical Oxygen Demand 95%ile Limit (125mg/l)	Chemical Oxygen Demand Upper Tier (250mg/l)	Total Phosphorus Annual Average	Insufficient Samples Taken
Armagh						×
Ballyclare					×	
Ballymena		×		×		
Ballymoney (Glenstall)		×		×		
Ballynacor						×
Banbridge						×
Bullays Hill						×
Coleraine		×				
Cookstown		×	×	×	×	
Magherafelt		×				
Moygashel						×
Omagh	×	×	×	×		
Tandragee						×

Standard does not apply



## Section 3

# Collection Systems

EHS and Water Service work together in a number of project groups to identify and rectify unsatisfactory Combined Sewer Overflows (CSOs), and to both rationalise sewer systems and limit the pollution of receiving waters due to storm water overflows.

As part of this process Water Service is rapidly developing Drainage Area Plans (DAPs). DAPs provide information on the location and operation of CSOs within a sewer system. EHS assesses this information, in conjunction with field investigations, to assess the environmental impact, to determine which CSOs are unsatisfactory, to verify the discharge location and to identify the level of assessment required. Urban Pollution Management (UPM) Manual methodology is employed in assessing proposed improvements especially where a full UPM study is considered necessary. The information gathered is used to specify the degree of sophistication of the study and the environmental objectives to be met. **Appendix F** gives an update of progress to the end of 2005.

### Figure 10: A discharging CSO



By the end of 2005, upgrading of the sewerage systems serving WWTWs in 6 areas had been completed, with construction on-going in a further 9 areas.

Detailed UPM studies have been completed in respect of a number of sewerage systems including Belfast (Duncrue Street system), Belfast (Kinnegar system), Enniskillen, Omagh, Cookstown, Ballymena and Portadown/Craigavon with construction in progress at both Belfast (Duncrue Street) and Enniskillen.

Agreement has been reached, in principle, on the upgrading requirements for a further 10 sewerage systems, and 46 upgrades are currently under discussion as part of a formal process of agreement. Negotiations on upgrading proposals for sewerage systems serving a further 34 WWTWs will take place in 2006 as part of the planned programme of work provided

by Water Service. Preliminary fieldwork and data gathering for a number of these sewer systems have taken place but further work will depend on the information obtained from initial DAPs drawn up between EHS and Water Service.

The Water Service Belfast Sewer Project commenced in September 2004 and involves construction and improvements to the existing sewerage system, with the aim to improve water quality in the River Lagan (**Figure 11**) and the Blackstaff and reduce urban flooding.

**Figure 11: River Lagan at Laganside**



The map in **Figure 12** illustrates those urban areas that have been or will be assessed in relation to the design and operation of their sewer system to meet the requirements of the Urban Waste Water Treatment Directive. The areas identified are those greater than 1000 pe for which Water Service is developing a detailed plan of the system and the assets.

The plans require the development of hydraulic models of the systems in order to assess performance and to develop and test improvements. The performance of such systems is tested using expected rainfall patterns to predict the volume and frequency of overflow discharges to the receiving waterways. The overflow information generated is used to assess the environmental impact on the receiving waters against the water quality objectives established by EHS, in order to limit the pollution of these waters by storm water overflows.

**Figure 12: Map of Drainage Area Studies Being Assessed by EHS**



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## Section 4

# **Water Treatment Works**

The treatment of water at WTWs for public supply generates effluents that are often discharged to nearby waterways. EHS determines discharge standards for Water Service WTW effluents to protect the receiving water.

Compliance data for the period 1998 to 2004 show a general trend of improvement. However, there has been a slight decline in 2003 and 2004 (**Table 12**). The decrease in compliance for 2004 can be attributed to inadequacies within the Water Service sampling and reporting arrangements during its reorganisation in 2004.

**Table 12: WTW Compliance 1998 - 2004**

	1998	1999	2000	2001	2002	2003	2004
Number of discharges monitored	22	26	24	27	26	27	30
Number of discharges complying	4	8	11	13	13	12	12
Percentage of discharges complying	18%	31%	46%	48%	50%	44%	40%

Specific details on the compliant and non-compliant WTW discharges for 2004 can be found in **Appendix G**.

**Figure 13: Altnaheglish Reservoir Serving Caugh Hill WTW**





## Section 5

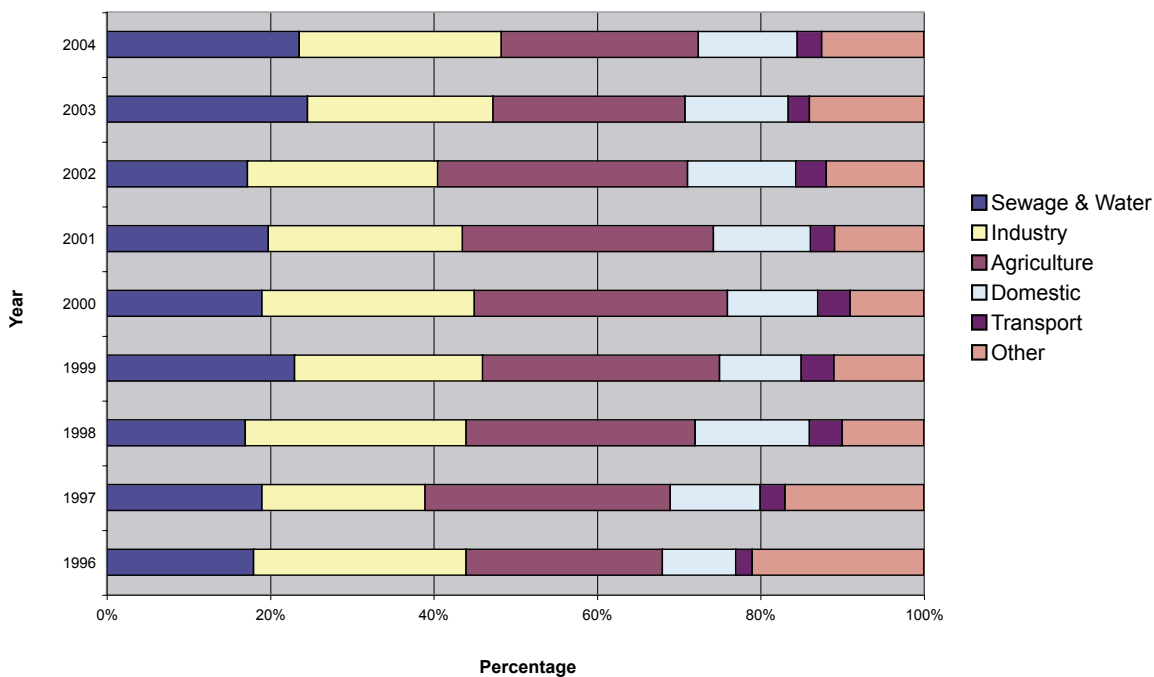
# **Pollution Incident Investigation**

The Water Management Unit of EHS is responsible for investigating and monitoring pollution incidents caused by unauthorised discharges. Water Pollution Incident and Prosecution Statistics reports are published each year. The 2004 Report on 'Water Pollution Incidents and Enforcement' is available on the EHS website at:

[http://www.ehsni.gov.uk/pubs/publications/Water\\_Polln\\_Stats\\_2004\\_Webver\\_1.12.05.pdf](http://www.ehsni.gov.uk/pubs/publications/Water_Polln_Stats_2004_Webver_1.12.05.pdf)

The data shown in **Figure 14** are taken from this report and show that Water Service continues to contribute to around 20% of pollution incidents annually.

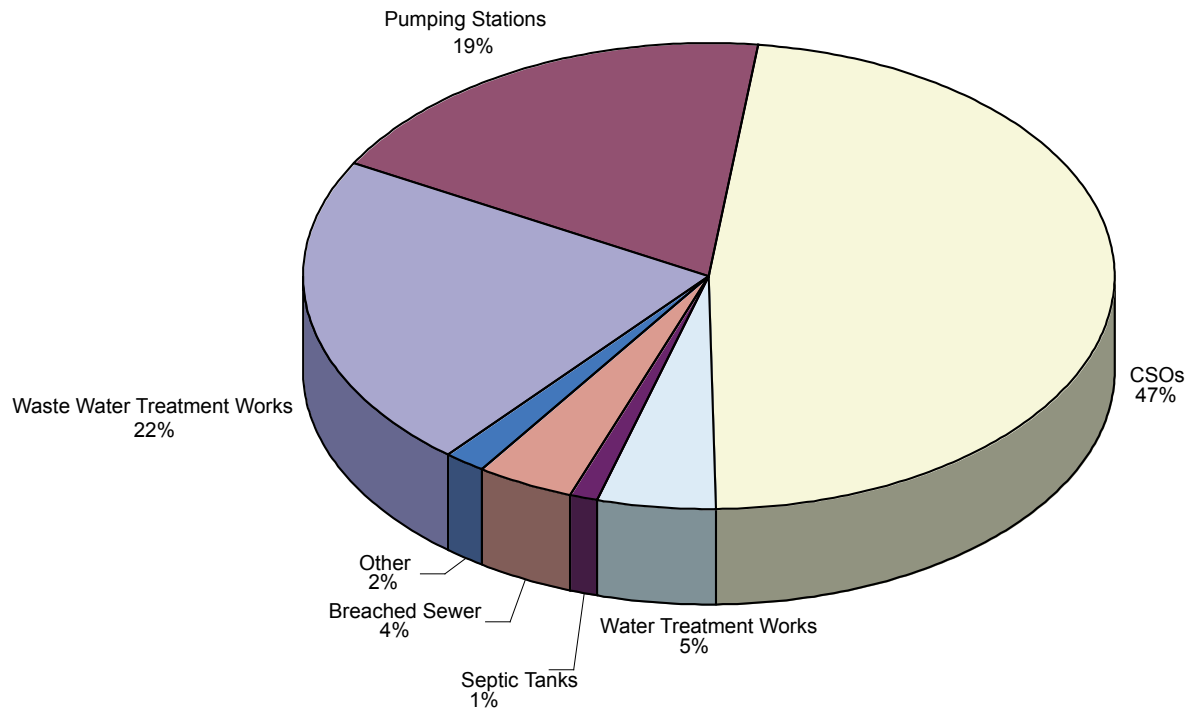
**Figure 14: Substantiated Pollution Incidents 1996-2004**



In 2001 there were 305 confirmed pollution incidents attributed to Water Service. This increased to 364 in 2003, but fell to 289 in 2004. While the number of incidents attributed to Water Service varies from year to year the total number of incidents is around 20% of the total. **Figure 15** shows the percentage distribution of the activities undertaken by Water Service which resulted in the pollution incidents attributed to them in 2004.

**Figure 15: Distribution of Sources of Pollution Arising from Water Service Activities in 2004**

**2004**





## Section 6

# Current and Future Performance

The regulatory controls in place have been effective in identifying the need for improvement and in targeting investment to increase compliance with statutory European and national environmental standards in order to protect the environment. EHS accepts that there is still much to be done and will continue to strive for higher levels of investment in sewerage infrastructure to deliver water quality standards that are consistent with the rest of the UK and Europe. To this end EHS aims to:

- determine environmental needs standards for all WWTWs and place them on the Public Register when complete;
- review the standards for all WWTWs to meet the requirements of the UWWT Directive;
- place standards for over 800 WWTWs with a pe less than 250 on the Public Register; and
- continue to monitor and report on compliance with national and European standards.

### Investment in WWTWs

Over the three year period to 2007/08, some £290 million will be invested in upgrading WWTWs to ensure compliance with EC Directive standards. Work has commenced on the new North Coast WWTW to resolve compliance requirements at Portrush, Portstewart and Coleraine. This £42 million project is in addition to other recently completed work at Newry, Ballymena, Strabane and Banbridge. Considerable progress has already been made with treatment works such as Larne, Omagh, Londonderry, Cookstown and Ballyclare, which are due for completion in the 2005/06 financial year. **Appendix B** shows the status at a number of works as of December 2005.

In addition, Water Service is actively pursuing the use of Public Private Partnership investment to complement conventionally funded programmes. Initial PPP programmes for wastewater and sludge treatment, currently estimated at some £122 million, are being taken forward for detailed planning and procurement.

### Sewerage Systems

Investment is also planned to upgrade the sewerage network in Northern Ireland. It is estimated that over £400 million will be required over the next 10 years. This is being managed via a programme of 108 Drainage Area Studies and the production of Drainage Area Plans leading to the inclusion of projects in Water Service's capital investment programme. Included in this programme is the recently commenced Belfast Sewer Project, a £100 million contract to upgrade the Victorian sewerage network in Belfast. **Appendix F** shows the status of the sewerage system upgrades as of December 2005.

## Future WTW Compliance

It is anticipated that further improvements in the quality of effluent discharges from WTW will be achieved as these are upgraded to meet the requirements of the EC Drinking Water Directives. To achieve this, Water Service plans to invest some £200 million on its WTWs and distribution system in the 3-year period to 2007/08.

Recently commissioned new treatment plants, such as the Drumaroad WTW (treating Silent Valley water), are ensuring steady progress towards full compliance with EC Directive standards. Work is also under way at Carran Hill WTW, near Crossmaglen, and at Fofanny WTW, located beside Fofanny Dam in the Mourne area. This is in addition to work already completed to upgrade the water treatment facilities at Lough Fea (Cookstown area), Derg (Castledearg area), and Lough Macrory (Omagh area).

In addition, Water Service is actively pursuing the use of Public Private Partnership investment to complement conventionally funded programmes. Initial PPP programmes for water treatment, currently estimated at some £154 million are being taken forward for detailed planning and procurement.



## Appendices

## Appendix A

### Summary of WWTWs that did not meet their Registered Standard in 2004

Station	BOD		Suspended Solids		Ammonia		Total Phosphorus
	95%ile	U/T	95%ile	U/T	95%ile	U/T	Annual Average
Aghagallon	×		×				
Aghalee	×		×				
Antrim					×		
Ardglass	% red		% red				
Aughnacloy	×		×				
Ballyclare							×
Ballymena Bf	×	×	×	×			
Ballymoney Glenstall	×	×	×	×			
Ballymonie	×		×				
Ballynure					×		
Ballystrudder	×		×				
Bangor	×	×	×				
Belleeks (Armagh)			×				
Bullays Hill							×
Campsie	×		×				
Carrickfergus	×	×	×				
Carrowdore	×		×				
Clady (L'derry)	×		×				
Clady (Tyrone)	×						
Coleraine	×	×					
Cookstown	×		×				×
Corkey					×		
Crossgar Bf	×						
Culmore	×	×	×				
Donaghadee	×	×	×				
Dromara					×		
Drumavalley	×		×				
Dundrum			×				
Glenavy	×						
Hamiltonsbawn			×				
Kilcoo	×		×		×		

Station	BOD		Suspended Solids		Ammonia		Total Phosphorus
	95%ile	U/T	95%ile	U/T	95%ile	U/T	Annual Average
Killen	×		×				
Kilrea	×						
Larne	×	×	×				
Lisbarnet					×		
Magherafelt		×			×		
Moneyreagh			×				
Moygashel						×	
Mullanahoe		×					
Newtownabbey	×	×	×				
Newtownbreda			×	×			
Newtownbutler				×			
Omagh	×	×	×	×			
Plumbridge	×						
Portglenone			×				
Portrush	×	×	×				
Raholp	×		×				
Rathfriland	×	×	×	×	×	×	
Sandholes	×						
Spa	×				×		
Strabane		×					
Strangford	No results returned						
Tandragee	×	×	×	×			×
Tullagharley				×			
Victoria Bridge	×		×				
Waringstown					×		
Whitecross			×				

**Key:**

- × non-compliance with standard
- Standard does not apply
- 95% 95-percentile standard
- U/T Upper tier standard
- % Red Percentage reduction standard

# Appendix B

## Updated WWTWs Status as at December 2005

Name WWTW	Details
AGHAGALLON	A new membrane bioreactor (MBR) WWTW has been commissioned.
AGHALEE	A new membrane bioreactor (MBR) WWTW has been commissioned.
ANTRIM	Water Service is considering options for future wastewater treatment provision for Antrim.
ARDGLASS	Water Service intends to install temporary treatment to serve Ardglass while options for future provision are considered.
AUGHNACLOY	New works commissioned March 2004.
BALLYCLARE	A new membrane bioreactor WWTW is being commissioned.
BALLYMENA	This works has been decommissioned with flows transferred to the new Tullagharley WWTW. Tullagharley WWTW has been fully operational since November 2004.
BALLYMONEY/BALLYBRAKES/GLENSTALL	Construction commenced in late 2005 at Glenstall on a new WWTW to serve the greater Ballymoney area.
BALLYMONIE	Upgraded WWTW operational since 2003.
BALLYNURE	Ballynure WWTW will be decommissioned and flows transferred to Ballyclare for treatment when construction on the connecting pipework is complete.
BALLYSTRUDDER	An appraisal study is ongoing to consider the long term treatment solution for Ballystrudder, Ballycarry and Whitehead. This study is due for completion in Spring 2006 with procurement to follow as soon as possible.
BANGOR	Upgrade is due for completion by the end of 2007 as part of the North Down Scheme.
BELLEEK (ARMAGH)	Additional temporary treatment has been installed at this WWTW to improve performance.
CAMPSIE	The works has been decommissioned and a pumping station has been constructed to transfer flows to Donnybrewer for treatment.
CARRICKFERGUS	Construction is underway on a new secondary treatment works.

CARROWDORE	Additional temporary treatment has been installed at this WWTW to improve performance.
CLADY (LONDONDERRY)	This works was decommissioned at the end of 2004 and flows transferred to the new Portglenone WWTW.
CLADY (TYRONE)	Additional temporary treatment has been installed at this WWTW to improve performance.
COLERAINE	Construction has commenced on the new North Coast works. Coleraine works will close once the new works is operational in mid 2007.
COOKSTOWN	Construction of the new Cookstown WWTW is nearing completion and the new works is already partially operational.
CORKEY	A temporary treatment plant has been installed to improve performance at this works.
CROSSGAR	This works has been decommissioned with flows transferred to Killyleagh for treatment.
CULMORE	Construction is nearing completion on the new Culmore WWTW and the works is already 80% operational.
DONAGHADEE	Upgrade is due for completion by the end of 2007 as part of the North Down Scheme.
DROMARA	Improvements at this works are planned for completion in 2007. Water Service indicated the works was adversely affected by unconsented trade effluent discharges.
DUNDRUM	Upgrade of this works is due to be completed by the end of 2005.
DRUMAVALLEY	This works is due to be decommissioned with sewage flows transferred to Benone WWTW.
GLENAVY	The new Glenavy WWTW was commissioned during December 2005.
HAMILTONSBAWN	This works is due to be decommissioned with sewage flows transferred to Markethill WWTW.
KILCOO	A new rotating biological contactor (RBC) WWTW is being commissioned.
KILLEN	Secondary treatment has been refurbished.
KILREA	Improvements to this works are planned for completion in 2008. Water Service indicated the works was adversely affected by unconsented trade effluent discharges.

LARNE	Construction is nearing completion on the new Larne WWTW. The works is scheduled to be operational by mid 2006.
LISBARNET	Additional temporary treatment has been installed at this WWTW to improve performance.
MAGHERAFELT	The discharge was diverted to the Moyola River early in 2005 and Water Service is considering options for the future provision of wastewater services in Magherafelt.
MONEYREAGH	The final phase of upgrading for this works is due for completion by mid 2006.
MULLANAHOE	Water Service is seeking to address the difficulties caused by high storm flows which adversely affect this works.
NEWTOWNABBEY	Construction is underway on a new secondary treatment works.
NEWTOWNBREDA	Improvements to this works and nutrient removal capacity are due to be provided by 2007.
NEWTOWNBUTLER	Water Service attributed the non-compliance at this works to difficulties with the operation of the reed bed system.
OMAGH	The new works is currently being commissioned.
PLUMBRIDGE	Additional temporary treatment has been installed at this WWTW to improve performance.
PORTGLENONE	The new Portglenone WWTW has been fully operational since November 2004.
PORTRUSH	Construction has commenced on the new North Coast works. The Portrush discharge will close when the new works is operational in mid 2007.
RAHOLP	Water Service is seeking to address the difficulties caused by high storm flows which adversely affect this works. Options for this works are under consideration. Upgrading or pumping away to Downpatrick WWTW are options.
RATHFRILAND	Construction of the new Rathfriland WWTW is nearing completion.
SANDHOLES	This works will be decommissioned and flows transferred to the upgraded Cookstown WWTW when it is fully operational.
SPA	This works will be decommissioned in 2006 with flows transferred to Drumaness WWTW.
STRABANE	The new works is now operational and will have nutrient removal capability provided in 2006.

TANDRAGEE	Construction is underway on a new secondary treatment works.
TULLAGHGARLEY	The new Tullaghgarley WWTW has been fully operational since November 2004.
VICTORIA BRIDGE	Water Service indicated the works was adversely affected by unconsented trade effluent discharges.
WARINGSTOWN	The new works is currently being commissioned.
WHITECROSS	This works is currently being decommissioned with sewage flows transferred to Mountnorris WWTW.

## Appendix C

### WWTWs with flow measurement

WWTW	
Armagh	Magherafelt
Ballinacor	Kircubbin
Ballyclare	Limavady
Ballymoney	Lisnaskea
Ballyrickard	Milltown
Belfast	Moira
Bullays Hill	New Holland
Carrickfergus	Newcastle
Coleraine	Newry
Culmore	Newtownabbey
Dunmurry	Newtownbreda
Glenstall	Omagh
Greenisland	Silverhill
Greyabbey	Spencetown
Banbridge	Strabane
Kilkeel	Tullaghgarley
Cookstown	

## Appendix D

### WWTWs not providing the Level of Treatment Required by the UWWT Regulations in 2004

Works	Current Treatment	Required Treatment	Date Required	Time-scale for Upgrade/ Replacement
Bangor (Briggs Rocks)	Preliminary	Secondary	31:12:2000	Upgrade is due for completion in 2007 as part of the North Down Scheme.
Ballyclare	Secondary	Tertiary	31:12:1998	Construction of new works completed late 2005
Carrickfergus	Primary	Secondary	31:12:2000	Upgrade due for completion 2006
Cookstown	Secondary	Tertiary	31:12:1998	Construction of new works to be complete late 2006
Culmore	Primary	Secondary	31:12:2000	Construction of the new works completed late 2005
Donaghadee	None	Secondary	31:12:2000	Upgrade is due for completion in 2007 as part of the North Down Scheme.
Larne (Sandy Bay)	None	Secondary	31:12:2000	New works due to be commissioned mid-2006
Newtownabbey	Partial Secondary	Secondary	31:12:2000	Upgrade scheduled for completion mid-2006
Portrush	None	Secondary	31:12:2000	Upgrade as part of the North Coast Scheme commenced early 2005, with completion due in 2007

## Appendix E

### WWTWs compliant with UWWT Regulations in 2004

Compliance 2004
Antrim
Ballymoney (Ballybrakes)
Ballyrickard
Belfast
Dunmurry
Enniskillen
Kilkeel
Limavady
New Holland
Newcastle
Newry
Newtownbreda
Seagoe
Strabane
Tullaghgarley

## Appendix F

### Status of Sewerage System Upgrades - December 2005

Construction Complete	Construction On-going Agreement Reached	Agreement Reached in Principle on Drainage Area Study	Drainage Area Study Ongoing	Due in Future
Cushendall Cushendun Glenarm Helen's Bay Larne Portstewart	Ballyclare Ballymoney Banbridge Belfast (Duncrue System) Downpatrick Enniskillen Newry Portrush Rostrevor	Cookstown Dundrum Dunmurry Hillsborough Limavady Londonderry Maghera Moirá Portadown/Craigavon Strabane	Annalong Antrim Armagh Ballycastle Ballyhalbert Ballymena Ballywalter Bangor Belfast (Kinnegar System) Bessbrook Carrickfergus Castlerock Cloghy Coalisland Coleraine Donaghadee Draperstown Gilford Greencastle Greenisland Greyabbey Kilkeel Kircubbin Lisburn Lurgan Maghaberry Magherafelt/Castledawson Magheralin Markethill Millisle Moneymore Newcastle Newtownbreda Omagh Portaferry Portavogie Portglenone Randalstown Rathfriland Richill Seahill Tandragee Waringstown Warrenpoint Whitehead Whitehouse	Annahilt Ardglass Ballycarry Ballygowan Ballykelly Ballynahinch Ballyrickard Ballystruder Bellaghy Bushmills Castledearg Castlewellan Crossgar Crossmaglen Dromore Dungannon Dungiven Eglinton Fintona Fivemiletown Garvagh Glenavy Greysteel Irvinestown Keady Killyleagh Kilrea Lisnaskea New Buildings Newtownstewart Portballintrae Saintfield Sion Mills Upper Falls

# Appendix G

## Compliant with WTW Discharges in 2004

WTW
Glenhordial
Killea
Belleek
Killyhevlin
Dunmurry
Derg
Dunore sludge beds
Forked Bridge RGF
Silent Valley
Creightons Green
Dungonnell
Killylane
Lough Feagh

## Appendix G cont...

## Non-Compliant WTW Discharges in 2004

Name or Works	Suspended Solids	Total Aluminium	Soluble Aluminium	Total Iron	Soluble Iron	Chlorine	BOD	pH	Insufficient Sample Results
Caugh Hill									×
Carmoney									×
Ballysallagh Upper									×
Dorisland						×			
Dunore Settlement	×						×		
Forked Bridge Sand Washer								×	
Lough Cowey	×	×							
Conlig	×								×
Lough Island Reavey	×	×						×	
Carron Hill						×			×
Seagahan						×			×
Clay Lake						×			×
Ballymaconaghy									×
Altmore						×			×
Castor Bay Lagoon						×			×
Castor Bay Sandwasher	×					×			×
Ballintemple	×					×			×
Ballinrees	×	×							

# Glossary

Ammonia/Ammonium (NH <sub>4</sub> )	A chemical found in water often as a result of pollution by sewage effluents. High levels can adversely affect fish.
Biochemical Oxygen Demand (BOD)	A measure of polluting potential – BOD is a measure of the amount of oxygen required by bacteria or algae to break down the organic biodegradable material in sewage or effluent.
Combined Sewer Overflow (CSO)	Channels which act as sewers during normal flow conditions. Under high flow conditions, such as during or after storms, these channels can either direct increased flows to storm-water storage tanks to prevent sewage treatment works being overloaded or to allow storm waste water to flow into surface waters.
Discharge Standard	A standard issued by EHS to permit discharge of effluent to a water body. The standards lay down conditions in order to minimise effects on the receiving water. Registered standards usually specify the location of the discharge and the total volume of effluent permitted together with the appropriate quality conditions, such as the effluent's biochemical demand and where relevant may include suspended solids, ammonia, metals or certain toxic substances.
Effluent	Discharge from a sewage or water treatment works.
Eutrophic	Waters which have been affected by eutrophication.
Eutrophication	Enrichment of waters through the presence of nutrients, especially nitrogen and/or phosphorus compounds, causing accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned.
mg/l	milligrams per litre – a measure of the concentration of a substance in liquid.
Outfall	Sewage discharge point – the structure or pipe that conveys the effluent to the receiving water for discharge.
Percentile Limit	A numeric limit that must be achieved or bettered for at least some stated percentage of time over a specified assessment period. A 95 percentile limit must be met for at least 95-percent of a specified time period, for example, 1 year (see Look-up table).
Population equivalent (pe)	A measure of the organic biodegradable load where a population equivalent (1 pe) is equal to a biochemical oxygen demand of 60g of oxygen per day.

Preliminary treatment.	The most basic treatment that sewage can receive: employing screening to remove visible solids and grit removal.
Primary treatment	Treatment of sewage by a physical and/or chemical process involving the settlement of suspended solids, or other processes in which the biochemical oxygen demand of the incoming sewage is reduced by at least 20% before discharge, and total suspended solids of the incoming sewage are reduced by at least 50%.
Public Register	Record of consents and analysis of effluents and waters that are available for inspection by any member of the public. The Register is can be viewed at Calvert House, Belfast.
Receiving Water	Body of water receiving effluent.
Secondary Treatment	A higher level of treatment (than provided by primary treatment) of sewage by a process generally involving a biological process followed by clarification or other process, in which the UWWT Directive's treatment standards for biochemical oxygen demand, chemical oxygen demand and suspended solids are respected. Secondary treatment is the normal standard for treatment of discharges under the Regulations.
Sewage Treatment Works / Waste Water Treatment Works	Plant where sewage/waste water is received for treatment.
Sewage (or urban waste water)	Generally a mixture of domestic waste water (from toilets, baths, sinks, and washing machines) with industrial waste water and/or run-off.
Sewage or sewerage collection system	A system of pipes and ducting which collects and transports sewage.
Suspended Solids	Solid matter, including food waste, faeces, condoms and sanitary items found in sewage that can be removed by settlement.
Tertiary or "more stringent" treatment.	A further level of treatment to secondary, involving the removal of specific polluting matter such as: nutrients (nitrogen and/or phosphorus), micro-organisms or toxic substances.
Treatment levels	Sewage is treated to various levels: they are: preliminary, primary, secondary and tertiary. Each level of treatment following preliminary treatment builds on the previous treatment level.
UKAS	United Kingdom Accreditation Service. An accreditation body that ensures that quality standards are met for both analysis and measurement.

## Upper Tier Standard

An absolute limit, generally a multiple of the 95-percentile limit, that may be included with the 95-percentile in the discharge standard for sewage treatment works.

## Water Treatment Works (WTW)

Plant where a natural water source is treated to provide drinking water for domestic consumption.

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*Our aim is to protect and conserve the natural and built environment and to promote its appreciation for the benefit of present and future generations.*

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