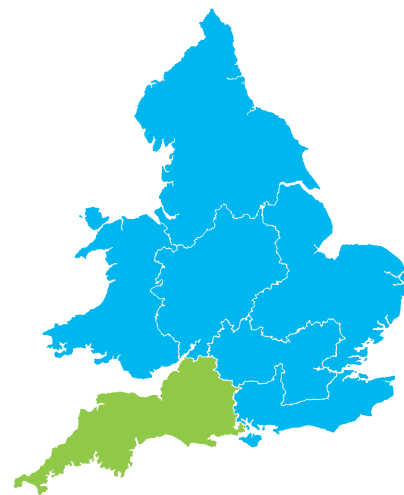


Drinking water 2008

Western region of England

July 2009

A report by the Chief Inspector of Drinking Water





Drinking water 2008

Western region of England



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Drinking Water 2008 is the annual report of the Drinking Water Inspectorate and comprises a number of parts.

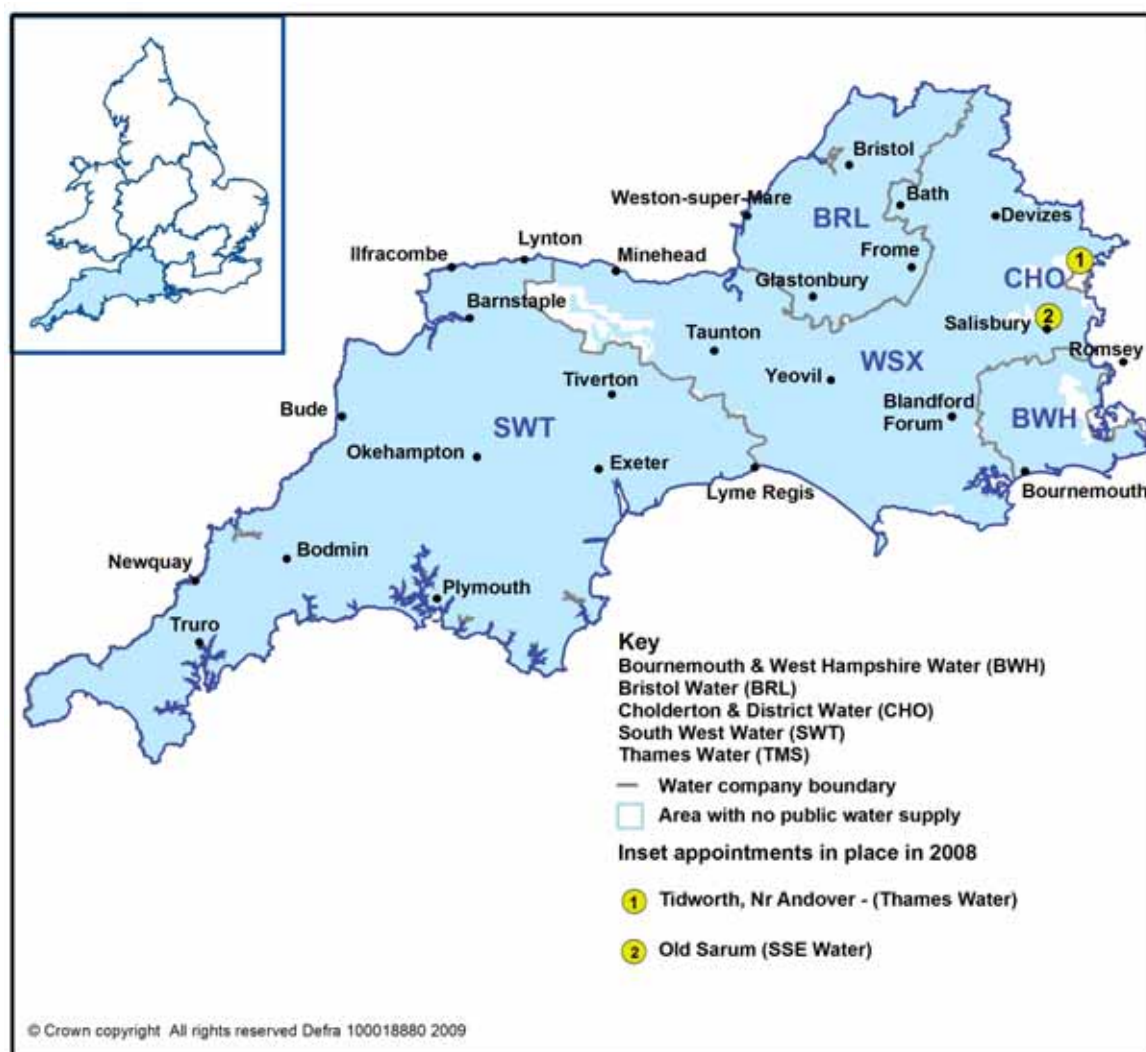
This part describes drinking water quality in the Western region. The Inspectorate also publishes a series of companion reports for other regions of England (Central, Eastern, Northern, Southern and Thames regions) and a separate report for Wales.

All parts are available on the Inspectorate's website <http://www.dwi.gov.uk> and on the CD accompanying this report along with separate summary data for water company sampling programmes.

Introduction to the report for the Western region

Drinking Water 2008 is published as a series of seven reports covering Wales and the six regions of England. Each report presents information about drinking water quality in a form that meets the needs of those who have an interest in the quality and safe management of drinking water supplies from the consumer perspective, namely the local authorities and the regional committees of the Consumer Council for Water.

The report describes the key facts about the quality of drinking water in the Western region, which is served by five water companies (Bournemouth and West Hampshire Water, Bristol Water, Cholderton and District Water, South West Water and Wessex Water) delivering public water supplies to over four million consumers.



Three inset appointments were in operation in 2008; Thames Water supplying consumers in the Tidworth area and SSE Water began supplying water in Old Sarum, Salisbury during 2008. Northern Foods at Trowbridge ceased trading in 2008 and Wessex Water are responsible for the supplies to the redeveloped site.

The results of testing in 2008 demonstrated that the overall quality of drinking water in the Western region was good. The figure for compliance with drinking water standards at consumers' taps was 99.96% slightly down the figure of 99.97% recorded in 2007. This figure is made up of the results of all the tests for 39 parameters¹ with European or national standards. The circumstances of the few failures and the actions taken to safeguard public health are discussed in the main body of the report.

At water treatment works in 2008 there were fewer detections of coliform bacteria, although no change in respect of *E.coli* and similar results for turbidity, as compared to 2007. The measurement of these three parameters verifies how well water companies are achieving their primary duty of making sure that all water is microbiologically safe before it is supplied to consumers. The Inspectorate has noted that quite a few of the turbidity failures were associated with the start up of pumps at borehole sites resulting in unrepresentative sample results. Such problems are avoidable and companies should do more to minimise their occurrence.

The microbiological quality of treated water stored in service reservoirs was better in respect of the number of detections of coliforms in 2008, however, there were more *E.coli* failures (nine compared to two in 2007). The purpose of this testing is verification that the quality of treated water held in these strategic storage structures is not being compromised as a consequence of the maintenance of the reservoir or its configuration. Checks at most of the failed sites uncovered problems with sample lines or reservoir integrity. The Inspectorate expects companies to take a proactive approach to preventing such problems. For example, continuous review of other data can provide early warning of situations which, if left unattended, are likely to result in failures.

Although there was only one sample failing the current standard for lead in 2008, this year companies have detected more samples, concentrated largely in the Bath and Bristol areas, above the future standard for lead. The Inspectorate has issued guidance to companies on the actions they need to be taking between now and 2013. Companies in the region have included an integrated package of measures in their final business plans (PR09) to address the risk to consumers of exposure to lead at levels above the future standard. The measures include targeted lead

¹ For 2008 the calculation is based on 39 parameters, in previous years this was 40 parameters. The pH parameter is no longer a national standard.

communication pipe replacement in high risk areas, joint action with local health professionals (Health Protection Agency and Primary Care Trusts) to address the risk to vulnerable consumers and to educate consumers on the benefits of lead pipe replacement, opportunistic lead communication pipe replacement as part of pre-planned work on the distribution system and lead communication pipe replacement at a property where a sample result fails the future standard of 10µg/l. Additionally, Bristol Water have included a scheme for enhancing treatment of raw water for lead.

During 2008, metaldehyde, the active ingredient of some slug pellets, has been identified by Bristol Water and Wessex Water as a new pesticide hazard in some water sources in the region. A similar situation has been reported elsewhere in the country by Anglian Water, Essex and Suffolk Water, Severn Trent Water, South East Water, Southern Water, South Staffordshire Water, Sutton and East Surrey Water, Three Valleys Water and Thames Water. The Health Protection Agency has advised that no adverse health effects are expected from the levels found. The Inspectorate has initiated enforcement action to enable the companies to develop and implement catchment management control with the Environment Agency, other regulators and other stakeholders to minimise the occurrence of this pesticide in raw water sources in the Western region.

Companies in the Western region notified the Inspectorate of 62 events of which 19 were classified as water quality incidents requiring an independent investigation by the Inspectorate. Overall, there were more incidents in 2008 compared to the 10 recorded in 2007. Those that were noteworthy and are reviewed in the main body of the report include a power failure at a large treatment works, a herbicide failure at a consumer's tap which turned out to be an analytical error and an incident where mistakes were made in the relining of a water main. A summary of the nature, cause and duration of all incidents in the region in 2008 is set out in *Annex 3*.

Compared to 2006, fewer consumers in the Western region reported a problem with the quality of drinking water at the tap in their home or workplace. In particular, fewer customers of South West Water reported 'dirty' water with an 80% reduction in discolouration contacts in some zones. This is largely due to the progress made with the company's long-term section 19 mains renovation work programme which has resulted in fewer failures of the iron and manganese standard this year. By contrast, and disappointingly, this type of contact shows a rising trend in the Wessex Water supply area (up by 29% since 2006). The Inspectorate expects companies to be using consumer contact data to continuously review and improve their Distribution, Operation and Maintenance Strategies.

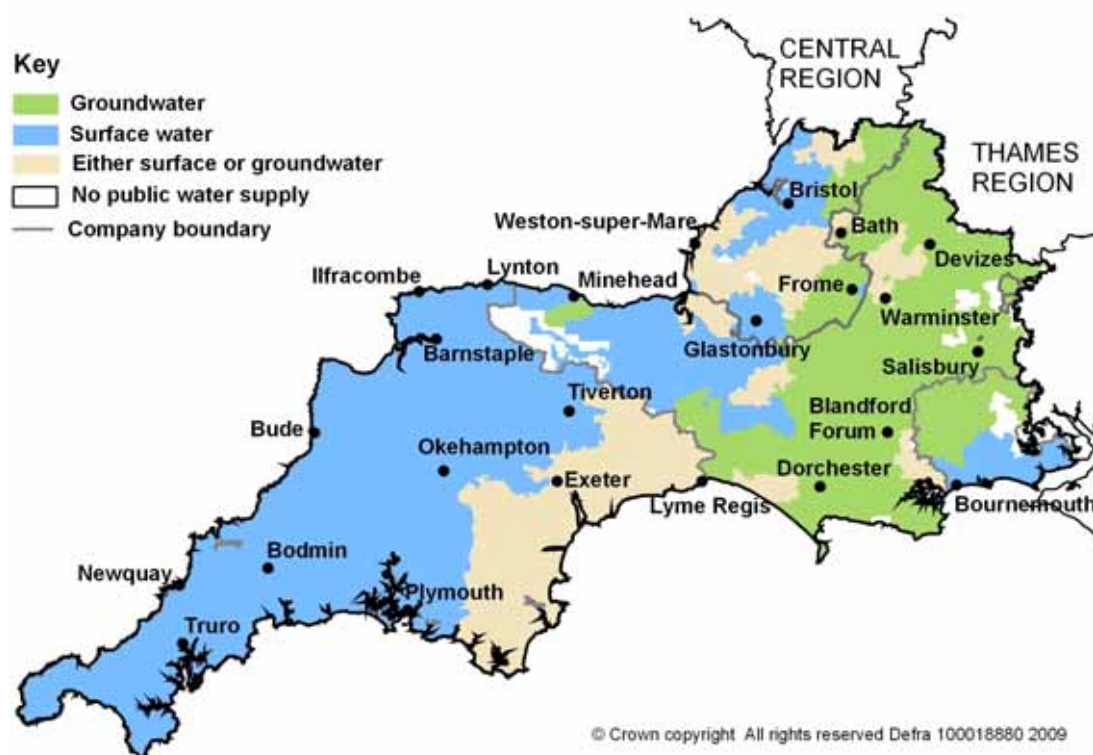
The Inspectorate received fewer complaints from consumers in the Western region, eight in 2008 compared to 11 in 2007. The case of one customer of Bristol Water, reviewed in the report, highlights the intermittent nature of certain types of water quality problem and the benefits to be gained from proactive customer education about how to look after water in the home.

During 2008, over 570,000 consumers in the Western region benefited from improved drinking water quality through the completion, by companies, of two schemes of work to address deficiencies in raw water in relation to manganese, arsenic and taste and odour at three works.

Water supply arrangements

Five water companies supply drinking water in the Western region: Bournemouth and West Hampshire Water (BWH), Bristol Water (BRL), Cholderton and District Water (CHO), SSE Water (SSE), South West Water (SWT) and Wessex Water (WSX). Additionally, three inset appointments were in operation in 2008; Thames Water supplying consumers in the Tidworth area and SSE Water (SSE) began supplying water in Old Sarum, Salisbury during 2008. Northern Foods at Trowbridge ceased trading in 2008 and. Wessex Water are responsible for the supplies to the redeveloped site

Figure 1: Map illustrating sources of drinking water by zone across the region



Much of the water in the region is derived from surface water (67%) abstracted from rivers such as the Severn, the Hampshire Avon, Dart, Exe, Fowey, Tamar and the Dorset Stour. There is a major transfer of water into the region via the river Severn from reservoirs in Wales which provide half of the daily supply for consumers in the Bristol Water area. Additionally, the upland areas of Bodmin Moor, Dartmoor, Exmoor and the Mendips are important catchments for water resources in the region. Surface water is drawn from many reservoirs, including Chew Valley Lake, Clatworthy, Colliford, Roadford and Wimbleball. Groundwater provides a valuable resource (28%) of the region's water, with many boreholes

drawing water from the chalk aquifer of the Wessex basin, but the Permian and Triassic sandstone aquifer in the Otter Valley is also an important groundwater source for East Devon. Cholderton and District Water, the smallest public water supply company in England, relies exclusively on the chalk aquifer of the Wessex basin. Across the region, a small proportion of water supplies (5%) can be drawn from either surface or groundwater sources.

Summary facts about the drinking water supply infrastructure of the region are given in Table 2 with outline geographical and demographic information.

Table 2: Key facts about the Western region supply arrangements

Key facts			
Population supplied	4,282,470	Treatment works	156
Water supplied (l/day)	1,194 million	Service reservoirs	816
Number of local authorities	27	Water supply zones	181
(with a further 6 partially covering the region)		Length of mains pipe (km)	35,431
Approximate number of private water supplies	8,996		
Area of supply		Water composition	
Cornwall, Devon, Dorset, Gloucestershire (part), Hampshire (part), Somerset and Wiltshire (part)		Surface sources	67%
		Groundwater sources	28%
		Mixed sources	5%

Drinking water quality testing

Throughout 2008, water companies sampled drinking water across the region to test for compliance with the standards in the drinking water regulations. Just under one-third of the tests were carried out on drinking water drawn from consumers' taps selected at random. For monitoring purposes, company water supply areas are divided into zones based on population (maximum 100,000). Generally, zones are sampled at consumers' taps with the number of required tests being greatest in zones with larger populations. Other sample locations are water treatment works and treated water (service) reservoirs. Collectively, the six water companies carried out a total of 599,041 tests during 2008. Only 152 of these tests failed to meet the standards set down in the regulations.

Table 3: Number of tests carried out by companies in the region

Company	Place of sampling			Number of tests per company	Estimate of population
	Water treatment works	Service reservoirs	Consumers' taps (zones)		
Bournemouth and West Hampshire Water	13,182 (6)	6,275 (20)	17,729 (10)	37,186	426,000
Bristol Water	25,434 (15)	51,492 (165)	39,761 (52)	116,687	1,092,022
Cholderton and District Water	372 (1)	312 (2)	302 (1)	986	2,100
South West Water	56,299 (33)	90,350 (296)	60,315 (23)	206,964	1,571,000
SSE Water	0 (0)	0 (0)	87 (1)	87	89
Thames Water (Tidworth)	1,286 (2)	1,582 (6)	982 (1)	3,850	9,259
Wessex Water	77,563 (89)	94,468 (303)	61,260 (93)	233,291	1,182,000
Region overall	174,136 (146)	244,479 (792)	180,436 (181)	599,051	4,282,470

Numbers in brackets reflect the number of works, reservoirs or zones operated by that company in the region in 2008. Some companies are permitted to carry out some tests on samples taken from supply points rather than from consumers' taps.

The regulations require companies to test for specified parameters at prescribed frequencies. Most of the testing is for parameters with European or national standards, however, water companies are also required by the regulations to test for other parameters, such as ammonium, sulphate and colony counts.

Results of interest are discussed in this report. A full summary of the results of testing by each company can be found on the DWI website

(<http://www.dwi.gov.uk>) and on the CD accompanying this report. The tables summarising the results of testing provide the annual minimum, maximum and mean levels for individual parameters for each company.

Drinking water quality results

The key water quality results for the Western region are presented in two tables, one showing results for microbiological parameters (Table 4), the other dealing with chemical and physical parameters (Table 6).

The microbiological quality of water is discussed first. Companies report all the results of the tests on a monthly basis to the Inspectorate.

A summary of the results of the tests from each company is presented on the Inspectorate's website <http://www.dwi.gov.uk> and is also available on the CD accompanying this report. Additionally, statistics describing the performance of each company in the region are summarised in *Annex 7*.

To protect public health, microbiological standards have to be met at each individual treatment works and service reservoir. The results confirm the overall microbiological safety of drinking water supplies in the region. The significance of the individual test results for each microbiological parameter at each location varies and a single positive result cannot be interpreted without other information. All companies are expected to follow best practice as set out in *The Microbiology of Drinking Water (2002)* published by the Standing Committee of Analysts (SCA) which can be located on the Environment Agency's website at <http://www.environment-agency.gov.uk> under the 'Commercial Services' section.

Microbiological quality

Table 4: Microbiological tests

The number of tests performed and the number of tests not meeting the standard

Parameter	Current standard	Total number of tests	Number of tests not meeting the standard	Additional information
Water leaving water treatment works				
<i>E.coli</i>	0/100ml	23,089	1	BWH (1)
Coliform bacteria	0/100ml	23,089	10	BRL(1),BWH(2), SWT(3), WSX(4)
<i>Cryptosporidium</i> *	< 1 oocyst per 10 litres. Treatment standard (see note)	9,376	0	Monitored at 43 works in the region determined to be at risk out of a total of 146
<i>Clostridium perfringens</i>	0/100ml	5,406	7	BWH (3), SWT (3), WSX (1)
Turbidity**	1NTU	23,029	17	BRL(2),BWH(3), SWT(2),TMS(2), WSX (8)
Water leaving service reservoirs				
<i>E.coli</i>	0/100ml	40,805	9	BRL(1),SWT(4), WSX (4)
Coliform bacteria	0/100ml in 95% of tests at each reservoir	40,804	34	BRL(4), BWH(1), SWT(17),WSX(12) All 791 reservoirs in the region met the 95% compliance rule
Water sampled at consumers' taps				
<i>E.coli</i>	0/100ml	12,171	4	BWH(1) SWT(2), WSX(1)
Enterococci	0/100ml	1,392	0	
Notes: *The standard for <i>Cryptosporidium</i> ceased to exist when regulations changed from 22 December 2007 but the regulatory monitoring related to <i>Cryptosporidium</i> risk assessments continued until 1 October. **Turbidity is a critical control parameter for water treatment and disinfection. Summary details of all microbiological tests undertaken by each water company can be found on the DWI website or on the CD accompanying this report.				

E.coli at works

In 2008, a total of 23,089 tests at works were carried out by all the companies across the region and *E.coli* was detected in only one sample (1 BWH). On detecting *E.coli*, companies are required to act promptly to

protect public health. Their immediate response when finding *E.coli* at a works is to sample again, and more widely, to confirm that water being received by consumers is safe. In 2008, these additional tests gave satisfactory results in all cases.

Bournemouth and West Hampshire Water detected *E.coli* in a sample taken from Ampress works (near Lymington) in April 2008. The company checked the chlorine demand and turbidity data and found no unusual trends. The company attributed the failure to the sample tap which was replaced. There have been no subsequent *E.coli* failures at this site.

Table 5: Detection of *E.coli* and Enterococci at treatment works, service reservoirs and consumers' taps

Company	<i>E.coli</i> in water leaving treatment works	<i>E.coli</i> in water leaving service reservoirs	<i>E.coli</i> at consumers' taps	Enterococci at consumers' taps
Bournemouth and West Hampshire Water	1 – 1,465	0 – 1,046	1 – 1,158	0 – 108
Bristol Water	0 – 3,482	1 – 8,591	0 – 2,989	0 – 391
Cholderton and District Water	0 – 52	0 – 52	0 – 12	0 – 4
South West Water	0 – 7,370	4 – 15,057	2 – 4,179	0 – 276
SSE Water	0 – 0	0 – 0	0 – 4	0 – 1
Thames Water (Tidworth)	0 – 212	0 – 317	0 – 24	0 – 8
Wessex Water	0 – 10,508	4 – 15,742	1 – 3,805	0 – 604
Region overall	1 – 23,089	9 – 40,805	4 – 12,171	0 – 1,392
Note: Results are shown as the number of positive tests – the total number of tests.				

Coliform bacteria at works

Testing for coliform bacteria gives reassurance that water entering the supply was treated adequately to remove bacterial and viral pathogens. Repeated occurrences of coliform bacteria in samples from the same works in one year are thus of concern and require action to be taken. In 2008, this situation occurred once at Littlehempston works (SWT).

There were fewer failures in 2008 (10 compared to 16 in 2007) which occurred at works operated by four companies (1 BRL, 2 BWH, 3 SWT, 4 WSX).

In May and August 2008, South West Water detected coliforms in samples taken from Littlehempston works (near Totnes). Failures in the previous year (May 2007) had been linked to a fault with the sample tap which could not be turned off. The company replaced the sampling facilities, so it is disappointing to note that further failures have occurred in 2008.

Checks by the company at the works have failed to identify any deficiency in water treatment. A failure at Crownhill works (near Plymouth) in August 2008, which followed failures in previous years, has prompted South West Water to review the adequacy of the treatment processes in relation to the raw water quality. This repetition of failures will be taken into account during the Inspectorate's risk-based programme of technical audit.

Bristol Water detected a coliform in a sample taken from Cheddar Treated works (near Weston-Super-Mare) in September 2008.

An extensive sampling response and checks of treatment did not reveal any wider problem at the time, and subsequent samples have given satisfactory results.

Bournemouth and West Hampshire Water reported two coliform failures, one at Ampress works (see *E.coli* section) and another at Alderney works (near Poole) in August 2008. The company checked the works performance and found no abnormality at the time. Results for the rest of the year have been satisfactory.

A sample taken by Wessex Water in January 2008 from Dewlish works (near Dorchester) contained coliform bacteria and the company concluded this may have arisen as a consequence of contractors working on site and compromising the sample tap hygiene. The tap was replaced by the company as a precaution. Tap hygiene was also considered the most probable cause of a coliform failure which occurred at the company's Sturminster Marshall/Shapwick works (near Poole) in October 2008 where an air vent was blocked off. The lack of adequate protection of sampling facilities was a recurring theme in 2008 for Wessex Water. A coliform positive sample from Broadwood works (near Minehead) was associated in time with a detection of *Clostridium perfringens* in disinfected water. It was raining at the time of sampling and the sample point is located by large trees. The company has made a commitment to install a sampling kiosk to provide shelter and maintain hygienic conditions.

The Inspectorate has noted that coliform bacteria were found in 10 samples from treatment works in the Western region during the year and this information will be taken into account during the Inspectorate's risk-based programme of technical audit.

***Cryptosporidium* at works**

The regulations relating to *Cryptosporidium* monitoring of treated water changed with effect from 1 October 2008 when *Cryptosporidium* specific risk assessments and associated monitoring were replaced by comprehensive, multi-hazard, risk assessments for each treatment works and associated supply system. Under the new regime, raw water monitoring becomes a regulatory requirement.

In 2008, monitoring under the old regulations was required to be undertaken at 31 works (4 BRL, 4 BWH, 13 SWT, 10 WSX). All results met the former treatment standard of <1 oocyst per 10 litres and there were no reports of mains water supply-related outbreaks of cryptosporidiosis in the region during 2008.

Clostridium perfringens

This organism is a spore-forming bacterium that is exceptionally resistant to unfavourable conditions in the water environment, such as extremes of temperature and pH, and disinfection processes such as chlorination and ultraviolet light. It is a normal component of the intestinal flora of up to 35% of humans and other warm-blooded animals. These characteristics make it a useful indicator of either intermittent or historical faecal contamination of a groundwater source or surface water filtration plant performance. The detection of any *Clostridium perfringens* in the supply should trigger an investigation by the water company. In 2008, out of 5,406 samples taken in the region, seven contained *Clostridium perfringens* (3 BWH, 3 SWT, 1 WSX).

Three samples in 2008 collected by Bournemouth and West Hampshire Water from consumers' taps contained *Clostridium perfringens* (Knapp Mill North zone in March, Alderney South zone in November and Knapp Mill East zone in December). Further samples were satisfactory, suggesting these were all due to a localised disturbance of historic mains deposits. The Inspectorate has issued guidance to companies, which indicates that testing for this organism is only meaningful when it is carried out at supply points.

South West Water detected *Clostridium perfringens* on two consecutive days at Restormel works (near Bodmin) in March 2008 at a time when a clarifier had been returned to service after cleaning. A slight rise in turbidity in water coming off the filters was also noted. There have been no subsequent *Clostridium perfringens* failures at this site. There were no relevant observations made by South West Water in connection with another one-off detection of *Clostridium perfringens* in March 2008 at College works (near Penryn).

Clostridium perfringens occurred in a sample collected in January 2008, by Wessex Water from a free (concessionary) supply at a property in the Taunton area. The owner has refused a connection to the mains supply despite the fact that Wessex Water has explained the risks associated with this supply of raw water where the only safeguard is a point of use treatment device.

Turbidity at works

Turbidity is a measure of how much light can pass through water and indicates the condition or 'cloudiness' of water. Turbidity is caused by particles suspended in the water and is an important critical control measure of the performance of disinfection. Turbidity is measured at two points in the water supply chain, at treatment works where a value of 1NTU applies and at consumers' taps where the standard of 4NTU applies. The following discussion focuses on the results of samples taken at treatment works. For information on tests taken at consumers' taps, see the heading *Turbidity* in the section titled *Chemical quality*.

There has been no change in turbidity performance in the Western region between 2007 and 2008 with 16 samples >1NTU in 2007 compared to 17 in 2008 (2 BRL, 3 BWH, 2 SWT, 2 TMS, 8 WSX).

Turbidity results >1NTU were reported from Purton works (near Gloucester) in April and June 2008. There was an increase in turbidity associated with one of the rapid gravity filters on the day of the sample in April and the failure in June was associated with a notified water quality incident (see *Annex 3*). Bristol Water has identified the need to address a problem of sediment being stirred up when the high-lift pumps start up. The company cleaned one of the pump sumps in February 2009, the other will be cleaned in the autumn when demand reduces allowing the work to take place.

Bournemouth and West Hampshire Water reported elevated turbidity in two samples from Woodgreen works (near Southampton) in June and October 2008. This groundwater source is iron rich and precipitation in the sample line is the probable cause. The Inspectorate has recommended improvements to the sampling arrangements at the site.

Two unsatisfactory turbidity results were reported in samples from Tidworth Chalkpit managed by Thames Water. In both March and May 2008 a rise in turbidity was associated with heavy rain and the situation in May was notified to the Inspectorate as a water quality event (see *Annex 3*).

South West Water reported two elevated turbidity results in 2008. In March, the problem at Greatwell works (near Honiton) was due to rust in the sample line which has since been replaced. At Houndall works (near

Plymouth) in October, the sample had been taken immediately after the works started up and lime deposits were disturbed. The company has replaced the turbidity meter with a submerged unit and improved the lime dosing pumps. The site has been out of supply since the failure and a return to service date has not yet been agreed. There was also a notified incident at this works (see *Annex 3*).

On eight occasions in 2008 Wessex Water reported turbidity values >1NTU compared to nine in 2007. Each was an isolated occurrence, but the cause of these results was common, namely the samples were not representative of water in supply due to problems such as the start up of borehole pumps, or the introduction of a new borehole. It is a regulatory duty of companies to ensure that samples are representative and the Inspectorate is very disappointed to note the lack of attention being paid to such problems.

***E.coli* at service reservoirs**

In 2008, across the region, a total of 40,805 tests were carried out at service reservoirs by all the companies. *E.coli* was found in nine samples taken at service reservoirs in 2008 (1 BRL, 4 SWT, 4 WSX) which represents a deterioration in performance compared to the two failures in 2007. However, three of the positive samples were linked to a single notified water quality incident at the Chard reservoir in October 2008 operated by Wessex Water (see *Annex 3*).

E.coli was detected on a single occasion during the year from nine service reservoir locations: Snowdon No. 1 and No. 2; Chard, and Croydon Hall operated by Wessex Water; Pill-1b-Ot South belonging to Bristol Water; Bolventor, Antony reservoir 3, Upton and Moorhaven reservoir owned by South West Water. On detecting *E.coli*, companies are required to act promptly to protect public health. The immediate response when finding *E.coli* at a service reservoir is to sample again, and more widely, to confirm that water being received by consumers is safe. In 2008, these additional tests all gave satisfactory results and there were no subsequent *E.coli* failures.

Wessex Water detected *E.coli* in three samples from related service reservoirs on the same day in October 2008. The problem at Snowdon (No. 1 No. 2), near Chard and Chard reservoirs is thought to have arisen due to a contractor removing a sealant from around the telemetry ducts at Chard reservoir just prior to heavy rain, which caused surface water draining off fields to flood the roof. All the reservoirs were manually dosed with chlorine, flushed out and returned to supply and consumers were advised to boil their water in the interim period. This was reported to the Inspectorate as a water quality incident (see *Annex 3*).

The Inspectorate is critical of companies adding chlorine to reservoirs

before re-sampling, because such action hampers the investigation into the cause and extent of the contamination by masking the isolation of indicator bacteria in subsequent samples.

Wessex Water also detected *E.coli* in a sample from Croydon Hall reservoir (near Minehead) in September 2008. Swab analysis confirmed that the sampling tap was contaminated. Conditions in the sampling kiosk were unacceptable, it was flooded and surface water was not draining away. There have been no subsequent *E.coli* failures at this site following cleaning of the sampling tap and kiosk.

A sample taken by South West Water from Antony reservoir 3 (near Plymouth) in August failed for *E.coli*. The reservoir was drained down and inspected and nothing untoward found. No further failures have been reported from this site since. The investigation of another failure by South West Water did find a number of issues requiring remedial action at Bolventor reservoir near Bodmin in August. Work to install an external roof membrane and repair vents along with maintenance of the chlorine boosting equipment was completed in October 2008.

When *E.coli* was reported in a sample taken by South West Water at Moorhaven reservoir (near Ivybridge) in August 2008 the Inspectorate became aware that the company was not sampling from the reservoir, but collecting samples from a consumer's tap at the first property on the downstream supply main. The company was doing this because it knew the sampling arrangements at the reservoir were unsuitable, but had not taken action to rectify the matter. The company installed a new sampling point at the reservoir, which became operational in February.

Another example of samples unrepresentative of the water in supply being reported by South West Water occurred in respect of *E.coli* in a sample from Upton reservoir (near Kingsbridge) in August 2008. This was attributed to unsuitable conditions in the sample kiosk which was cleaned. Elevated colony counts provided corroborating evidence of issues with the pumped sample lines.

A sample taken by Bristol Water from Pill-1b-Ot South reservoir in October 2008 contained *E.coli*. The company's investigation found no abnormal colony count trends and a recent internal inspection of the reservoir had shown no ingress points (May 2008). The company's risk based approach using weekly reviews of colony counts did not identify an increased risk of future failure at this reservoir. All subsequent samples have been satisfactory.

Coliform bacteria at service reservoirs

Testing for coliform bacteria gives reassurance that the quality of water held at these strategic points in the distribution system is adequately maintained. The national standard requires that at least 95% of no less than 50 samples collected from each service reservoir throughout one year are free from all coliform bacteria. In 2008, all 791 service reservoirs (including water towers) in the region met the standard. Antony reservoir 3 (near Plymouth) owned by South West Water was the only one in the Western region to exhibit multiple failures in 2008 (see *E.coli* section).

At Westcombe-1b-Ot West reservoir (near Bath), follow-up samples to a failure in September also contained coliforms. The reservoir compartment was taken out of service and inspected, whereupon it was found that the sampling kiosk leaked into the reservoir. Remedial work was carried out by Bristol Water and a drainage channel has been dug around the sampling kiosk. There have been no further failures at this site.

Following a coliform detection at Trevelyan reservoir (near Penzance) in April 2008, South West Water's inspection found no integrity issues. However, the Inspectorate noted that the company dosed the reservoir with chlorine before taking investigative samples. The Inspectorate is critical of companies adding chlorine to reservoirs before re-sampling, because such action hampers the investigation into the cause and extent of the contamination by masking the isolation of indicator bacteria in subsequent samples.

South West Water drained and inspected a reservoir at Houndall (near Plymouth) after detecting coliforms in a sample in October 2008. The investigation revealed defects and carried out repairs to roof hatch gauze and seals in April 2008. Work to relocate a combined outlet sample point is currently in progress, due to be completed by June 2009.

At Hazeldown reservoir (near Newton Abbot), South West Water found severe leaks following an internal inspection after coliforms were detected in a sample in October 2008. Although all further samples have given satisfactory results, the Inspectorate is critical of the company because repairs were delayed and finally completed in March 2009.

South West Water identified and rectified a variety of other defects at service reservoirs in 2008 following reported coliforms failures: at Beacon Hill a point of ingress for insects was found, at St Pinnock reservoir (near Liskeard) external repairs were made and an inspection scheduled for 2009 and a leaky roof was found after an internal inspection at Rousdon reservoir (near Lyme Regis). In the latter case the company has included work to replace the roof membrane in its business plan (PR09).

A sample taken from Park Hill reservoir (near Bath) owned by Wessex Water, failed for coliforms in September and this led the company to

identify an issue with poor turnover leading to low chlorine residuals. At Polden Old reservoir (near Bridgwater), Wessex Water identified iron corrosion and defective booster chlorine equipment. Additionally, in response to coliform failures, Wessex Water replaced a sampling tap at (Lydeard St Lawrence reservoir, near Taunton), replaced a sampling kiosk and increased turnover at Moorbrake Camp reservoir (near Minehead) and plan to isolate and inspect a reservoir at Hooke (near Bridport).

The Inspectorate has noted that coliform bacteria were found in 34 samples from service reservoirs in the Western region during the year and this information will be taken into account during the Inspectorate's risk-based programme of technical audit.

***E.coli* and Enterococci at consumers' taps**

A total of 12,171 consumers' taps were tested in 2008 for *E.coli* and just four were positive (1 BWH, 2 SWT, 1 WSX). There was no indication, from information gathered by the three water companies, of a faecal contamination event affecting other properties in these zones. Like *E.coli*, the presence of Enterococci is indicative of faecal contamination and neither bacterium should be found in any sample. In 2008, the companies carried out 1,392 tests for Enterococci at consumers' taps and none were positive.

A sample from a consumer's tap in the Penzance and St Ives zone in January 2008 contained *E.coli*. A sampling survey from upstream and downstream properties and a service reservoir gave satisfactory results, and there have been no other failures in this South West Water zone in 2008. The company investigated a second failure in a consumer's tap sample from Torquay zone in July 2008 and concluded the cause was the mixer tap. After removing, cleaning and replacing the tap insert the company took further samples which gave satisfactory results.

Tests by Wessex Water on a consumer's tap before it was cleaned, verified that an *E.coli* failure which occurred in Allington zone in March was due to poor tap hygiene.

Bournemouth and West Hampshire Water found *E.coli* in just one consumer's tap sample from Alderney South zone in July 2008. The checks by the company were unable to identify a cause. All further samples have proved satisfactory.

Chemical quality

The drinking water regulations set out the minimum testing requirements for all chemical and physical parameters. A full summary of the results of

testing by each company, including the results for indicator parameters is provided on the DWI website and on the CD accompanying this report.

The following text and Table 6 set out the results for those parameters where there has been a failure to meet a European or national standard (mandatory quality standards) and any other parameter of interest.

In addition, at the request of local authorities, the results of testing for fluoride, iron, lead, manganese, nitrate, nitrite and pesticides are given.

Table 6: Chemical and physical parameters

Parameter	Current standard or specified concentration	Total number of tests	Number of tests not meeting the standard	Additional information
Aesthetic parameters				
– colour	20mg/l Pt/Co scale	4,450	0	
– odour	No abnormal change	3,358	5	BRL (3), SWT (1), WSX (1)
– taste		3,291	6	BRL (1), BWH (1), SWT (2), WSX (2)
Aluminium	200µg/l	3,957	1	BRL (1)
Benzo(a)pyrene	0.01µg/l	1,368	1	BWH (1)
Copper	2mg/l	1,773	1	WSX (1)
Fluoride	1.5mg/l	1,221	0	
Iron	200µg/l	3,967	13	BRL (6), SWT (4), WSX (3)
Lead (current standard)	25µg/l	1,396	1	WSX (1)
Lead (future standard)	10µg/l	1,396	17	BRL (8), SWT (2), WSX (7)
Manganese	50µg/l	3,964	0	
Nickel	20µg/l	1,393	3	BRL (1), BWH (1), WSX (1)
Nitrate	50mg/l	1,795	0	
Nitrite	0.5mg/l	1,791	0	
Pesticides – total	0.5µg/l	1,460	1	BWH (1)
Pesticide – individual (see note 3)	0.1µg/l	40,753	9	2,4,-Db BWH (1) Metaldehyde BRL (8)
Turbidity (at consumers' taps)	4NTU	4,778	1	BRL (1)
Notes:				
1. For summary details of all tests undertaken by each water company refer to the DWI website or the CD accompanying this report.				
2. For comparison, 1mg/l is one part in a million, 1µg/l is one part in a thousand million.				
3. A further 4,808 tests were done for aldrin, dieldrin, heptachlor, heptachlor epoxide, all of which met the relevant standard.				

Aesthetic parameters

Consumers expect their drinking water to be clear and bright in appearance and free from discernible taste or odour. In recognition of this the regulations stipulate national standards for colour, odour and taste. From the start of this year companies have been required to report all positive detections of a taste and odour because the national standard was brought into line with the EU Drinking Water Directive with effect from

22 December 2007. Previously companies only reported on samples where a taste or odour was detected at a level of three dilutions or stronger.

In 2008, a total of 11 samples from consumers' taps in the Western region exhibited a positive taste or odour. All 4,450 tests in the region met the standard for colour.

The positive detections of taste and odour are summarised below in relation to their nature and cause as determined by the investigations carried out by the companies. From this information it can be seen that many were confined to pipes or fittings in a single property. In other instances there was a problem with the way the water company followed the analytical method. The Inspectorate has issued guidance to companies to prevent these problems from arising in future years.

- Earthy/Musty: 4 (4 BRL): In August 2008, four samples from two zones (Filton and Northville; Yate Coalpit Heath and Warmley) exhibited an earthy taste/odour due to the presence of natural compounds, geosmin and MIB (methylisoborneol). Bristol Water identified the cause as British Water Ways cutting vegetation in the Gloucester-Sharpness canal supplying Purton and Littleton works (BRL). This was notified to the Inspectorate as a water quality incident (see *Annex 3*).
- TCP: 3 (3 WSX): Wessex Water reported a 'disinfection byproduct' taste/odour in three samples in 2008. In the Lulworth zone in August this was due to the formation of trihalomethanes due to low turnover in a service reservoir. In the Allington zone in September the problem was confined to a single property and probably related to a reaction between residual chlorine and an unsuitable material in a water fitting or kettle.
- Other: 4 (1 BWH, 3 SWT): Two companies in the region reported a taste/odour in four samples in 2008, but the laboratory failed to provide a descriptor. The Inspectorate has issued guidance to companies (Information Letter IL/05/2009) to ensure these method errors do not occur again. One of these samples was from a consumer's tap in the Falmouth and Redruth zone where South West Water has a legally binding programme of work to address earthy tastes and odours due to algal breakdown products in the raw water at Stithians and Tamar works. This work was completed in July 2008.

During 2008, Bristol Water commissioned additional treatment at Cheddar works and Banwell works to address problems of taste and odour and this will benefit more than 270,000 consumers. South West Water also completed improvement work at two works (Stithians and Tamar) involving reservoir management and additional filters to improve the taste and odour

of water supplies to about 300,000 consumers. At Maundown works, improvements relating to taste and odour by Wessex Water in 2009 will benefit about 200,000 consumers.

Aluminium

Aluminium can occur naturally in some drinking water sources. Also, aluminium-based water treatment chemicals may be used at surface water works to aid the process of filtration.

In 2008, a total of 3,957 samples were tested for aluminium in the Western region. Bournemouth and West Hampshire Water, Cholderton and District Water, South West Water, SSE Water and Wessex Water achieved 100% compliance with the aluminium standard. Just one test exceeded the standard (1 BRL).

A sample taken by Bristol Water from Thornbury and Olveston zone in August failed the aluminium standard. Follow-up samples contained only low levels ($<11\mu\text{g/l}$). The failure was associated in time with a disturbance of mains deposits caused by the laying on of a new supply to a nearby housing development.

Arsenic

Arsenic only occurs in drinking water where natural minerals containing arsenic are present in the local bedrock. In England this is not a frequent occurrence. Where companies have identified a potential risk, either water treatment or blending arrangements to reduce arsenic have been installed.

In 2008, a total of 1,559 tests were carried out for arsenic across the region and all met the standard ($10\mu\text{g/l}$), which is the same as the new tighter World Health Organisation's (WHO) provisional guideline set because of health concerns arising from much higher exposures (greater than $50\mu\text{g/l}$) in other parts of the world.

In 2008, Bristol Water completed two programmes of work at Cheddar works and Rowberry/Banwell works to secure compliance with the standards for arsenic, manganese and taste and odour. Over 276,000 consumers are benefiting from improved water quality in this area.

Copper

Copper in drinking water usually derives from copper pipes and fittings in household plumbing. In general, water supplies in the UK are not aggressive towards copper, but there can be occasional problems with new

plumbing installations. In 2008, a total of 1,773 tests were carried out for copper across the region and all but one met the standard (2mg/l).

In August 2008, a level of 2.32mg/l copper was reported in a sample from a consumer's tap in the Fovant 2 zone. Wessex Water found that the service pipe was made from plastic, but the internal plumbing was copper. Advice was given to the householder about flushing the tap prior to drawing water for drinking and cooking.

Fluoride

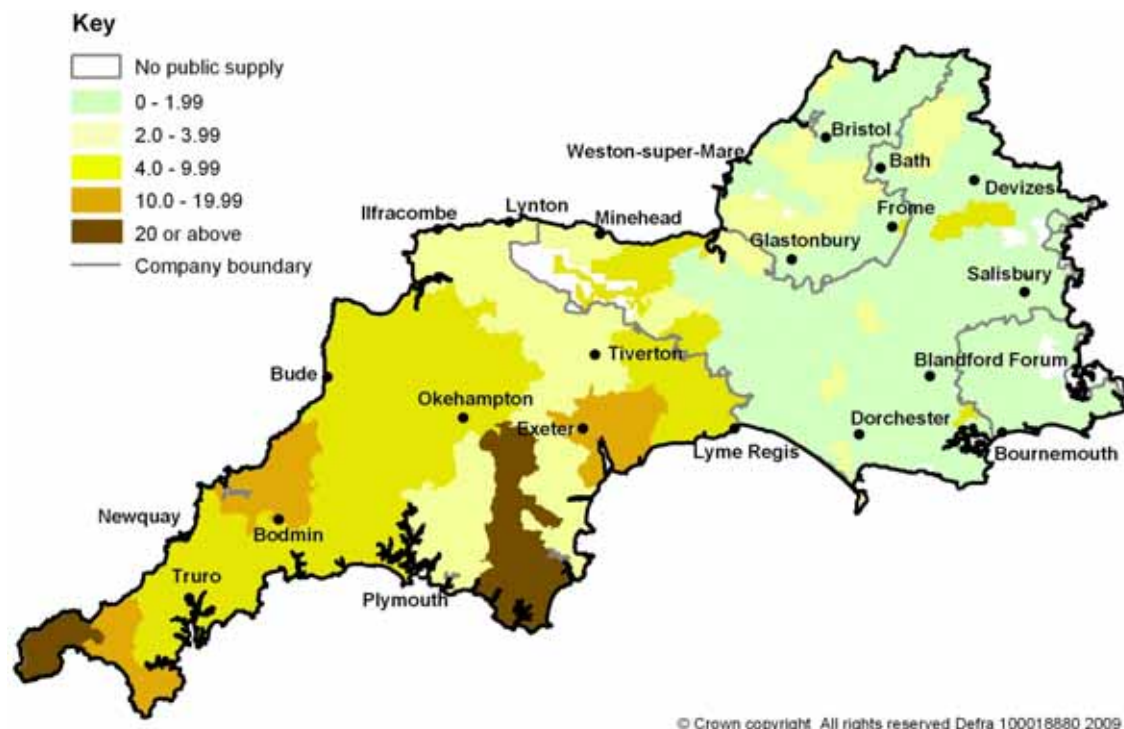
Traces of fluoride occur naturally in many water sources, particularly in groundwaters. For example, fluoride occurs in water drawn from the great Oolite limestone in the area of North East Somerset and West Wiltshire (particularly around Lacock). Consumers can obtain specific information on the level of fluoride in the drinking water supply to their home or workplace from their water company.

Fluoride is not removed by conventional water treatment. Some companies fluoridate water supplies at the request of the local health authority as a protection against tooth decay. There are no fluoridation schemes in the Western region. In 2008, all 1,221 tests for fluoride taken across the region met the regulatory standard (1.5mg/l). See the DWI website <http://www.dwi.gov.uk> for more information on fluoridation.

Iron

Iron may be present naturally in raw water, iron compounds may be added as part of water treatment or it can be released as a consequence of the corrosion of iron mains. Effective water treatment prevents these problems arising at source. Nowadays, most samples failing the standard for iron are from places where the distribution network contains a large proportion of old cast iron pipes. When deposits in these pipes are disturbed by an operational problem (such as a burst main), they turn the water orange-brown. Elevated levels of iron are objectionable to consumers because the water may appear turbid, it may have an astringent or bitter taste and the deposits are unsightly and may stain water fittings. Discolouration of water supplies often prompts consumers to contact their water company. The rate of contact for each supply zone is mapped below in Figure 7.

Figure 7: Consumer contact rates per 1,000 population for black, brown or orange water



Four companies have completed their section 19 programmes of work to improve the condition of their distribution systems for water quality purposes. South West Water has a large continuing programme, and made satisfactory progress against targets in 2008.

There was a good improvement in the region's compliance with the iron parameter reported in 2008, with the number of failures down to 13 compared to 22 in 2007. This reflects the investment in network maintenance by the companies over the past decade, the benefits of which are also verified by a reduction in the number of consumers experiencing dirty water (see *Discoloured water* section).

Table 8: Progress with improvement programmes on distribution systems

Company	Length of main renovated in 2008	Length of main still to be renovated	Renovation completed	Completion due
Bournemouth and West Hampshire Water	None	None	Dec 1998	N/A
Bristol Water	None	None	Dec 2003	N/A
Cholderton and District Water	None	None	N/A	N/A
South West Water	369.2km	401.0km	N/A	Dec 2009
Wessex Water	None	None	March 2006	N/A
Region overall	369.2km	401.0km		

In 2008, Wessex Water reported three failures of the iron standard and each one was considered to be an isolated event caused by a localised disturbance of the main dealt with by flushing of the main at the time and not indicative of a wider problem. Two of these failures occurred in the same zone (Maundown Central) in June and August. The Inspectorate expects the company to use this information to inform its Distribution, Operation and Maintenance Strategies.

Bristol Water reported six iron failures in 2008, again each was considered to be an isolated event caused by localised disturbance of mains deposits. One zone (Weston-Super-Mare Central) exhibited two failures in July and October. The company has a legally binding agreement to renovate or clean mains in all five of these zones by March 2010.

Three of the four iron failures reported in 2008 by South West Water occurred in the Penzance and St Ives zone, South Hams zone and the Camborne and Lizard zone, where the company has a legally binding agreement to renovate or clean water mains.

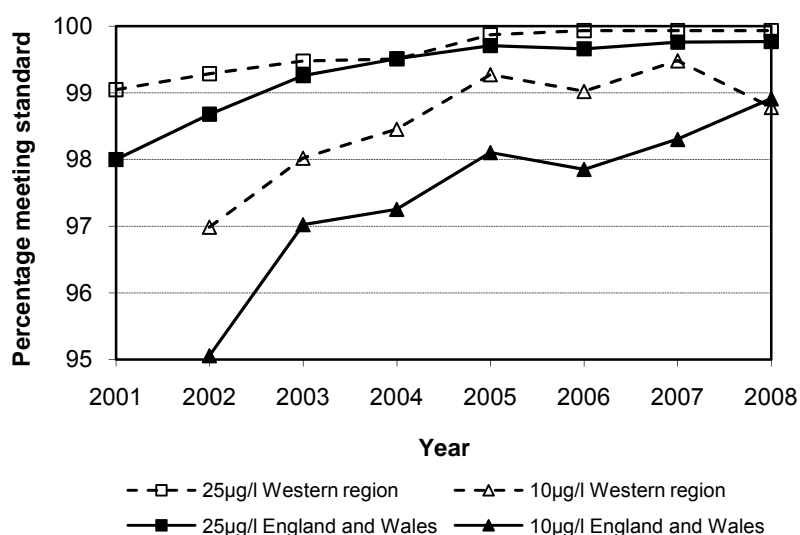
Lead

The pipe connecting a property to the water company main, together with internal plumbing, is the most common source of lead in drinking water. Properties built or renovated since 1970 are unlikely to have lead pipes and lead solder was banned for use with copper drinking water installations in the early 1970's. The only other recognised source of lead in drinking water in some buildings is fittings made from brass. The extent of lead pick up depends on various factors; temperature, acidity (pH),

water hardness, the length of pipe and the time that water is left to stand in the pipe (stagnation) before it is drawn off.

The Inspectorate has added the monitoring data collected by companies during 2008 to that gathered in previous years, providing an updated picture of progress in the region and for the industry, towards meeting the future standard for lead of 10µg/l by the end of 2013. Figure 9 shows that progress towards meeting the future standard in the Western region is close to the industry average. The pattern of results for 2008 has reinforced the need for further action to be focused on the regions cities, such as Bath and Bristol. The Inspectorate has updated its guidance to companies on the regulations for lead.

Figure 9: Progress towards meeting the current and future standard for lead between 2001 and 2008



Water companies notify both the consumer and the relevant local authority whenever a failure of the lead standard occurs. In 2008, the Inspectorate was notified of one failure in the region (1 WSX). A sample from a consumer’s tap in the Porlock zone in February 2008 exhibited a value of 38µg/l. Wessex Water wrote to the customer who gave permission for the company to replace the service pipe at the same time as the company’s pipe. This was completed in May 2008.

Companies have put forward proposals in their final business plans (PR09) for an integrated package of measures to address the risk to consumers of exposure to lead from lead pipes. The measures include targeted lead communication pipe replacement in high risk areas, working with Health Protection teams and Primary Care Trusts to address risk to vulnerable consumers, educating consumers on the benefits of lead pipe replacement

as part of pre-planned work on the distribution system and lead communication pipe replacement on failure of 10µg/l.

In addition, during 2008, companies in the region have responded to 511 consumer requests to check the level of lead in drinking water in their properties.

Manganese

Manganese occurs naturally in many sources of water. It can be removed from raw water by converting the soluble form to an insoluble precipitate (oxidation). Treatment can be simple to achieve (aeration), but for some waters more complex processes are needed. If effective treatment is not in place then black deposits may collect in the distribution pipes.

When disturbed, such deposits may turn the water black. Even small traces of manganese are objectionable to consumers. Typical complaints relate to the staining of laundry or the discolouration of vegetables during washing or cooking. The purpose of the standard for manganese is to minimise these problems. In 2008, all of the 3,964 tests across the region met the standard (50µg/l). This is an improvement over previous years (four failures in 2007).

In 2008, Bristol Water completed legally binding programmes of work to install additional treatment which will reduce naturally occurring manganese in the source water at Cheddar works and Banwell works. A further two schemes, to address historic deposits in water mains by a trunk mains cleaning programme and by installing washouts and a mains flushing programme across the region, are due for completion in 2010.

South West Water has six legally binding programmes of work which will address manganese in source water at the following works: Stithians, Tamar, Avon, Lower Moor, Tottiford, Venford. These are due for completion between 2009 and 2011. When completed, over one million consumers will benefit from improved water quality.

Nickel

Nickel may be present in coatings on modern tap fittings. In 2008, a total of 1,393 tests were carried out for nickel and all but three met the standard of 20µg/l (1 BRL, 1 BWH, 1 WSX).

An unusually high level of nickel (193µg/l) was reported in a sample from a consumer's tap in the Porlock-Domestic zone in April 2008. Wessex Water found that the tap at the premises was chrome plated and made arrangements for it to be replaced. All further samples were satisfactory.

A failure at a consumer's tap in October 2008 from Clevedon zone was verified by Bristol Water as being due to a chrome plated tap when first draw samples gave higher levels of nickel than flushed samples. Advice was given to the householder.

A nickel level of 113µg/l was reported in a sample from a customer's tap in the Knapp Mill East zone in December 2008. Bournemouth and West Hampshire Water's sampling at neighbouring properties was satisfactory and the company attributed the failure to a chrome tap.

Nitrate and nitrite

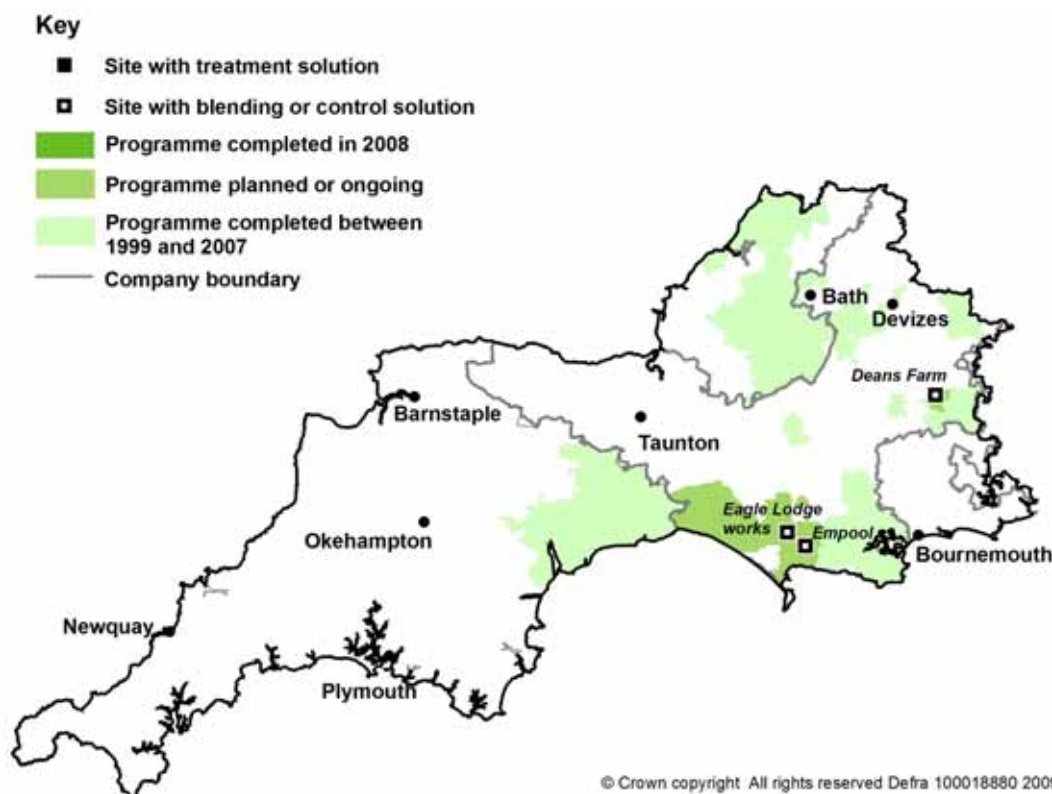
Nitrate occurs naturally in all source waters due to the decay of vegetable material in soil. Nitrogenous fertilisers used on arable farmland are a significant source of nitrate in groundwater. Rainfall washes nitrate from the soil in to lakes, rivers and streams. Nitrate levels can be reduced by water treatment or by blending with another, low nitrate, water source. In 2008, all 1,795 tests for nitrate across the Western region met the standard (50mg/l).

From extensive information gathered by the water companies, a likelihood of drinking water supplies in the region failing the nitrate standard in the longer term has been confirmed at some sites. As a consequence, legally binding agreements are in place for additional treatment if required. Wessex Water are carrying out catchment management work in respect of four works (Empool, Deans Farm, Eagle Lodge and Winterbourne Abbas) with an option for additional treatment if required. This will be completed by 2011 benefiting more than 167,000 consumers.

Nitrite may be formed when chloramine is used as the residual disinfectant to maintain the microbiological quality in the distribution network. The formation of nitrite is controlled by careful optimisation of the disinfection process. Bournemouth and West Hampshire Water practices chloramination in all of its supplies. Nitrite can also form in samples of water, after collection and before analysis, especially if the sample is not kept cool.

In 2008, all 1,791 tests carried out across the region for nitrite met the standard (0.5mg/l).

Figure 10: Extent of nitrate improvement programmes



Pesticides and related products

This group of substances, generically called pesticides, includes many organic chemicals ranging from weed killers, to insecticides and fungicides. Water sources may contain traces of pesticide residues as a result of agricultural use (pest control on crops) and non-agricultural uses (herbicides for weed control on highways etc.). Water companies are required to assess the risk to drinking water supplies of pesticide use in their catchments and test for those which might be present.

Companies have documented potential and actual pesticide hazards through their Regulation 27 risk assessments which are informed by raw water monitoring and identify the control measures in place.

When pesticides are first detected, water companies will enhance their monitoring of raw water and notify the Environment Agency to facilitate appropriate action to safeguard drinking water quality.

In 2008, one (BWH) of the tests in the region exceeded the standard for total pesticides. There was 100% compliance (4,808 tests) for the four pesticides with a standard of 0.03µg/l. Out of a total of 40,753 tests for those individual pesticides (with a standard of 0.1µg/l) nine (8 BRL, 1 BWH) exceeded the standard. The circumstances and substances involved are summarised below.

Following detections of chlortoluron and atrazine pesticides at Friar Waddon in 2004, Wessex Water entered into a legally binding programme of catchment management involving a 'no spray' agreement with the local farmer. This work is now complete and monitoring in the zones supplied by this works has given satisfactory results in 2008.

2,4-D

2,4-D is a phenoxy acid herbicide used for killing broad-leaved weeds in cereal crops, turf, forestry, orchards and non-crop areas. The standard is 0.1µg/l.

In March, 2,4-D was detected at a level of 1.9µg/l in a consumer's tap sample collected from Wimborne zone. Bournemouth and West Hampshire Water's investigation established that this was not representative of water entering supply, instead it was due to the use of a contaminated sample container. This poor analytical practice is discussed in more detail in the *Incidents in 2008* section of the report.

Metaldehyde

During 2008, metaldehyde, the active ingredient of some slug pellets, was identified by Bristol Water as a new pesticide hazard in the source water used at several of its works (Littleton, Purton, Stowey, Rowberrow and Banwell). The levels found ranged from 0.126µg/l to 0.348µg/l. The Health Protection Agency has advised that no adverse health effects are expected from these levels in drinking water. The company notified this hazard to the Inspectorate as a water quality event (see *Annex 3*). The Inspectorate has required the company to ensure that treatment is optimised at all times, for example, by timely regeneration of granular activated carbon filters and to develop catchment management controls to minimise the occurrence of this pesticide in its raw water sources.

Polycyclic aromatic hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) are present in coal tar. Before 1970, coal tar was widely used to line iron pipes. Therefore PAHs, including benzo(a)pyrene, may be present in the water as a result of the degradation of these linings. In 2008, throughout the region, none of the 1,368 tests failed the standard for PAH (0.1µg/l) and only one out of 1,368 tests exceeded the benzo(a)pyrene standard of 0.01µg/l (BWH).

In the Knapp Mill East zone, a sample collected from a consumer's tap in December 2008 exhibited a value of 0.0141µg/l. A sample from a

neighbouring property also failed the benzo(a)pyrene standard. Bournemouth and West Hampshire Water flushed the local mains and there have been no subsequent failures. The Inspectorate expects companies to use such information to inform their Distribution, Operation and Maintenance Strategies.

Turbidity

Turbidity is the cloudiness of water as determined by measuring the degree of scattering of a beam of light as it passes through the water. Turbidity may be measured by on-line instruments, usually located at a water treatment works, in addition to tests carried out on samples sent to a laboratory. The national turbidity standard for water at consumers' taps is 4NTU. Failures of this standard are usually associated with the disturbance of sediment within water mains.

Additionally, and importantly, water companies must measure turbidity at the water treatment works. Treated water entering the distribution system must not exceed the regulatory turbidity specification of 1NTU.

The following discussion focuses on the results of samples taken from consumers' taps. For information on tests taken at water treatment works, see the heading *Turbidity* in the section titled *Microbiological quality*.

In 2008, a total of 4,778 samples from consumers' taps across the region were tested for turbidity and all but one (BRL) met the standard of 4NTU.

A result of 15.4NTU was reported in a consumer's tap sample from the Long Ashton Failand and Abbots Leigh zone. The investigation by Bristol Water found elevated turbidity in other samples and the company has since replaced the communication pipe serving the property and intends to reline the local trunk main to prevent any recurrence.

Consumer perceptions of drinking water quality

When consumers have a question or a concern about drinking water quality their first point of contact is the water company. All companies record these contacts using definitions agreed with the Inspectorate. Table 11 shows the change in the rate of consumer contacts per 1,000 population for the three main categories (appearance, taste and odour, and illness) since 2006.

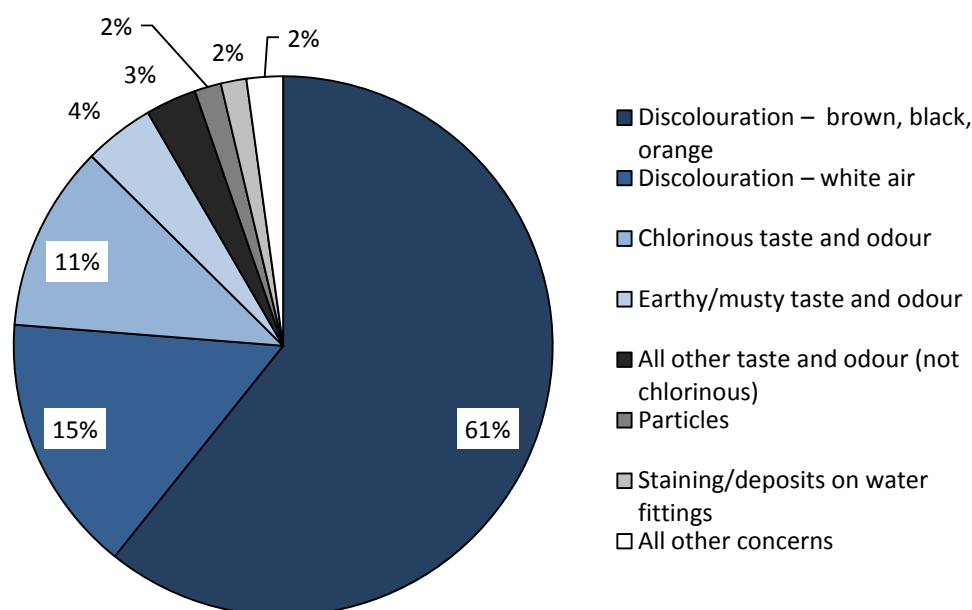
Table 11: Total contact rates of appearance, taste and odour, and illness

Company	Contacts per 1,000 population		
	2006	2007	2008
Bristol Water	3	3	4
Bournemouth and West Hampshire Water	1	1	1
Cholderton Water	0	0	0
South West Water	16	14	12
SSE Water	<i>See note</i>	<i>See note</i>	0
Thames Water (Tidworth)	1	1	1
Wessex Water	3	3	3
Region overall	5	4	5

Note: SSE Water commenced supplying water in the region in 2008.

In the Western region, the most frequently reported consumer concerns during 2008 were discolouration – brown, black, orange (61%), discolouration – white due to air (15%), chlorinous taste and odour (11%) and earthy/musty taste and odour (4%). Together these constituted 91% of all consumer contacts about drinking water quality in 2008.

Figure 12: Consumer concerns in the Western region in 2008



Over the last three years there has been a 12% reduction in the total number of consumer contacts reporting a problem with their drinking water quality across the Western region. Further detail on these categories is provided below.

Discoloured water

Contacts due to brown, black or orange discolouration caused by deposits of iron, aluminium and manganese are fewer in number nationally, demonstrating the benefits of over a decade of investment in distribution renovation by the water companies. With discolouration being the main consumer concern in the Western region it is pleasing to note that over the period 2006 to 2008 the benefits of this investment has resulted in a 24% reduction in the number of discolouration reports by consumers. As shown in Table 13 below, customers of South West Water have experienced the greatest improvement in the acceptability of drinking water as demonstrated by a fall in contacts for brown, black or orange water from 19,000 in 2006 to 13,000 in 2008, a decrease of 30%. However, it is disappointing to note that in the same time period the situation has been less favourable for customers of Wessex Water, as illustrated by a 29% increase in 'dirty' water reports since 2006. The number of contacts about brown, black or orange water for each company are shown below.

Table 13: Consumer contacts for brown, black or orange water 2006-08

Company	Number of consumer contacts reporting brown black or orange water		
	2006	2007	2008
Bristol Water	1,599	1,890	1,622
Bournemouth and West Hampshire Water	229	98	102
Cholderton Water	0	0	0
South West Water	19,163	16,667	13,462
SSE Water	<i>see note</i>	<i>see note</i>	0
Thames Water (Tidworth)	1	2	0
Wessex Water	1,245	1,459	1,604
Total	22,237	20,116	16,790
Note : SSE Water commenced supplying water in the region in 2008.			

White or cloudy water caused by air was the second biggest cause for concern reported by consumers in the Western region and the Inspectorate is disappointed to note that companies have made no progress in remedying these problems which are usually due to the operation of valves or pumps – the figure remaining at around 4,000 contacts since 2006.

Chlorine taste and odour

Over the past three years the proportion of contacts attributable to chlorinous tastes and odours has risen across the industry from 8% to nearly 13% of all consumer concerns (from over 12,000 to nearly 18,000 contacts). The reasons for this trend are twofold: investment by the

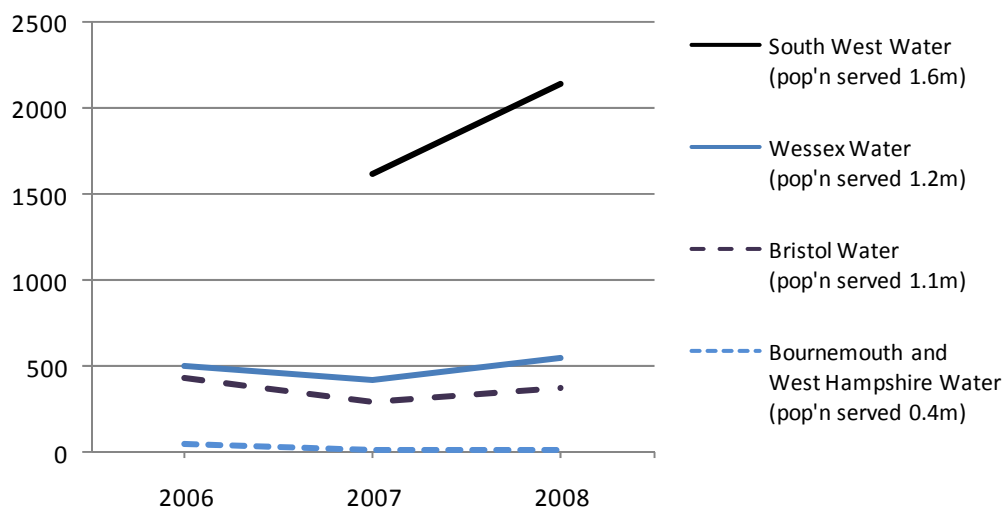
companies has been effectively tackling the causes of discolouration, therefore dirty water complaints are declining in number as water mains are renewed or renovated and water quality is improved at source through enhanced water treatment resulting in a more stable chlorine residual which is carried further through the network of pipes. These are the positive benefits of water company investment. However, it does mean that some consumers will be experiencing fresh tap water with a trace of chlorine for the first time.

In the Western region, 30% more consumers reported a chlorinous taste and odour in 2008 compared to 2007. This applies to all companies except Bournemouth and West Hampshire Water. The Inspectorate expects companies to develop and implement chlorine management strategies and this will be taken into account during the Inspectorate's forward programme of technical audit.

Figure 14: Consumer contacts for chlorinous taste and odour 2006-2008

Note: South West Water did not record contacts for chlorinous taste separately in 2006.

Cholderton Water, SSE Water are not included on the graph as they had no contacts. Thames Water (Tidworth) had one contact reporting a chlorinous taste and odour in 2008.



When the response of a company fails to provide the necessary reassurance or remedy, the consumer may turn to the Inspectorate for advice. As can be seen from Table 15, in 2008 there were eight consumers living in the region who complained directly to the Inspectorate; less than the 11 complaints received in 2007. Consumers who turn to the Inspectorate often display a lack of trust in their water company. The action taken by the Inspectorate involves obtaining information from the company and providing the consumer with an independent opinion on

the matter. Where necessary, the Inspectorate will recommend the company takes further action.

Table 15: Contacts from consumers received by the Drinking Water Inspectorate

Category	Number of contacts
Appearance	5
Taste and odour	3
Report of illness	0
Water quality concern	0
Number of contacts to DWI from consumers by company. BRL (1), BWH (1), SWT (6)	
Categories are as defined in Information Letter 1/2006.	

The following case highlights the intermittent nature of water quality problems relating to water fittings. Companies need to ensure that their complaints handling protocols recognise this and prioritise repeat contacts from a consumer.

In August, a customer of Bristol Water contacted the Inspectorate reporting that the tap water was undrinkable because of a strong medicinal (TCP) taste which was particularly notable in hot drinks. The company flushed the water main, inspected the plumbing and water fittings, conducted on-site taste and odour tests and collected samples for analysis. However, on the day of testing neither the sampler or the consumer discerned an abnormal taste. Subsequently the problem recurred causing the customer to contact the company again. On this occasion the company ruled out a problem in other taps (e.g. bathroom) and this helped to pinpoint the problem to the kitchen tap. The customer was given advice to change tap washers. The Inspectorate recommends that companies take a proactive approach to customer education by providing copies of the Water UK leaflet titled *Looking After Water in Home* whenever they visit a property to collect a sample.

Incidents in 2008

The companies in the Western region notified the Inspectorate of 62 events during 2008. The Inspectorate classified 19 as 'incidents' requiring a comprehensive report from the company and a full investigation by the Inspectorate, this compares to 10 in the region in 2007.

Table 16: Water quality events in the region in 2008

Water company	Number of events notified	Number classed as incidents
Bournemouth and West Hampshire Water	1	1
Bristol Water	11	5
Cholderton and District Water	0	0
South West Water	29	3
SSE Water	1	0
Thames Water (Tidworth)	1	1
Wessex Water	19	9
Region overall	62	19

A summary of the nature, cause and duration of each incident, along with details of the Inspectorate's findings are set out in *Annex 3*. Most incidents were of relatively short duration and the company took action to inform stakeholders and safeguard consumers as appropriate.

Wider learning points from incident investigations in the region in 2008 are highlighted by the following cases:

Power failure at Purton works

- In June 2008, following local storms, the power supply failed at Purton works. Bristol Water had not put in place appropriate contingency arrangements with its electricity supplier prior to the incident. When assessing this incident the Inspectorate noted the vulnerability of the power supplies to the works given the fact that the company had deemed on site generators as impractical. However, a review of the company's Regulation 28 risk report revealed that this hazard (loss of power) had not been identified by the company through its water safety plan methodology. Companies are reminded of the need to ensure that their risk assessments are based on a comprehensive assessment of all hazards and document all circumstances where power supplies are vulnerable giving details of the contingency arrangements in place.

Pesticide failure in Wimbourne zone

- A compliance sample taken on 28 March 2008 from a consumer's tap in the Wimborne zone was reported as containing the herbicide 2,4 dichlorophenoxy butyric acid. Bournemouth and West Hampshire Water's investigation established that its analytical provider had issued, for compliance sampling purposes, a bottle that had previously been used for making up a standard solution of 2,4 dichlorophenoxy butyric acid. The Inspectorate was highly critical of this example of poor laboratory practice and also noted the ineffective bottle washing arrangements in place. Companies are reminded of the need to actively manage the performance of analytical service providers and to take firm action when the service is substandard.

Degradation of new main lining at Woolcombe works

- In June 2007, Wessex Water appointed contractors to reline a 10km section of cast iron main between Summerhouse reservoir and Woolcombe works. In April 2008, however, investigations revealed that the lining was detaching in places, after fragments of polyurethane lining were detected in the main. The company instructed WRc Plc to undertake an independent and urgent review of the relining to determine its life expectancy and fitness for purpose. The Inspectorate was critical of the fact that the defects identified by WRc had not been identified previously by the company's own system for reviewing CCTV records. The Inspectorate expects companies and their contractors to follow national best practice as documented in Water UK Operational Requirements, 2007 and Code of Practice for In-situ Resin Lining of Water Mains, 2007. Wessex Water has acted to prevent a recurrence by making major changes to the supervisory arrangements for contractors working on their behalf.

The Inspectorate is considering the offence of failing to adequately treat or disinfect water in respect of one incident which occurred in the region during 2008.

Technical audit activity in the region

The Inspectorate has operated a risk-based approach to technical audit since 2005. In line with better regulation principles, no technical audit takes place without a reason and those that are carried out are targeted on the basis of an assessment of risk.

The Inspectorate's tool for generating the technical audit programme looks at critical components of the safe management of drinking water supplies including information on water quality monitoring, incident assessments, previous audits, consumer complaints and other relevant intelligence.

Through this ranking of all relevant water company assets, procedures and practices inspectors are able to prioritise and focus their technical audit work where it will have most benefit.

Information on the key findings of the technical audits undertaken during 2008 in the Western region is set out in Table 17.

Table 17: Summary of the Inspectorate’s technical audits in the region

Site name	Audit topic	Main findings from audit
South West Water		
Admiralty and coastal reservoirs	Microbiological contamination and elevated chlorine concentrations in supply.	Generally satisfactory. Recommended installation of on site chlorine monitoring equipment.
Note: a further two audits were carried out in the Western region towards the end of 2008 details of which will be included in <i>Drinking Water 2009</i> .		

Local authority engagement

Public water supplies – risk assessments

Section 77 of the Water Act 1991 places a duty on local authorities to keep themselves informed about the quality of drinking water supplies to premises in their area. Until now, local authorities’ routine involvement with public water supplies has mainly related to working level contacts with water companies about consumer complaints and the results of testing at consumers’ taps. The amendment of the drinking water regulations in December 2007, which introduced a requirement for comprehensive risk assessments for each water supply system, introduced a new mechanism for local authority engagement with water companies about the safety and security of public water supplies in their area. By 1 October 2008, water companies were required to complete Regulation 27 risk assessments using water safety plan methodology for each water supply system. The output of this work was a Regulation 28 report to the Inspectorate and a plan for communicating the content of each risk assessment to relevant local authorities and local health protection professionals in the Health Protection Agency.

A total of 796 Regulation 27 risk assessments are now in place across England and Wales. In *Annex 6* of this report we have listed, for each of the 33 local authorities in the Western region, the number of risk assessments that cover all or part of their area. The Inspectorate encourages local authorities to check that companies have contacted them about each relevant risk assessment.

During 2009, the Inspectorate will be assessing each water company risk assessment. The Inspectorate has the power to issue notices to require improvements to be made and copies of any such notices will be sent directly to the relevant local authorities.

Private water supplies

Local authorities have direct responsibility for ensuring the wholesomeness and safety of private water supplies in the region and can call on the Inspectorate for technical advice when required. In the Western region, local authorities hold information regarding 8,996 private water supplies. Table 18 provides information on the numbers of supplies grouped by volume of water supplied per day.

Table 18: Number of private water supplies supplying given volumes of water per day

	Number of private water supplies supplying volume indicated			
	<10m ³ per day	10m ³ – 99m ³ per day	100m ³ – 399m ³ per day	400m ³ – 1,000m ³ per day
England				
Central region	6,341	421	12	11
Eastern region	2,118	215	23	13
Northern region	5,496	352	19	15
Southern region	454	56	129	6
Thames region	1,056	206	126	5
Western region	8,414	550	27	5
Total for England	23,879	1,800	336	55
Wales	3,562	355	4	30
Total for England and Wales	27,441	2,155	340	85

Following a review of the Private Water Supplies Regulations 1991, the Department for the Environment, Food and Rural Affairs (Defra), issued a consultation document on proposed new regulations (the Private Water Supplies (England) Regulations 2009)². The consultation period ran from 11 August to 3 November 2008. The purpose of the change is to transpose the requirements of the 1998 EU Drinking Water Directive into law and to protect the health of consumers who rely on private water supplies for drinking and food preparation. The consultation recognised that existing arrangements for the safety and security of private water supplies were not adequate. Similar changes are proposed for Wales and the Welsh Assembly Government. The closing date for the consultation was 8 June 2009³.

Defra published the 105 responses received during the consultation period⁴. The key points made by respondents are:

- The maximum fees proposed were considered insufficient to cover local authority costs in carrying out risk assessments and monitoring.
- There is a need for guidance on the definition of private distribution system.
- The proposed timescale of six months for data collection by local authorities is too short.
- The 30 year retention period for data is too long and not consistent with other data collection requirements.
- Small shared domestic supplies was a category that posed a higher risk and the monitoring proposals for these were considered insufficient.

In parallel to the above activities, the Inspectorate has been working closely throughout the year with local authorities to develop the technical guidance that needs to be in place to enable implementation of the new private water supply regulations. A national stakeholder group was formed to identify and understand the issues which emerged during the consultation and to take forward the work of developing and disseminating best practice. Two key areas of work have been identified by the Inspectorate: developing with local authorities and software houses

² Consultation for England available at

<http://www.defra.gov.uk/corporate/consult/private-watersupplies/index.htm>

³ Consultation for Wales available at

<http://wales.gov.uk/consultations/environmentandcountryside/privatewater/?lang=en>

⁴ Summary Document available at

<http://www.defra.gov.uk/corporate/consult/private-watersupplies/summary-responses.pdf>

effective systems and methods for data capture and reporting, and national training tools and programs. Local authorities have requested web-based information and the Inspectorate is working with the Chartered Institute of Environmental Health and the Local Authorities Coordinators of Regulatory Services on putting this in place.

Through its role in the management of Defra's Water Quality and Health Research Programme the Inspectorate has identified, and will be commissioning appropriate research to improve the evidence base on risks relating to private water supplies.

For further information on the Water Supply (Water Quality) Regulations 2000 (amendment) Regulations 2007, or the microbiological and chemical parameters covered by the regulations please refer to the DWI website: <http://www.dwi.gov.uk>

If you have a need for more specific information than that on our website, please contact us on the DWI enquiry line: 020 7270 3370.

Annex 1

Further sources of information

The publication *Drinking water 2008* comprises the regional reports for England and a report covering Wales. There are six regional reports for England (Central, Eastern, Northern, Southern, Thames and Western) and one for Wales (in two languages). Each report presents monitoring data from 2008 under the following headings:

- Introduction to the report for the region
- Summary of the Drinking Water Inspectorate's conclusions about drinking water quality in the region
- Water supply arrangements
- Drinking water quality testing
- Drinking water quality results
- Consumer perceptions of drinking water
- Incidents in 2008
- Technical audit activity in the region
- Local authority engagement.

Each report begins with a short summary of the Inspectorate's conclusions about drinking water quality in the region in 2008.

The reports and other content are published on the DWI website at <http://www.dwi.gov.uk>

Content of the CD

The CD supplied with the printed report holds all of the above content and additionally it contains:

Water company look-up tables

These summarise all the results of water company monitoring in 2008. They provide information on:

- what was tested
- how many tests were performed
- the range of the results of testing
- how many tests failed to meet the standards.

Incidents in England and Wales 2008

To promote shared learning, the Inspectorate has compiled a list of all incidents that occurred in 2008 which illustrate the nature and cause of each incident, the main actions by the company and findings from the

inspectors' assessments. Relevant content from this overall list is contained in an annex to each regional report.

List of risk assessments by local authority

This is a reference list for local authorities letting them know how many risk assessments have been carried out by each water company supplying drinking water in their area.

Annex 2

Glossary and description of standards

These definitions will assist the understanding of the report where technical terms have been used.

1,2-Dichloroethane	is a solvent that may be found in groundwater in the vicinity of industrial sites. Where necessary it can be removed by special water treatment. A European health-based standard of 3µg/l applies.
Acrylamide	European health-based standard. A monomer is not normally found in drinking water. It is produced in the manufacture of polyacrylamides occasionally used in water treatment. Its presence in drinking water is limited by control of the product specification. Standard is 0.1µg/l.
Aggressive	a term used to indicate that the water has a tendency to dissolve copper (and other metals) from the inner surface of a pipe or water fitting such as a tap.
Aesthetic	associated with the senses of taste, smell and sight.
Alkali	a solution containing an excess of free hydroxyl ions, with a pH greater than seven.
Aluminium	occurs naturally in some source waters. It is removed from drinking water by conventional water treatment (coagulation and filtration). Aluminium sulphate and polyaluminium chloride may be used as water treatment chemicals at some water treatment works. A national standard of 200µg/l applies.
Ammonium	salts are naturally present in trace amounts in most waters. Their presence might indicate contamination of sanitary significance and they interfere with the operation of the disinfection process. An indicator parameter with a guide value of 0.5mg/l.
Analytical quality control (AQC)	the method used to ensure that laboratory analysis methods are performing correctly.

Antimony	is rarely found in drinking water. Trace amounts can be derived from brass tap fittings and solders. A European health-based standard of 5µg/l applies.
Aquifer	water-containing underground strata.
Arsenic	occurs naturally in only a few sources of groundwater. Specific water treatment is required to remove it. A European health-based standard of 10µg/l applies.
Authorised departure	authorisation for a water company to temporarily supply water exceeding a drinking water standard, granted by the authorities only when there is no risk to human health.
Benzene	is present in petrol. It is not found in drinking water, but it can migrate through underground plastic water pipes if petrol is spilt in the vicinity. Some bottled waters and soft drinks which include sodium benzoate as an ingredient have been reported as containing benzene. A European health-based standard of 1µg/l applies.
Benzo(a)pyrene (BaP)	is one of several compounds known as polycyclic aromatic hydrocarbons (PAHs). Their source in drinking water is as a result of deterioration of coal tar, which many years ago was used to line water pipes. Due to extensive water mains refurbishment and renewal it is now rare to detect this substance in drinking water. A European health-based standard of 0.01µg/l applies.
Boron	in surface water sources comes from industrial discharges or from detergents in treated sewage effluents. The very low concentrations found in some drinking waters are not a concern to public health. A European health-based standard of 1mg/l applies.
Bromate	can be formed during disinfection of drinking water through a reaction between naturally occurring bromide and strong oxidants (usually ozone). It may be generated in the manufacture of sodium hypochlorite disinfectant. Exceptionally, groundwater beneath an industrial site can become contaminated with bromate. A European health-based standard of 10µg/l applies.
Bulk supply	water supplied in bulk, usually in treated form, from one water company to another.

Cadmium	is rarely detected in drinking water and trace amounts are usually due to dissolution of impurities from plumbing fittings. A European health-based standard of 5µg/l applies.
Chloramine	a substance formed by reaction between chlorine and ammonia, used as a disinfectant in distribution systems because of its long-lasting properties compared to chlorine.
Chloramination	the process of generating a chloramine disinfectant residual in water leaving a treatment works.
Chloride	is a component of common salt. It may occur in water naturally, but it may also be present due to local use of de-icing salt or saline intrusion. An indicator parameter with a guide value of 250mg/l.
Chlorine residual	the small amount of chlorine or chloramines present in drinking water to maintain its quality as it passes through the water company's network of pipes and household plumbing.
Chromium	is not present in drinking water. A European health-based standard of 50µg/l applies.
<i>Clostridium perfringens</i>	is a spore-forming bacterium that is present in the gut of warm-blooded animals. The spores can survive disinfection. The presence of spores in drinking water indicates historic contamination that requires investigation. The standard is 0 per 100ml.
Coagulation	a process employed during drinking water treatment to assist with the removal of particulate matter.
Coliform bacteria	are widely distributed in the environment often as a result of human or animal activity, but some grow on plant matter. Their presence in a water supply indicates a need to investigate the integrity of the water supply system. The standard is 0 per 100ml.
Colony counts	are general techniques for detecting a wide range of bacteria, the types and numbers being dependent on the conditions of the test. These counts, if done regularly, can help to inform water management, but they have no direct health significance. The standard is 'no abnormal change'.

Colour	occurs naturally in upland water sources. It is removed by conventional water treatment. A national standard of 20mg/l on the Platinum/Cobalt (Pt/Co) scale applies.
Communication pipe	the connection from the water main to the consumer's property boundary.
Compliance assessment	a comparison made by the Inspectorate of data gathered by water companies against standards and other regulatory requirements.
Compound	a compound consists of two or more elements in chemical combination.
Concessionary supplies	historical free supplies of water for a householder, established when a company wanted to lay mains across land and the landowner might agree, subject to a permission, to take a supply of water from the main.
Conductivity	is a non-specific measure of the amount of natural dissolved inorganic substances in source waters. An indicator parameter with a guide value of 2,500 μ S/cm.
Contact tank	a tank, normally situated on a treatment works site, which forms part of the disinfection process. A disinfectant chemical (normally chlorine) is dosed into the water as it flows into the tank. The period of time that the water takes to flow through the tank allows sufficient 'contact' time for the chemical to kill, or deactivate, any viruses or pathogenic organisms that may be present in the water.
Contravention	a breach of a regulatory requirement.
Copper	in drinking water comes mostly from copper pipes and fittings in households. In general, water sources are not aggressive towards copper, but problems very occasionally occur on new housing estates. These 'blue water' events can be avoided by good plumbing practices. A European health-based standard of 2mg/l applies.
<i>Cryptosporidium</i>	is a parasite that causes severe gastroenteritis and can survive disinfection. In the UK, continuous monitoring is undertaken at works classified by the company as being at significant risk.

Cyanide	is not present in drinking water. A European health-based standard of 50µg/l applies.
Dead leg	refers to a piece of piping which is stopped off at one end, but is connected to the supply at the other end and can result in stagnant water in the pipework.
Distribution systems	a water company's network of mains, pipes, pumping stations and service reservoirs through which treated water is conveyed to consumers.
Drinking water standards	the prescribed concentrations or values listed in regulations.
EC Drinking Water Directive	Council Directive 98/83/EC December 1998 – setting out drinking water standards to be applied in member states.
Enforcement action	the means, as set out in the Water Act 1989 and consolidated into the Water Industry Act 1991, by which the Secretary of State requires a water company to comply with certain regulatory requirements.
Enterococci	see <i>Escherichia coli</i> .
Environment Agency	the Environment Agency is responsible for maintaining or improving the quality of fresh, marine, surface and underground water in England and Wales.
Epichlorhydrin	can be found in trace amounts in polyamine water treatment chemicals. Its presence in drinking water is limited by control of the product specification. A European health-based standard of 0.1µg/l applies.
Epidemiology	a process of studying the distribution of cases of disease within a population in relation to exposure to possible sources of the infection, with a view to establishing the actual source of the infection.
<i>Escherichia coli</i> and Enterococci	are bacteria present in the gut of warm-blooded animals. They should not be present in drinking water and, if present, immediate action is required to identify and remove any source of faecal contamination that is found. The standard is 0 per 100ml.
Filtration	the separation of suspended particulate matter from a fluid.

Fluoride	occurs naturally in many water sources, especially groundwater. It cannot be removed by conventional water treatment so high levels must be reduced by blending with another low fluoride water source. Some water companies are required by the local health authority to fluoridate water supplies as a protection against tooth decay. The drinking water standard ensures levels are safe in either circumstance. Fluoridation of water is a Department of Health policy. A European health-based standard of 1.5mg/l applies.
Geosmin	a substance produced by the growth of algae, normally in surface waters which gives rise to a characteristic 'earthy' or 'musty' taste or odour.
Granular activated carbon	an adsorbent filtration media used to remove trace organic compounds from water.
Groundwater	water from aquifers or other underground sources.
Hydrogen Ion (pH)	gives an indication of the degree of acidity of the water. A pH of 7 is neutral; values below 7 are acidic and values above 7 are alkaline. A low pH water may result in pipe corrosion. This is corrected by adding an alkali during water treatment. A specification of between 6.5 and 9.5 applies.
Improvement programmes	water company improvement works, these are legally binding on the company and each programme will remedy an actual or potential breach of a drinking water standard within a specified time period.
Incident	an event affecting or threatening to affect drinking water quality.
Indicator parameter	something that is measured to check that control measures, such as water treatment, are working effectively.
Indicator organism	an organism which indicates the presence of contamination and hence the possible presence of pathogens.
Information Letter	formal guidance to water companies given by the Inspectorate and published on the Inspectorate's website at www.dwi.gov.uk
Inspectorate	The Drinking Water Inspectorate.

Iron	is present naturally in many water sources. It is removed by water treatment. Some iron compounds are used as water treatment chemicals. However, the commonest source of iron in drinking water is corrosion of iron water mains. A national standard of 200µg/l applies.
Lead	very occasionally occurs naturally in raw waters, but the usual reason for its presence in drinking water is plumbing in older properties. If the water supply has a tendency to dissolve lead then water companies treat the water to reduce consumer exposure. The permanent remedy is for householders to remove lead pipes and fittings. A European health-based standard of 25µg/l applies, but 10µg/l will apply from 2013 onwards.
Manganese	is present naturally in many sources and is usually removed during treatment. A national standard of 50µg/l applies.
Mean zonal compliance percentage	a measure of compliance with drinking water standards introduced by the Inspectorate in 2004.
Mercury	is not found in sources of drinking water. A European health-based standard of 1µg/l applies.
Microbiological	associated with the study of microbes.
m³/d	cubic metre per day.
mg/l	milligram per litre (one thousandth of a gram per litre).
MI/d	megalitre per day (one MI/d is equivalent to 1,000 m ³ /d, or to 220,000 gallon/d).
µg/l	microgram per litre (one millionth of a gram per litre).
New regulations	the Water Supply (Water Quality) Regulations 2000 Amended 2007 in England; the Water Supply (Water Quality) Regulations 2001 Amended 2007 in Wales.
Nickel	occurs naturally in some groundwater and where necessary special treatment can be installed to remove it. Another source of nickel in drinking water is the coatings on modern taps and other plumbing fittings. A European health-based standard of 20µg/l applies.

Nitrate	occurs naturally in all source waters although higher concentrations tend to occur where fertilisers are used on the land. Nitrate can be removed by ion exchange water treatment or through blending with other low nitrate sources. A European health-based standard of 50mg/l applies.
Nitrite	is sometimes produced as a by-product when chloramine is used as the essential residual disinfectant in a public water supply. Chloramine is the residual disinfectant of choice in large distribution systems because it is more stable and long-lasting. Careful operation of the disinfection process ensures levels of nitrite are kept below the standard. A European health-based standard of 0.5mg/l applies.
Odour	can arise as a consequence of natural processes in surface waters, particularly between late spring and early autumn. Water treatment with activated carbon or ozone will remove natural substances causing taste. The standard relates to the evaluations of a panel of people assessing samples in the laboratory.
Ofwat	the water industry's economic regulator.
Oocyst	the resistant form in which <i>Cryptosporidium</i> occurs in the environment, and which is capable of causing infection.
Organoleptic	characteristics of a substance as detected by our senses, for example taste, odour or colour.
Outbreak Control Team (OCT)	a team set up to investigate possible waterborne outbreaks of cryptosporidiosis, comprising members of the medical profession, as well as representatives of relevant local authorities and water companies.
Ozone process (ozonation)	the application of ozone gas in drinking water treatment.
Parameters	the substances, organisms and properties listed in Schedule 2 and Regulation 3 of the regulations. Parameter definitions can be found further on in this annex.
Pathogen	an organism which can infect humans and cause disease.
PCV	see 'Prescribed concentration or value'.

Periodic review	the economic regulator's process of setting water prices.
Pesticides	any fungicide, herbicide, insecticide or related product (excluding medicines) used for the control of pests or diseases.
Pesticides – organochlorine compounds (aldrin, dieldrin, heptachlor, heptachlor epoxide)	are no longer used in the UK because they are persistent in the environment. They are not found in drinking water. A European chemical standard of 0.03µg/l for each compound applies.
Pesticides – other than organochlorine compounds	is a diverse and large group of organic compounds used as weed killers, insecticides and fungicides. Many water sources contain traces of one or more pesticide as a result of both agricultural and non-agricultural uses, mainly on crops and for weed control on highways and in gardens. Where needed, water companies have installed water treatment (activated carbon and ozone) so that pesticides are not found in drinking water. Water companies must test for those pesticides used widely in their area of supply. Pesticide monitoring thus varies according to risk. A European chemical standard of 0.1µg/l for each individual substance and 0.5µg/l for the total of all pesticides applies.
Phosphate dosing	treatment of water that results in a protective film building up on the inside of pipes minimizing the likelihood of lead being present in drinking water supplied through lead pipes.
Plumbosolvency	the tendency for lead to dissolve in water.
Polycyclic aromatic hydrocarbons (PAHs)	is a group name for several substances present in petroleum-based products such as coal tar. (see Benzo(a)pyrene listed above for more information). A European health-based standard of 0.1µg/l for the sum of all the substances applies.
Powdered activated carbon (PAC)	powdered activated carbon is employed in treatment processes to remove pollutants.
Pre- and post- renovation assessment (PPRA)	a programme of assessment before and after mains renovation to demonstrate justification for the work, and the improvements achieved by the renovation.

Prescribed concentration or value (PCV)	the numerical value assigned to drinking water standards defining the maximal or minimal legal concentration or value of a parameter.
PR09	the periodic review process for setting water prices for 2010-2015.
Private supplies	water taken from private sources or supplied by non-licensed suppliers; supplies of water provided otherwise than by a statutorily appointed water undertaker.
Protozoan parasites	a single cell organism that can only survive by infecting a host.
Public Register	drinking water quality information made available to the public by water companies as required by regulations.
Public supplies	water supplied by a company licensed for that purpose.
Raw water	water prior to receiving treatment for the purpose of drinking.
Regulations	The Water Supply (Water Quality) Regulations 2000 Amended 2007 (England), 2001 Amended 2007 (Wales).
Remedial action	action taken to improve a situation.
Residual disinfectant	the small amount of chlorine or chloramines present in drinking water to maintain its quality as it passes through the water company's network of pipes and household plumbing.
Secretary of State	Secretary of State for Environment, Food and Rural Affairs.
Selenium	is an essential element and a necessary dietary component. Amounts in drinking water are usually well below the standard. A European health-based standard of 10µg/l applies.
Service connection	connection between the water company's main to a consumer's property.

Service pipe	the service pipe is the pipe that connects the consumer's property to the water company main. It comprises two parts – the communication pipe, which is the connection from the water main to the consumer's property boundary (normally at the outside stop tap), and the supply pipe, which runs from the boundary of the property to the consumer's inside stop tap.
Service reservoir	a water tower, tank or other reservoir used for the storage of treated water within the distribution system.
Sodium	is a component of common salt. It is present in seawater and brackish groundwater. Some treatment chemicals contain sodium. Concentrations in drinking water are extremely low, but some water softeners can add significant amounts to drinking water where they are installed in homes or factories. A national standard of 200mg/l applies.
Springs	groundwater appearing at the surface at the outcrop of the junction of a permeable stratum with an impermeable stratum.
Statement of intent	formal written acknowledgement from a water company about action it plans to take to address an actual or potential regulatory breach.
Sulphate	occurs naturally in all waters and is difficult to remove by treatment. An indicator parameter with a guide value of 250mg/l.
Supply pipe	pipe connecting between the boundary of a consumer's property to the inside stop tap.
Supply point	a point other than a consumer's tap authorised for the taking of samples for compliance with the regulations.
Surface water	untreated water from rivers, impounding reservoirs or other surface water source.
Taste	can arise as a consequence of natural processes in surface waters, particularly between late spring and early autumn. Water treatment with activated carbon or ozone will remove natural substances causing taste. The standard relates to the evaluations of a panel of people assessing samples in the laboratory.
Technical audit	the means of checking that water companies are complying with their statutory obligations.

Tetrachloroethane and Trichloroethene	are solvents that may occur in groundwater in the vicinity of industrial sites. Where necessary they are removed by specialist treatment. A European health-based standard of 10µg/l for the sum of both substances applies.
Tetrachloromethane	is a solvent that may occur in groundwater in the vicinity of industrial sites. Where necessary it is removed by specialist water treatment. A national standard of 3µg/l applies.
Time of supply	the moment when water passes from the water company's pipework into a consumer's pipework.
Total indicative dose	is a measure of the effective dose of radiation the body will receive from consumption of the water. It is calculated only when screening values for gross alpha or gross beta (radiation) are exceeded. An indicator parameter with a guide value of 0.10mSv/year.
Total organic carbon	represents the total amount of organic matter present in water. An indicator parameter with a guide value of 'no abnormal change'.
Toxicology	the study of the health effects of substances.
Treated water	water treated for use for domestic purposes as defined in the regulations.
Trihalomethanes	are formed during disinfection of water by a reaction between chlorine and naturally occurring organic substances. Their production is minimised by good operational practice. A European health-based standard of 100µg/l applies.
Tritium	is a radioactive isotope of hydrogen. Discharges to the environment are strictly controlled and there is a national programme of monitoring surface waters. An indicator parameter with a guide value of 100Bq/l.
Turbidity	is a measure of the cloudiness of water. At treatment works, measurement is an important non-specific water quality control parameter because it can be monitored continuously on line and alarms set to alert operators to deterioration in raw water quality or the need to optimise water treatment. An indicator parameter with a guide value of 1NTU. When detected at the consumer's tap it can arise from disturbance of sediment within water mains. A national standard of 4NTU applies in this case.

Vinyl chloride	may be present in plastic pipes as a residual of the manufacturing process of polyvinyl chloride (PVC) water pipes. Its presence in drinking water is controlled by product specification. A European health-based standard of 0.5µg/l applies.
Water supply zone	a pre-defined area of supply for establishing sampling frequencies, compliance with standards and information to be made publicly available.
WHO	World Health Organisation.
Wholesome/wholesomeness	a legal concept of water quality which is defined by reference to standards and other requirements set out in the regulations.

Annex 3

Incidents in the Western region in 2008

Date and duration (Company)	Area	Estimate of population affected	Nature and cause of the incident	Main actions and findings from the Inspectorate investigation
02 Feb 2008 For 5 days (WSX)	Tucking Mill Works Feeding Hampton Down service reservoir	26,000	Disinfection failure (excess dechlorination)	<p>Wessex Water action:</p> <ul style="list-style-type: none"> • Review of procedures • Shut down treatment works • Increased chlorine residuals at service reservoir • Sampled affected area <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Inadequate procedures for the commissioning of new plant/treatment processes, acting on alarms and briefing personnel after modifications at works • Inadequate design/operation of contact tank • Inadequate on-site investigation • Recommended protection against short circuiting of treated water on site
10 Mar 2008 For 24 hours (SWT)	Stithian works Roscrow, Carmanellis and Lanner Hill, and Chasewater	1,600	Elevated pH due to fault with lime dosing unit	<p>South West Water action:</p> <ul style="list-style-type: none"> • Flushed, rezones and sampled affected area • Retrained staff <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Overdosing due to problem with lime dosing plant

Date and duration (Company)	Area	Estimate of population affected	Nature and cause of the incident	Main actions and findings from the Inspectorate investigation
28 Mar 2008 For 1 day (BWH)	Wimborne	184,376	2,4-D pesticide contamination in consumer tap sample	<p>Bournemouth and West Hampshire Water action:</p> <ul style="list-style-type: none"> • Resampled and thorough investigation of laboratory <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Critical that company used bottles for sampling that had been used for making pesticide standards with insufficient washing • Recommended review of method for preparation and handling of pesticide standards
07 Apr 2008 For 1 day (WSX)	Woolcombe, south of Yeovil	500	Fragments of polyurethane lining detected at consumer's tap	<p>Wessex Water action:</p> <ul style="list-style-type: none"> • Sampled affected area • Commissioned independent investigation (WRc) • Kept consumers informed <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Quality of work by contractors inadequate • Critical that video checking by company of the relining was not robust, recommended following Code of Practice for in-situ resin lining of water mains 2007
27 May 2008 For 7 days (TMS)	Tidworth, Wiltshire	9,240	Elevated turbidity due to flooding	<p>Thames Water action:</p> <ul style="list-style-type: none"> • Sampled affected area • A raw water turbidity monitor installed at Tidworth Chalkpit water treatment works <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Critical of lack of prompt turbidity monitoring • Recommended the hi-hi turbidity alarm level be changed • Suitable shut down trigger at site required

Date and duration (Company)	Area	Estimate of population affected	Nature and cause of the incident	Main actions and findings from the Inspectorate investigation
20 Jun 2008 For 3 days (SWT)	Houndall works South Dartmoor and the eastern outskirts of Plymouth	18,000	Boil notice due to micro-biological contamination	<p>South West Water action:</p> <ul style="list-style-type: none"> • Issued boil notices, alternative supplies, flushed and sampled area <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Valve operations resulted in connection to a raw water main • This incident remains under investigation by the Inspectorate
22 Jun 2008 For 1 day (BRL)	Purton works	100,000	Power failure at treatment works	<p>Bristol Water action:</p> <ul style="list-style-type: none"> • Rezoned area (brought in water from different source) • Repaired faulty equipment • Review of procedures <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Lack of standby power generators on site and ineffective contingency arrangements with electricity supplier • Inadequate investigations into root cause • Inadequate risk assessment • Inadequate procedures • Unacceptable delay in notifying Inspectorate
15 Jul 2008 For 3 days (WSX)	Wellington, Somerset	5,000	Loss of supply / poor pressure due to valving operations	<p>Wessex Water actions:</p> <ul style="list-style-type: none"> • Sampled area • Implemented training programme for operatives <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Recommended that method statements are revised to provide greater assistance to operators, to ensure the exact location, sequence and rate of operation is clear • Recommended that the company take immediate steps to identify matters specified by Regulation 17(2)

Date and duration (Company)	Area	Estimate of population affected	Nature and cause of the incident	Main actions and findings from the Inspectorate investigation
17 Jul 2008 For 1 day (WSX)	Chaldon Herring, near Dorchester	250	Aeration and discolouration due to mains burst	<p>Wessex Water action:</p> <ul style="list-style-type: none"> • Flushed mains • Increased chlorine residuals at service reservoirs due to increased turbidity after mains burst • Repaired main • Sampled affected area <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Sampling was not timely enough • Inadequate procedures and geographical information systems inaccurate
29 Jul 2008 For 21 weeks (BRL)	Banwell and Rowberrow works Bristol	100,000	Pesticide (metaldehyde) detection	<p>Bristol Water action:</p> <ul style="list-style-type: none"> • Sampling enhanced • Used temporary alternate raw water supplies <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Initiated enforcement action, enabling the company to take action to control risk through catchment management
13 Aug 2008 For 7 weeks (BRL)	Purton works Mostly North Bristol	445,000	Earthy taste	<p>Bristol Water action:</p> <ul style="list-style-type: none"> • Sampled affected area • Flushed mains • Blended supply with another source <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Due to vegetation being cut in canal water source • Inadequate treatment process – filtration • Inadequate communications between Bristol Water and British Waterways

Date and duration (Company)	Area	Estimate of population affected	Nature and cause of the incident	Main actions and findings from the Inspectorate investigation
22 Aug 2008 For 10 days (WSX)	Dulverton Town	2,500	Burst main	<p>Wessex Water action:</p> <ul style="list-style-type: none"> • Flushed and repaired main. Provided an alternative supply by tanker/bowser • Sampled affected area <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Critical of risk assessment in respect of water quality and health and safety related matters in cases where work is being conducted on critical crossing or end of system mains
24 Sep 2008 For 1 day (SWT)	South Brent to Stanborough (South Devon)	1,500	Media interest due to burst main	<p>South West Water action:</p> <ul style="list-style-type: none"> • Provided bottled water on request • Provided an alternative supply by tanker/bowser • Flushed mains • Repaired main • Sampled affected area • Issued media statement • Area isolated <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Reiterated a recommendation to take samples following a burst

Date and duration (Company)	Area	Estimate of population affected	Nature and cause of the incident	Main actions and findings from the Inspectorate investigation
09 Oct 2008 For 1 day (WSX)	Isle of Portland, South Dorset	13,962	Discolouration	<p>Wessex Water action:</p> <ul style="list-style-type: none"> • Flushed mains • Review of procedures • Sampled affected area • Reminded staff of the importance to follow procedure <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Sampling was not timely or representative of water supplied during the incident • Company operative did not follow procedures
30 Oct 2008 For 72 hours (WSX)	Chard SR, Snowdon number 1 and 2 Service reservoirs Somerset	12,500	Boil water advice due to microbiological contamination at three service reservoirs	<p>Wessex Water action:</p> <ul style="list-style-type: none"> • Chlorinated reservoir on finding <i>E.coli</i> • Flushed reservoir • Issued boil notices and sampled <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Flooding event due to heavy rainfall • Inadequate investigations into root cause
08 Nov 2008 For 7 days (BRL)	Purton works, Littleton works, Gloucester Sharpness canal 16 water supply zones	1,052,500	Pesticide (metaldehyde) detection	<p>Bristol Water action:</p> <ul style="list-style-type: none"> • Company optimised treatment processes <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Initiated enforcement action, enabling the company to take action to control risk through catchment management

Date and duration (Company)	Area	Estimate of population affected	Nature and cause of the incident	Main actions and findings from the Inspectorate investigation
21 Nov 2008 For 12 hours (WSX)	Dunball Village	200	Loss of supplies due to mains burst	<p>Wessex Water action:</p> <ul style="list-style-type: none"> • Mains flushed and area rezoned • Carried out notifications <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Review of procedures in light of failure to collect samples
24 Nov 2008 For 5 weeks (BRL)	Stowey works and Littleton works Seven supply zones affected	74,800	Pesticide (metaldehyde) detection	<p>Bristol Water action:</p> <ul style="list-style-type: none"> • Sampled affected area <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Initiated enforcement action, enabling the company to take action to control risk through catchment management
07 Dec 2008 For 1 hour (WSX)	Market Lavington (Easterton works), Wiltshire	5,175	Elevated turbidity in treated water	<p>Wessex Water action:</p> <ul style="list-style-type: none"> • Manual filter backwash, tankering to dilute reservoir and rezoning <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Turbidity due to problems with iron removal at works • Investigation ongoing

Incidents in the Western region outstanding from 2007

Date and duration (Company)	Area	Estimate of population affected	Nature and cause of the incident	Main actions and findings from the Inspectorate investigation
10 Aug 2007 For 7 hours (SWT)	Bovey Cross works Moreton-hampstead	3	Health and Safety incident due to incorrect chemical delivery	<p>South West Water action:</p> <ul style="list-style-type: none"> • Precautionary hospitalisation of three people • Reported 'Dangerous Occurrence' to the Health and Safety Executive • Building vented and tank contents removed from standby tank for disposal • Reviewed procedures with supplier and third party chemical delivery company • Disciplinary action <p>DWI comments and findings:</p> <ul style="list-style-type: none"> • Errors by operator and supplier in making the chemical delivery • No effect on water quality • Liaison with Health and Safety Executive to ensure their findings taken into account • Minded to recommend a review of chemical delivery procedures, but this had been done • Recommended refresher training and documentation

Note: A complete table of incidents in England and Wales in 2008 can be found on the CD in the folder. It is named **Incidents in England and Wales 2008.pdf**. It is also available on the DWI website at <http://www.dwi.gov.uk>

Annex 4

Improvement programmes in the region

Company	Parameter or hazard	Site	Status	Construction due for completion
Bristol Water	Iron and Manganese	Work on distribution system	Ongoing	31-Mar-10
Bristol Water	Iron and Manganese	Work on distribution system	Ongoing	31-Mar-10
Bristol Water	Taste and odour, Manganese and Arsenic	Cheddar	Completed 19-May-08	
Bristol Water	Taste and odour, Manganese and Arsenic	Rowberrow/ Banwell	Completed	
South West Water	Iron and Manganese	Work on distribution system	Ongoing	31-Dec-09
South West Water	Manganese	Stithians	Ongoing	31-Mar-10
South West Water	Manganese	Tamar	Ongoing	01-Apr-09
South West Water	Manganese	Avon	Ongoing	01-Apr-10
South West Water	Manganese	Lowermoor	Ongoing	31-Mar-10
South West Water	Manganese	Tottiford	Ongoing	01-Apr-11
South West Water	Manganese	Venford	Ongoing	31-Mar-10
South West Water	Taste and odour	Stithians	Ongoing	01-Jul-09
South West Water	Taste and odour	Tamar	Ongoing	31-Jul-08
Wessex Water	Chlorotoluron and Atrazine	Friar Waddon	Ongoing	Report regarding catchment management due 31-Jan-10
Wessex Water	Nitrate	Empool	Ongoing	Report regarding catchment management due 31-Jan-11
Wessex Water	Nitrate	Deans Farm	Ongoing	Report regarding catchment management due 30-Oct-09
Wessex Water	Nitrate	Eagle Lodge	Ongoing	Report regarding catchment management due 30-Oct-09

Company	Parameter or hazard	Site	Status	Construction due for completion
Wessex Water	Nitrate	Winterbourne Abbas	Ongoing	Report regarding catchment management due 30-Sep-09
Wessex Water	Taste and odour	Maundown	Ongoing	30-Apr-09

Annex 5

Competition in the water industry

The following table indicates the extent of competition in the water industry in England and Wales.

Inset appointments in place in 2008

Name	Licensed supplier	Original supplier*	Status
Buxted Chicken, Flixton	Anglian Water	Essex and Suffolk Water, Eastern region	Supplying water
Fairfield Park and Lower Wilbury Farm, Arlesey	Three Valleys Water	Anglian Water, Eastern region	Supplying water
Northern Foods (Bowyers), Trowbridge	Wessex Water	Wessex Water, Western region	Supplying water
Shotton Paper Works, Shotton	Albion Water	Dŵr Cymru Welsh Water, Wales	Supplying water
Tidworth near Andover	Thames Water	Wessex Water, Western region	Supplying water
Wynyard Business Park, near Wolveston	Hartlepool Water	Northumbrian Water, Northern region	Supplying water
Old Sarum, The Portway	SSE Water	Wessex Water, Western region	Supplying water
Longcroft Road, Corby	Independent Water Networks Ltd	Anglian Water, Eastern region	Supplying water
Priors Hall, Corby	Independent Water Networks Ltd	Anglian Water, Eastern region	Supplying water

New inset appointments in place for 2009

Name	Potential Licensed supplier	Original supplier*	Status
Tidworth near Andover	Veolia Water	Wessex Water, Western region	Appointment granted
Media City, Manchester	Peel Utilities	United Utilities, Northern region	Appointment granted
Valleywood near Llanilid	SSE Water	Dŵr Cymru Welsh Water, Wales	Appointment granted
Hale Village, Tottenham	SSE Water	Thames Water, Thames region	Appointment pending
Great Billing Way, Northampton	Independent Water Networks Ltd	Anglian Water, Eastern region	Appointment granted

*Original supplier at time of privatisation in 1989

Water supply license applications to date

Name of company	License type	Date license granted by Ofwat	Status
Aquavitae	Combined	1 December 05	Not yet operating
Watercall Ltd	Combined	1 December 05	Not yet operating
Severn Trent Water Select Ltd	Combined	1 December 05	Not yet operating
YorWater Ltd	Retail	21 March 06	Not yet operating
Satec Ltd	Combined	24 May 06	Not yet operating
UU Water Sales Ltd	Combined	3 January 07	Not yet operating
Osprey Water Services Ltd	Combined	3 January 07	Not yet operating

Annex 6

Regulation 27 risk assessments by local authority

Local authority	Company	Number of Regulation 27 risk assessments
Bath and North East Somerset Council	Bristol Water	8
	Wessex Water	3
Bournemouth Borough Council	Bournemouth and West Hants Water	3
Bristol City Council	Bristol Water	5
Christchurch Borough Council	Bournemouth and West Hants Water	4
Cornwall Council	South West Water	13
Cotswold District Council	Bristol Water	4
East Devon District Council	South West Water	8
East Dorset District Council	Bournemouth and West Hants Water	5
	Wessex Water	2
Exeter City Council	South West Water	4
Mendip District Council	Bristol Water	12
Mid Devon District Council	South West Water	11
	Wessex Water	1
New Forest District Council	Bournemouth and West Hants Water	5
North Devon District Council	South West Water	7
North Dorset District Council	Wessex Water	10
North Somerset District Council	Bristol Water	9
Plymouth City Council	South West Water	5
Poole Borough Council	Bournemouth and West Hants Water	3
	Wessex Water	4
Purbeck District Council	Wessex Water	4
Sedgmoor District Council	Bristol Water	7
	Wessex Water	5
South Gloucestershire District Council	Bristol Water	6
	Wessex Water	1
South Hams District Council	South West Water	9
South Somerset District Council	South West Water	6
	Wessex Water	12
Stroud District Council	Bristol Water	3
Taunton Deane District Council	South West Water	10
	Wessex Water	5
Teignbridge District Council	South West Water	11
Test Valley Borough Council	Bournemouth and West Hants Water	1
	Cholderton and District Water	1
	Wessex Water	1
Torbay Council	South West Water	3
Torriford District Council	South West Water	7

Local authority	Company	Number of Regulation 27 risk assessments
West Devon Borough Council	South West Water	11
West Dorset District Council	South West Water Wessex Water	6 20
West Somerset District Council	Wessex Water	5
Weymouth and Portland Borough Council	Wessex Water	2
Wiltshire Council	Bristol Water	3
	Cholderton and District Water	1
	SSE Water	1
	Wessex Water	40

Annex 7

Water company data summary tables

Bristol Water plc

Water supply arrangements

Company assets		Water supplied	
Number of treatment works	17	Water supplied (MI/day)	282
Number of service reservoirs	173	Percentage from surface sources	82
Number of water supply zones	52	Percentage from ground sources	13
Length of mains pipe (km)	6,632	Percentage from mixed sources	5
Population served		Area of supply	
Population supplied	1,092,022	Gloucestershire, Wiltshire, Bristol, Somerset	
Number of local authorities	9		

Drinking water quality summary data

	Company figure			Industry average
	2006	2007	2008	2008
Overall drinking water quality*	99.95%	99.98%	99.97%	99.96%
Water treatment				
Process Control Index	99.94%	100%	99.99%	99.98%
Disinfection Index	99.98%	100%	99.98%	99.93%
Distribution systems				
Distribution Maintenance Index	99.66%	99.78%	99.82%	99.85%
Reservoir Integrity Index	99.95%	99.99%	99.97%	99.96%
Building water systems				
Parameters influenced by domestic water systems	99.88%	99.99%	99.92%	99.88%

Consumer contacts

	Company figure			Industry average
	2006	2007	2008	2008
Informing consumers				
Total number	516	1,092	1,015	N/A
Rate per 1,000 population	0.48	1.01	0.93	1.22
Acceptability of water to consumers				
Total number	2,844	2,927	4,373	N/A
Rate per 1,000 population	2.67	2.70	4.00	2.55

Complaints to the Drinking Water Inspectorate

A total of 1 consumer of Bristol Water plc directly contacted DWI in 2008.

Note: Summary results for each company of tests for individual parameters are supplied on the DWI website at <http://www.dwi.gov.uk>

* Overall drinking water quality as represented by mean zonal compliance for 39 parameters.

Bournemouth and West Hampshire Water plc

Water supply arrangements

Company assets		Water supplied	
Number of treatment works	7	Water supplied (MI/day)	115
Number of service reservoirs	20	Percentage from surface sources	85
Number of water supply zones	10	Percentage from ground sources	15
Length of mains pipe (km)	2,767	Percentage from mixed sources	0
Population served		Area of supply	
Population supplied	426,000	Parts of Dorset, Hampshire and Wiltshire	
Number of local authorities	6		

Drinking water quality summary data

	Company figure			Industry average
	2006	2007	2008	2008
Overall drinking water quality*	>99.99%	99.99%	99.92%	99.96%
Water treatment				
Process Control Index	99.93%	99.88%	99.97%	99.98%
Disinfection Index	99.88%	99.85%	99.72%	99.93%
Distribution systems				
Distribution Maintenance Index	100%	99.94%	100%	99.85%
Reservoir Integrity Index	99.85%	100%	99.95%	99.96%
Building water systems				
Parameters influenced by domestic water systems	99.96%	99.96%	99.85%	99.88%

Consumer contacts

	Company figure			Industry average
	2006	2007	2008	2008
Informing consumers				
Total number	101	104	184	N/A
Rate per 1,000 population	0.24	0.24	0.43	1.22
Acceptability of water to consumers				
Total number	629	331	397	N/A
Rate per 1,000 population	1.48	0.78	0.93	2.55

Complaints to the Drinking Water Inspectorate

A total of 1 consumer of Bournemouth and West Hampshire Water plc directly contacted DWI in 2008.

Note: Summary results for each company of tests for individual parameters are supplied on the DWI website at <http://www.dwi.gov.uk>

* Overall drinking water quality as represented by mean zonal compliance for 39 parameters.

Cholderton and District Water Company Ltd

Water supply arrangements

Company assets		Water supplied	
Number of treatment works	1	Water supplied (MI/day)	2
Number of service reservoirs	2	Percentage from surface sources	0
Number of water supply zones	1	Percentage from ground sources	100
Length of mains pipe (km)	30	Percentage from mixed sources	0
Population served		Area of supply	
Population supplied	2,100	Small parts of Dorset & Hampshire	
Number of local authorities	2		

Drinking water quality summary data

	Company figure			Industry average
	2006	2007	2008	2008
Overall drinking water quality*	100%	100%	100%	99.96%
Water treatment				
Process Control Index	100%	100%	100%	99.98%
Disinfection Index	100%	100%	100%	99.93%
Distribution systems				
Distribution Maintenance Index	100%	100%	100%	99.85%
Reservoir Integrity Index	100%	99.04%	100%	99.96%
Building water systems				
Parameters influenced by domestic water systems	100%	100%	100%	99.88%

Consumer contacts

	Company figure			Industry average
	2006	2007	2008	2008
Informing consumers				
Total number	0	0	0	N/A
Rate per 1,000 population	0	0	0	1.22
Acceptability of water to consumers				
Total number	0	0	0	N/A
Rate per 1,000 population	0	0	0	2.55
Complaints to the Drinking Water Inspectorate				
No consumers of Cholderton and District Water Company Ltd directly contacted DWI in 2008.				

Note: Summary results for each company of tests for individual parameters are supplied on the DWI website at <http://www.dwi.gov.uk>

* Overall drinking water quality as represented by mean zonal compliance for 39 parameters.

SSE Water

Water supply arrangements

Company assets		Water supplied	
Number of treatment works	0	Water supplied (l/day)	13,000
Number of service reservoirs	0	Percentage from surface sources	0
Number of water supply zones	1	Percentage from ground sources	100
Length of mains pipe (km)	2	Percentage from mixed sources	0
Population served		Area of supply	
Population supplied	<100	Old Sarum, near Salisbury	
Number of local authorities	1		

Drinking water quality summary data

	Company figure			Industry average
	2006	2007	2008	2008
Overall drinking water quality*	N/A	N/A	100%	99.96%
Water treatment				
Process Control Index	N/A	N/A	N/A	99.98%
Disinfection Index	N/A	N/A	N/A	99.93%
Distribution systems				
Distribution Maintenance Index	N/A	N/A	100%	99.85%
Reservoir Integrity Index	N/A	N/A	N/A	99.96%
Building water systems				
Parameters influenced by domestic water systems	N/A	N/A	100%	99.88%

Consumer contacts

	Company figure			Industry average
	2006	2007	2008	2008
Informing consumers				
Total number	N/A	N/A	0	N/A
Rate per 1,000 population	N/A	N/A	0	1.22
Acceptability of water to consumers				
Total number	N/A	N/A	0	N/A
Rate per 1,000 population	N/A	N/A	0	2.55
Complaints to the Drinking Water Inspectorate				
No consumers of SSE Water directly contacted DWI in 2008.				

Note: Summary results for each company of tests for individual parameters are supplied on the DWI website at <http://www.dwi.gov.uk>

* Overall drinking water quality as represented by mean zonal compliance for 39 parameters.

South West Water Ltd

Water supply arrangements

Company assets		Water supplied	
Number of treatment works	33	Water supplied (MI/day)	442
Number of service reservoirs	312	Percentage from surface sources	84
Number of water supply zones	23	Percentage from ground sources	6
Length of mains pipe (km)	15,000	Percentage from mixed sources	10
Population served		Area of supply	
Population supplied	1,571,000	Devon, Cornwall, Somerset (part), Dorset (part)	
Number of local authorities	14		

Drinking water quality summary data

	Company figure			Industry average
	2006	2007	2008	2008
Overall drinking water quality*	99.95%	99.95%	99.98%	99.96%
Water treatment				
Process Control Index	100%	99.91%	100%	99.98%
Disinfection Index	99.94%	99.93%	99.94%	99.93%
Distribution systems				
Distribution Maintenance Index	99.71%	99.75%	99.89%	99.85%
Reservoir Integrity Index	99.93%	99.95%	99.93%	99.96%
Building water systems				
Parameters influenced by domestic water systems	99.91%	99.92%	99.95%	99.88%

Consumer contacts

	Company figure			Industry average
	2006	2007	2008	2008
Informing consumers				
Total number	1,672	1,579	2,106	N/A
Rate per 1,000 population	1.05	0.98	1.34	1.22
Acceptability of water to consumers				
Total number	24,810	22,226	19,223	N/A
Rate per 1,000 population	15.55	13.81	12.24	2.55
Complaints to the Drinking Water Inspectorate				
A total of 6 consumers of South West Water Ltd directly contacted DWI in 2008.				

Note: Summary results for each company of tests for individual parameters are supplied on the DWI website at <http://www.dwi.gov.uk>

* Overall drinking water quality as represented by mean zonal compliance for 39 parameters.

Thames Water Utilities Ltd

Water supply arrangements

Company assets		Water supplied	
Number of treatment works	104	Water supplied (MI/day)	2,900
Number of service reservoirs	380	Percentage from surface sources	75
Number of water supply zones	238	Percentage from ground sources	25
Length of mains pipe (km)	31,411	Percentage from mixed sources	<1
Population served		Area of supply	
Population supplied	8,643,000	Bedfordshire (part), Berkshire (part), Buckinghamshire (part), Essex (part), Gloucestershire (part), Hampshire (part), Hertfordshire, Kent (part), Inner London, Outer London (part), Oxfordshire, Surrey (part), West Sussex (part), Warwickshire (part), Wiltshire (part)	
Number of local authorities	64		

Drinking water quality summary data

	Company figure			Industry average
	2006	2007	2008	2008
Overall drinking water quality*	99.97%	99.98%	99.99%	99.96%
Water treatment				
Process Control Index	99.99%	99.97%	>99.99%	99.98%
Disinfection Index	99.96%	99.98%	99.97%	99.93%
Distribution systems				
Distribution Maintenance Index	99.91%	99.95%	99.94%	99.85%
Reservoir Integrity Index	99.93%	99.94%	99.97%	99.96%
Building water systems				
Parameters influenced by domestic water systems	99.82%	99.87%	99.93%	99.88%

Consumer contacts

	Company figure			Industry average
	2006	2007	2008	2008
Informing consumers				
Total number	11,064	26,423	40,877	N/A
Rate per 1,000 population	1.34	3.17	4.73	1.22
Acceptability of water to consumers				
Total number	8,610	7,904	8,753	N/A
Rate per 1,000 population	1.04	0.95	1.01	2.55

Complaints to the Drinking Water Inspectorate

A total of 11 consumers of Thames Water Utilities Ltd directly contacted DWI in 2008.

Note: Summary results for each company of tests for individual parameters are supplied on the DWI website at <http://www.dwi.gov.uk>

* Overall drinking water quality as represented by mean zonal compliance for 39 parameters.

Wessex Water Services Ltd

Water supply arrangements

Company assets		Water supplied	
Number of treatment works	96	Water supplied (MI/day)	353
Number of service reservoirs	303	Percentage from surface sources	27
Number of water supply zones	93	Percentage from ground sources	71
Length of mains pipe (km)	11,000	Percentage from mixed sources	2
Population served		Area of supply	
Population supplied	1,182,000	Large parts of Somerset, Dorset and Wiltshire, small areas of Gloucestershire and Devon	
Number of local authorities	15		

Drinking water quality summary data

	Company figure			Industry average
	2006	2007	2008	2008
Overall drinking water quality*	99.97%	99.97%	99.96%	99.96%
Water treatment				
Process Control Index	99.99%	>99.99%	100%	99.98%
Disinfection Index	99.93%	99.93%	99.96%	99.93%
Distribution systems				
Distribution Maintenance Index	99.96%	99.90%	99.97%	99.85%
Reservoir Integrity Index	99.96%	99.92%	99.95%	99.96%
Building water systems				
Parameters influenced by domestic water systems	99.82%	99.84%	99.81%	99.88%

Consumer contacts

	Company figure			Industry average
	2006	2007	2008	2008
Informing consumers				
Total number	2,072	1,748	2,859	N/A
Rate per 1,000 population	1.75	1.48	2.42	1.22
Acceptability of water to consumers				
Total number	3,069	3,407	3,639	N/A
Rate per 1,000 population	2.60	2.88	3.08	2.55
Complaints to the Drinking Water Inspectorate				
No consumers of Wessex Water Services Ltd directly contacted DWI in 2008.				

Note: Summary results for each company of tests for individual parameters are supplied on the DWI website at <http://www.dwi.gov.uk>

* Overall drinking water quality as represented by mean zonal compliance for 39 parameters.



guardians of drinking water quality

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<http://www.dwi.gov.uk>