Water Quality
Report 2009

South Staffs Water

Contents

Introduction

I am pleased to be able to present to you the Water Quality Report summarising the results of samples collected during 2009 for compliance with the Water Supply (Water Quality) Regulations 2000 (Amended) 2007.

In this day and age when health professionals place great emphasis on the health benefits of drinking plenty of tap water, South Staffs Water is very happy to report that during 2009 the Company complied with greater than 99.99% of all tests carried out on drinking water supplies. The result is the best ever compliance rate achieved by the Company and puts us in a very strong position as one of the top companies for the quality of our water supply. At such a high level of compliance it is appreciated that it becomes increasingly difficult to maintain year on year improvement. Nevertheless, the challenge to achieve 100% is there and we will continue to work with all our stakeholders to attain it.

The achievement was in no small part due to the two operational strategies of DOMS (Distribution Operation and Maintenance Strategy) and WaSPs (Drinking Water Safety Plans). These strategies have changed the way the Company approaches the protection of water quality. Rather than simply focussing on passing water quality standards, the strategies are based on risk assessments. Every step of the production process (abstraction, treatment, storage, distribution and household plumbing) is assessed to identify any risks of tainting or contaminating the water. If any risk is apparent, then these are removed or reduced in some manner.

For example, South Staffs Water is committed to developing and implementing catchment management controls with the Environment Agency and other catchment stakeholders to minimise the occurrence of pesticides in raw water sources.

Compliance with the drinking water standard for lead continues to be good, however, the Company is committed to carrying out further actions to further improve this and minimise the effects of lead based pipes. In 2010 work with local and health authorities will be progressed to develop action plans to identify vulnerable groups and associated risk based lead pipe replacement strategies. This will include educating and informing customers of the occurrence and health effects of lead in drinking water.

Whilst a fully continuous and wholesome supply remains of the highest priority, associated with a great quality of tap water is the need to deliver excellent customer service. I believe that customers who have cause to contact the Company should now receive a first class service in a genuine attempt to resolve any issue, whether it be with the water supply or household plumbing.

In summary, the Company is in a great position, but with more to achieve!

Dr Mike Turrell
Director of Water Quality

Summary Information of Water Supplied

- In 2009 water quality continued to be of a very high standard with only five mandatory tests failing to meet the exacting standards of the Water Quality Regulations resulting in an overall compliance rate of 99.99%, the best ever compliance rate achieved by the Company.
- Water is supplied to nearly 1.25 million people with an average total of 312 megalitres (million litres) of drinking water pumped to customers' taps per day.
- Water is abstracted from two surface water sources and 22 boreholes prior to being treated and distributed to our customers via nearly 6,000 kilometres of water mains and 35 service reservoirs.
- Over 50% of the water supplied is derived from surface water sources. The remainder is derived from underground borehole sources.
- The supply area is divided into 20 supply zones within which water use can be accurately monitored.

Water Quality Regulation

The Water Supply (Water Quality) Regulations 2000 (amended 2007,) provide the regulatory framework for securing the quality of drinking water supplies in England and Wales. This report provides a useful source of reference for the quality of the drinking water supplied to your area during 2009.

The Regulations

At the end of 2000, the "Water Supply (Water Quality) Regulations 2000" were published. These regulations replaced the 1989 regulations and fully incorporate, and go beyond, the requirements of the 1998 European Drinking Water Directive on the quality of drinking water. The new regulations came into force, in full, on 1st January 2004 and included the requirements to monitor for new parameters, namely benzene, bromate and 1,2 –dichloroethane, and to monitor against revised standards for a small number of parameters.

Further amendments to the Regulations came into force on 22nd December 2007 and included placing more emphasis on risk assessments and changing the requirements for provision of information. The amended Regulations are known as the Water Supply (Water Quality) Regulations 2000 (Amendment) Regulations 2007.

The Drinking Water Inspectorate (DWI) monitors and enforces these regulations on behalf of the Secretary of State for the Environment, Food and Rural Affairs (DEFRA) and the National Assembly for Wales. The DWI is supplied with regular detailed reports from all water companies in England and Wales, and independently reviews the information provided. The DWI also assesses the wholesomeness of water supplies and undertakes technical audits of water suppliers to examine all aspects of water quality, treatment and monitoring.

Monitoring Water Supplies

For monitoring purposes, samples are collected and analysed at all stages of distribution from treatment works, service reservoirs and randomly selected customers taps. These samples form part of an extensive sampling programme undertaken to ensure the continuing wholesomeness of the supply and full compliance with the Regulations.

During 2009 the Company analysed over 70,000 parameters for compliance purposes. These fall broadly into three categories:

- Bacteriological including coliform organisms and cryptosporidia
- Physico-chemical such as pH, nitrate, iron, lead and PAH
- Aesthetics such as taste, odour and colour.

Parameters are classed as either Mandatory (Schedule 1) parameters that are given a specific prescribed concentration or value (PCV) set by the Regulations or are indicator parameters that have a non-mandatory specification. Indicator and mandatory parameters are listed separately in Appendix 1, which summarises the analytical results for samples collected during 2009. The standards for each of the parameters measured can be found in Appendix 2.

Although this monitoring provides an important check on the quality of our supplies, the delivery of safe and wholesome drinking water depends on the design, operation and maintenance of our treatment works and distribution system. The water quality results reported here reflect the efforts of a large number of people engaged in an ongoing process to maintain and improve supplies to our customers.

Hampton Loade Treatment Works and Chelmarsh reservoir

Laboratory Analysis

Analysis of the highest quality is essential when testing the drinking water supplied to our customers. Our service provider offers extensive analytical water testing capabilities, with over 25 years experience in the analysis of drinking water, backed by the security of DWI auditing and UKAS accreditation to ISO 17025.

Highly trained analysts operating from a state-of-the-art laboratory offer the full range of microbiological and chemical parameters to meet regulatory drinking water requirements as well as additional capabilities. Sample types covered include potable water, bottled mineral water, raw and process waters. In 2009 South Staffs Water submitted over 50,000 samples for analysis to our analytical provider, which included both regulatory and operational samples.

Undertakings and Authorised Departures

Under certain conditions a water supply may not comply with the Regulations and quality standards may be contravened, for instance due to the condition of unlined mains. The Company will investigate the cause of the problems and identify options for remediation of supplies and in these circumstances the Secretary of State will accept an undertaking from the Company to carry out a programme of works that will rectify the problem and enable full compliance with the Regulations.

Authorised departures may also be entered into where an EC directive standard is contravened.

In 2009, there was one undertaking in place for the pesticide metaldehyde in water supplied from Seedy Mill and Hampton Loade treatment works.

The undertaking includes a series of ongoing measures to investigate and reduce the level of metaldehyde in the catchment areas supplying the two treatment works. Actions to reduce the impact of metaldehyde are primarily focussed on catchment management.

Cryptosporidium

Cryptosporidium is a small parasitic organism that infects the small intestine of a variety of mammals, including humans. There are many potential sources of cryptosporidium other than water and infection may occasionally lead to the illness cryptosporidiosis, a form of diarrhoea.

In accordance with the Water Supply (Water Quality) Regulations 2000 all of the Company's sites were risk assessed for the potential for cryptosporidium to be present in the water before treatment. As a result of these risk assessments one of the Company's works, Hampton Loade Treatment works is currently designated as requiring continuous sampling for this organism. The 2000 Regulations required that the average number of cryptosporidium oocysts in a minimum sample of 1,000 litres should be less than one in 10 litres. The amended regulations in 2007 have removed the treatment standard of one oocysts in 10 litres and the way in which samples can be collected and transported. This amendment has not changed the sampling frequency or the sites monitored.

A total of 373 regulatory samples were analysed for cryptosporidium from Hampton Loade Treatment Works, which abstracts water from the River Severn in Shropshire. Not unexpectedly a very low number of cryptosporidium oocysts were detected in one sample. In this case there was no treatment deficiencies and re-samples were all satisfactory.

Documented procedures have also been developed and used successfully to notify the relevant health authorities of any oocysts that are detected so that any corresponding increase of illness within the community can be monitored.

Drinking Water Safety Plans

Measures to protect the whole water cycle from 'Source to Tap' continues to be a focal point for the Company and is borne out by the ongoing support and application of our Drinking Water Safety Plans (WaSPs). Fundamentally, the process involves the successful examination and management of risk throughout the key stages of water supply through; Catchment, Treatment Storage and Distribution to the point of use by the customer.

The specific details of the WaSP have been submitted to the Drinking Water Inspectorate (DWI) and although only a limited amount of feedback has been received the plans are, however, integral to the business and continue to undergo programmed reviews incorporating both performance and operational analysis. In addition, during the latter part of 2009 the whole WaSP process was subjected to an annual review where the general approach to WaSPs was reassessed to confirm validity and opportunities for process improvement were identified.

Performance to date has been excellent and by continuously exploring and managing both the current and potential risks to the potable water supply, the Company can continue to maintain the highest levels of water quality.

The process has many stakeholders and in order that water quality compliance and customer satisfaction is maintained, ongoing liaison and dialogue is important, and therefore we are continuing to engage with various groups and organisations including the Environment Agency, Natural England, the Voluntary Initiative Group and local health organisations.

Water Treatment

Water supplied to our customers is treated at 25 source sites. These comprise two surface water sites (rivers or surface water reservoirs) and 23 groundwater sites (boreholes).

The quality of raw water at surface water sites, such as the River Severn can be extremely variable, with heavy rainfall causing rapid increases in colour, turbidity and bacterial content as well as washing a variety of potential contaminants, for example pesticides, into the raw water. Water from surface sources may also contain significant quantities of algae in summer months. The treatment process at these sites is complex to ensure that water supplied to customers is always compliant with the water quality regulations regardless of the quality of raw water.

Quality of raw water at groundwater sites is much more consistent, although there are a number of sites where specific treatments are required. Nine sources have elevated nitrate levels; three of these are treated at site with nitrate removal plants, whilst the remainder are blended with low nitrate sources to ensure compliance. Specific treatments at other groundwater sites include processes for the removal of iron, manganese, pesticides and membranes for the removal of any cryptosporidia organisms. One groundwater source also receives treatment to reduce hardness levels.

All treatment processes are continually monitored by the Company's advanced computer control systems. These continuously process information from a wide variety of on-line instrumentation to ensure treatment is closely controlled, with all critical alarms relayed to manned control rooms.

Following treatment, water is pumped to one of 35 enclosed service reservoirs and water towers, which balance the rates of water production and customer demand.

Seedy Mill Treatment Works

Drinking Water Quality

The Chief Inspector's Report (CIR) was launched in June 2010 and summarises the quality of water supplied throughout England and Wales during 2009. This section provides a summary of the water quality samples collected from pumping stations, potable storage reservoirs and customer taps during 2009.

Quality of Water Leaving Treatment Works

Over 32,000 parameters were analysed at treatment works during 2009. Coliforms were detected in four samples. This parameter is classed as an indicator parameter and is not considered to be detrimental to health. All re-samples were satisfactory. E.coli was detected in two out of 730 samples at Hampton Loade Treatment Works. All samples in distribution and re-samples at the treatment works were satisfactory. A full investigation and operation review of Hampton Loade has been undertaken. It was initially considered that the sporadic microbiological detections may be due to a contaminating influence. Following a comprehensive and exhaustive series of investigations, no such influence could be found at the works and it is believed that the treatment process and associated assets were operating adequately. There have been no failures since.

Table 1 below highlights the results of the two indices used by the DWI to measure the Company's effectiveness at managing the risks to water quality that can arise as a consequence of water treatment. For 2009 the Process Control Index and the Disinfection Index were above the industry average.

Table 1 Water Treatment Indices for 2009

Water Treatment	Company Figure	Industry Average
Process Control Index	100%	99.97%
Disinfection Index	99.95%	99.94%

Quality of Water in Service Reservoirs

A total of 8,956 parameters were analysed at service reservoirs during 2009. There were only three samples that failed the coliform indicator parameter. Two re-samples were satisfactory. Coliform bacteria was found in one re-sample and as a result the reservoir was isolated and inspected. In the absence of any findings that could have attributed to the failure, the sampling facilities were replaced and there have been no further failures since.

Table 2 highlights the results of the two indices used by the DWI to measure the effectiveness of the Company strategy to maintain the distribution system (reservoir and pipes). For 2009 the Distribution Maintenance Index and the Reservoir Integrity Index were above the industry average.

Table 2 Service Reservoir Indices for 2009

Distribution Systems	Company Figure	Industry Average
Distribution Maintenance Index	100%	99.86%
Reservoir Integrity Index	99.92%	99.96%

Quality in Water Supply Zones

Coliforms were detected in 10 samples taken from seven water supply zones and E.coli was detected in one sample. All re-samples confirmed that supplies were satisfactory and the DWI has assessed all failures and no further actions are required.

Over 20,000 individual chemical parameter analyses were carried out during 2009. During 2009 there were no aluminium, iron, colour and turbidity failures primarily due to the Company's operational strategies of DOMS (Distribution Operational Maintenance Strategy).

Table 3 highlights the mean zonal compliance (MZC) result and parameters influenced by domestic water systems index for 2009. For 2009 the MZC and index influenced by domestic water systems were above the industry average.

Table 3 Customer Tap Indices for 2008

Customer Taps	Company Figure	Industry Average
Mean Zonal Compliance (MZC)	99.99%	99.95%
Paramers influenced by domestic water systems	99.95%	99.87%

Aesthetic Quality

Aesthetic parameters, such as clarity, taste and odour influence customers' perception of the quality of drinking water. The most common cause of concern over the taste is due to the presence of chlorine in the water. Chlorine is added in low concentrations to maintain the bacteriological quality of the water from the source (pumping station) through to the customer tap. Earthy and musty tastes and odours have also been reported. These are due to natural processes taking place in the storage reservoirs and pose no risk to health, or to stagnation in customer plumbing which can be alleviated by flushing the tap prior to use. A leaflet on common taste and odours occurring in water supplies can be found on the Company website (www.south-staffs-water.co.uk).

In 2009, the regulatory limit for taste and odour changed from three dilution number to one dilution number. Only one sample exceeded the relevant PCV for odour. All re-samples confirmed that supplies were satisfactory and there were no corresponding odour complaints at the time of the failure.

Other parameters that can affect the appearance of the water supplied include colour, turbidity, iron and aluminium. Over 1,000 samples were analysed for each of these parameters during 2009 and there were no failures.

In order to maintain high levels of customer service and satisfaction, the Company has one of the largest mains replacement programmes in percentage terms of the United Kingdom Water Industry. A major part of the Company's five-year business plan is to replace over 300km of water main, which is equivalent to over 5% of the total mains in the ground. The bulk of this programme will be to replace mains with the highest level of bursts. To support this programme the Company owns and operates a pipe laboratory which analyses samples of the main to determine their remaining life and suitability for inclusion in the rehabilitation/ replacement programme.

In order to minimise customer disruption during the mains replacement works, the Company endeavours to use techniques which do not involve digging, whenever possible. These methods include

Mains replacement

slip lining, which allows a new pipe to be inserted into the existing pipe, or pipe bursting where a new pipe of the same size, or in some cases larger, is driven into the old pipe. Both of these methods allow water supplies to be restored within the shortest possible period, reduce costs, minimise reinstatement costs and traffic disruption.

In support of the mains replacement programme, the Company also has a dedicated flushing team that undertakes water quality sampling and pro-active mains flushing on a regular basis in order to remove pipe sediments. The data collected through these activities provides a means of determining the benefits of capital and operational intervention together with any future expenditure requirements.

Pesticides

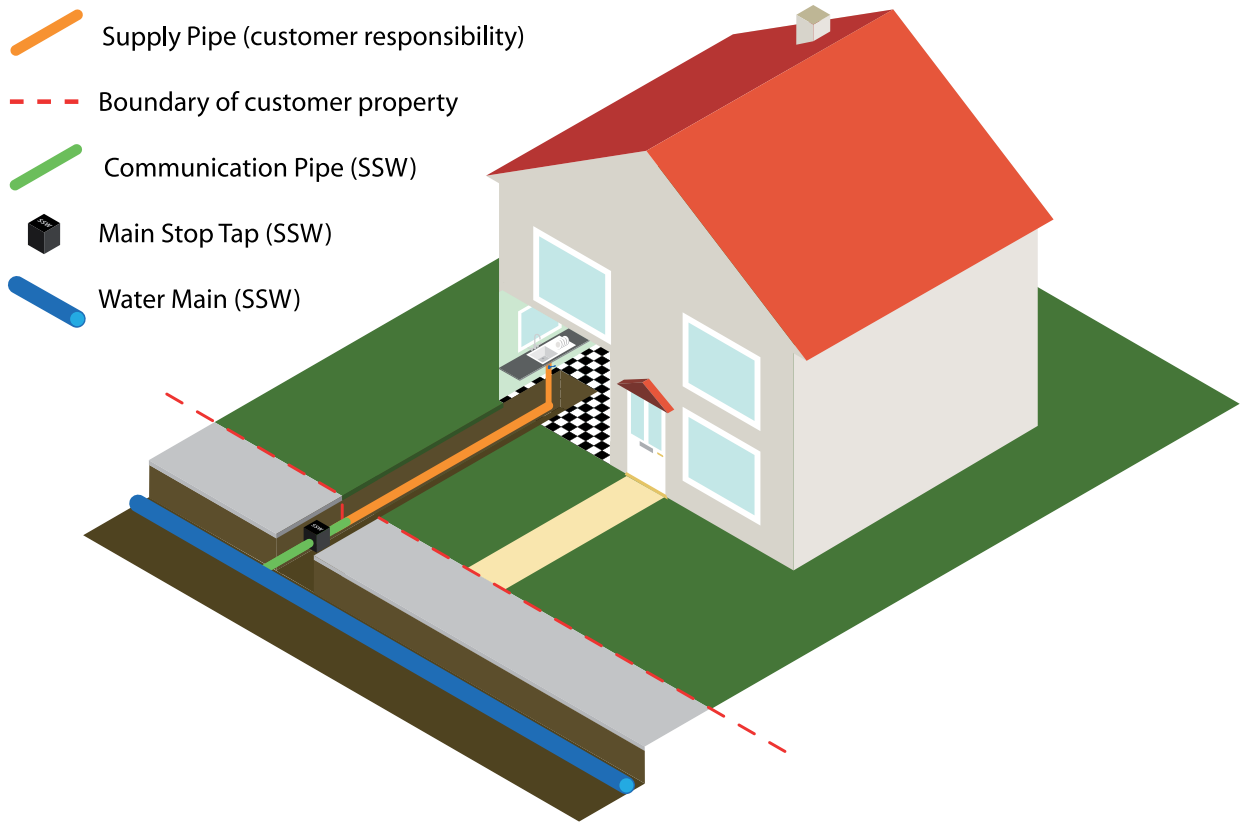
The regulatory standards for pesticides are extremely stringent at 0.1 µg/l for most pesticides and as low as 0.03 µg/l for a selected few. These are well below the World Health Organisation recommended levels, which are based on toxicological data.

Water companies are requested to assess the risk of drinking water supplies of pesticide use in their catchments and test for those, which might be present. South Staffs Water has documented potential and actual hazards through their risk assessments, which are informed by raw water monitoring and identify the control measures in place.

There were detections of metaldehyde, the active ingredient of some slug pellets, in drinking water supplies above the regulatory limit in 2009. At the very low levels detected there is no risk to human heath, however, the Company has agreed a programme of works (see Undertakings and Authorised Departures section above) to ensure compliance with the Regulations.

In addition to the standard for individual pesticide compounds, the regulations set a limit of 0.5 µg/l for the sum of all pesticide compounds detected in a sample; this standard was not exceeded in any sample during 2009. South Staffs Water is committed to developing and implementing catchment controls with the Environment Agency and other catchment stakeholders to minimise the occurrence of pesticides in raw water sources.

Blithfield reservoir



South Staffs Water has been involved in the Voluntary Initiative on Pesticides for the past six years. This collaborative scheme, sponsored by pesticide manufacturers, pesticide users and the water industry, is aimed at reducing the levels of pesticides in surface waters from agricultural use. The Company's Blithfield Reservoir was selected as one of six national pilot catchments where specific activities were targeted at farmers and other users to educate them on the safe, responsible use of pesticides.

Lead

The standard for lead in drinking water was reduced from 50 to 25 µg/l on 25th December 2003 as an interim measure towards a final standard of 10 µg/l on 25th December 2013. These changes result from a revised EC Directive for the Quality of Water for Human Consumption, adopted as part of the UK Water Supply (Water Quality) Regulations 2000.

Water is supplied into domestic households by a small diameter pipe connecting the Company's water main to the internal plumbing of the property. The part of this supply pipe between the water main and the property boundary is called the 'communication pipe' and is the Company's responsibility; that part of the pipe between the boundary and the property is called the 'service pipe' and is the customer's responsibility.

Water leaving Company source sites contains no lead. However, approximately half of all properties within the Company area have supply pipes and internal plumbing systems made wholly or partly of lead. Small amounts of lead can be dissolved from this plumbing into the water supply. To prevent this dissolution, the Company has been operating a plumbosolvency control strategy based on dosing phosphate into treated waters. This deposits an insoluble layer on the inside of lead pipes preventing further dissolution of lead.

The number of phosphate dosing schemes at source sites was increased from the mid 1990s, until by the end of 2001 nearly all water supplied was phosphate dosed. Extended optimisation of dosing since 2001 has resulted in steadily reducing lead levels at customer taps. In 2009 there were no exceedances of the 25 µg/l standard and only 1% of samples exceeded the 2013 standard of 10 µg/l. It is anticipated that continued optimisation of dosing schemes will further improve compliance with the new standard before 2013.

In order to further improve compliance with the future lead standard and to minimise the health effects caused by lead pipes, work with local and health authorities is being progressed. The aim of this is to develop action plans to identify vulnerable groups and associated risk based lead pipe replacement strategies. This will include educating and informing customers of the occurrence and health effects of lead in drinking water.

Although phosphate dosing prevents the dissolution of lead from pipework, it may not be effective against the 'flaking' of particles of lead from deteriorating pipework. The Company has a policy of replacement of lead communication pipes to domestic customers who are removing all the lead from their service pipe.

Nitrate

The Company has nine groundwater sources which exceed the Regulatory standard of 50 mg/l for nitrate. Three sources are treated for nitrate removal at source, with the remaining sites blended with water from low nitrate sources. Nitrate levels in some groundwaters continue to increase, and levels at all sources are closely monitored to assess requirements for future treatment schemes.

Nitrate Vulnerable Zones (NVZs) were first designated in 1996. Currently 55% of England is included in an NVZ. For South Staffs the whole of the Company area of supply is now designated as part of a NVZ. The Lichfield area was one of the original 1996 NVZs, as were the areas around Kinver and Hagley.

Since the introduction of revised NVZs in December 2002 farmers within these areas have had to follow Action Programmes of measures aimed at promoting best practice in the use and storage of fertiliser and manure. The original 1996 NVZs had lower limits for application of fertilisers than the newly designated areas. However, from December 2006 the same lower limits have applied to all NVZs. It is strongly believed that the creation of NVZs has significantly helped the Company by reducing or delaying the need for treatment or blending solutions.

Trihalomethanes (THMs)

Trihalomethanes are a group of organic substances that may be formed by the reaction of chlorine (applied as a disinfectant) to water containing naturally occurring organic material; this is most commonly present in water derived from surface sources (rivers and reservoirs).

Application rates of chlorine are carefully controlled to minimise the formation of THMs at source. A computer software model has been developed to predict when increased levels of THM may occur to allow modifications to source treatments to take place to reduce THM levels. Water is then monitored throughout the distribution system to ensure the treatments applied produce water that is always compliant with the stringent Regulatory standard.

Incidents

The Regulations require the Company to notify the DWI of any incidents that may have affected drinking water quality. During 2009 the Company notified the DWI of two events, both of which were classed as an event and related to Hampton Loade Treatment Works. Low levels of coliform and E.coli were detected in two samples out of 730. There were no detections in distribution and all re-samples were satisfactory. A full investigation and operation review of the works was carried out to ascertain the cause. It was initially considered that the sporadic microbiological detections may be due to a contaminating influence. Following a comprehensive and exhaustive series of investigations no such influence could be found at the works and it is believed that the treatment process and associated assets were operating adequately. There have been no failures since.

Clarifier at Hampton Loade Treatment Works

Contacting Us

Some of our customers request additional and more detailed information on the quality of the water supplied to their homes. Customers who require such information may wish to visit our website at **www.south-staffs-water.co.uk** where a more comprehensive breakdown of the water supplied to your home or business can be downloaded.

Alternatively additional information can be obtained from the Water Quality Department at our head offices in Walsall at the following address;

South Staffs Water
Green Lane
Walsall
WS2 7PD

Or via phone on our free Customer Helpline;

Customer Helpline – 0800 389 10 11

Customers who may have a problem with, or are concerned about, the quality of their water supply should contact the Company via the Helpline to ensure that their query is dealt with as quickly as possible.

Appendix 1

Annual Water Quality Report (Regulation 36)

Company Information	
Number of Water Treatment Works	22
Number of Supply Points	19
Number of Service Reservoirs	36
Number of Water Supply Zones	19
Total Number of samples taken	70,072

Water Treatment Works					
Number of samples taken from Water Treatment Works	32,277				
Schedule 1 Parameters					
	Number of samples	Number of samples greater than PCV	% greater than PCV	Number of samples greater than authorised departure	% greater than authorised departure
Total Coliforms (Res/PW)	4,611	5	0.11	-	-
Escherichia coli	4,611	2	0.04	-	-
Cryptosporidium	365	0	0	-	-
Number of Water Treatment works where samples exceeded PCV	5				
Percentage of Water Treatment works where samples exceeded PCV	22.72				
Number of Water Treatment works where samples exceeded authorised departure	N/A				
Percentage of Water Treatment works where samples exceeded Authorised departure	N/A				
Indicator Parameters					
	Number of samples	Number of samples greater than specification	% greater than specification		
Turbidity Ex-works	4612	0	0		
Nitrite (as NO2) Ex-works	4612	0	0		
3 day count,22 deg C	4610	0	0		
Total chlorine	4611	0	0		
2 day count,37 deg C	4610	0	0		
Number of Water Treatment Works where samples exceeded Specification	0				
Percentage of Water Treatment works where samples exceeded Specification	0				

Service Reservoirs

Number of samples taken from Service Reservoirs	8956

Schedule 1 Parameters

	Number of samples	Number of samples greater than PCV	% greater than PCV	Number of samples greater than authorised departure	% greater than authorised departure
Total Coliforms (Res/PW)	1,792	3	0.17	-	-
Escherichia coli	1,792	0	0	-	-

Number of Service Reservoirs where samples exceeded PCV	3
Percentage of Service Reservoirs where samples exceeded PCV	8.33
Number of Service Reservoirs where samples exceeded authorised departure	N/A
Percentage of Service Reservoirs where samples exceeded Authorised departure	N/A

Indicator Parameters

	Number of samples	Number of samples greater than specification	% greater than specification
3 day count,22 deg C	1,790	0	0
Total chlorine	1,792	0	0
2 day count,37 deg C	1,790	0	0

Number of Service Reservoirs where samples exceeded Specification	0
Percentage of Service Reservoirs where samples exceeded Specification	0

Supply Points

Number of samples taken from Supply Points	4172

Schedule 1 Parameters

	Number of samples	Number of samples greater than PCV	% greater than PCV	Number of samples greater than authorised departure	% greater than authorised departure
Cyanide	186	0	0	-	-
Mercury	186	0	0	-	-
Total pesticides	162	0	0	-	-
Carbon tetrachloride	186	0	0	-	-
Sum Tetra+Trichloroethene	186	0	0	-	-
1,2-dichloroethane	186	0	0	-	-
Benzene	186	0	0	-	-
Atrazine	152	0	0	-	-
Carbetamide	132	0	0	-	-
Chlorotoluron	132	0	0	-	-
Clopyralid	68	0	0	-	-
2,4-D	68	0	0	-	-

Schedule 1 Parameters (continued)					
	Number of samples	Number of samples greater than PCV	% greater than PCV	Number of samples greater than authorised departure	% greater than authorised departure
Dicamba	68	0	0	-	-
Dichlorprop	68	0	0	-	-
Diuron	132	0	0	-	-
Isoproturon	132	0	0	-	-
MCPP	68	0	0	-	-
MCPA	68	0	0	-	-
Propazine	152	0	0	-	-
Propyzamide	152	0	0	-	-
Simazine	152	0	0	-	-
Bromacil	152	0	0	-	-
Triclopyr	68	0	0	-	-
Metaldehyde	48	5	10.42		
Number of Supply Points where samples exceeded PCV			4		
Percentage of Supply Points where samples exceeded PCV			21.05		
Number of Service Reservoirs where samples exceeded authorised departure			N/A		
Percentage of Service Reservoirs where samples exceeded Authorised departure			N/A		
Indicator Parameters					
	Number of samples	Number of samples greater than specification	% greater than specification		
Gross alpha activity	107	18	16.82		
Gross beta activity	107	0	0		
Number of Supply Points where samples exceeded Specification			5		
Percentage of Supply Points where samples exceeded Specification			26.32		

Water Supply Zones

Number of samples taken from Zones	28,839

Schedule 1 Parameters

	Units	PCV	Number of samples	No. of samples greater than PCV	% greater than PCV	No. of samples greater than authorised departure	% greater than authorised departure	Minimum	Mean	Maximum
Colour	mg/l Pt/Co	20	1080	0	0	-	-	<1.5000	<1.5000	9.4
Turbidity	FTU	4	1080	0	0	-	-	<0.1100	<0.1100	1.31
Odour (quantitative)	Dil Number	1	1080	1	0.09	-	-	0	0.001	1
Taste (quantitative)	Dil Number	1	1081	0	0	-	-	0	0	0
Sodium	mg/l	150	190	0	0	-	-	9.6	26.3208	78
Nitrate (as NO3)	mg/l	50	190	0	0	-	-	<0.6000	26.454	49.6
Nitrite (as NO2)	mg/l	0.1	190	0	0	-	-	<0.0093	<0.0093	0.016
Nitrate/Nitrite Ratio	mg/l	1	190	0	0	-	-	0.01	0.8469	1
Aluminium	ug/l	200	1081	0	0	-	-	<8.0000	18.6901	194
Iron	ug/l	200	1080	0	0	-	-	<12.0000	<12.0000	181
Manganese	ug/l	50	1080	0	0	-	-	<2.1000	2.2001	35.7
Copper (New Reg Limit)	mg/l	2	190	0	0	-	-	<0.0030	0.0182	0.29
Fluoride	ug/l	1500	190	0	0	-	-	0.54	0.926	1.2
Arsenic (New Regs Limit)	ug/l	10	190	0	0	-	-	0.3	0.8509	3.5
Cadmium	ug/l	5	190	0	0	-	-	<0.0120	0.0685	0.36
Chromium	ug/l	50	190	0	0	-	-	<0.1200	0.629	1.6
Nickel (New Reg Limit)	ug/l	20	190	0	0	-	-	0.68	1.3869	8.9
Lead (New Reg Limit)	ug/l	25	190	0	0	-	-	<0.1800	0.9338	19.5
Antimony (New Reg Limit)	ug/l	5	190	0	0	-	-	<0.1700	0.2373	1.01
Selenium	ug/l	10	190	0	0	-	-	<0.3000	0.4048	3
Total PAH's (4 Det Total	ug/l	0.1	190	0	0	-	-	<0.0034	<0.0034	0.0034
Escherichia coli	No./100ml	0	3329	1	0.03	-	-	0	0.0007	2
Intestinal Enterococci	cfu/100ml	0	190	0	0	-	-	0	0	0
Boron (New Reg Limit)	mg/l	1	190	0	0	-	-	<8.0000	<8.0000	4
Benzo(a)pyrene	ug/l	0.01	190	0	0	-	-	<0.0004	0.001	0.001
Trihalomethanes (total)	ug/l	100	189	0	0	-	-	<4.0000	30.2964	79.4
Bromate	ug/l	10	190	0	0	-	-	<1.1000	<1.1000	2.3

Number of Water Supply Zones where samples exceeded PCV	2
Percentage of Water Supply Zones where samples exceeded PCV	10.53
Number of Water Supply Zones where samples exceeded authorised departure	N/A
Percentage of Water Supply Zones where samples exceeded authorised departure	N/A

Indicator Parameters								
	Units	Specification	Number of samples	Number of samples greater than specification	% greater than specification	Minimum	Mean	Maximum
pH		9.5	1080	0	0	6.6	7.2588	8.4
Sulphate (as SO4)	mg/l	250	190	0	0	22	53.9284	146
Ammonium (as NH4)	mg/l	0.5	1080	0	0	<0.0100	<0.0100	0.07
Total organic carbon	mg/l	-	190	0	0	0.18	2.1013	5.07
Total coliforms	No./100ml	0	3329	10	0.30	0	0.0391	100
Clostridium perfringens	No./100ml	0	1080	2	0.18	0	0.002	1
3 day count,22 deg C	cfu/ml	-	1081	0	0	0	6.1265	300
Total chlorine	mg/l	-	3330	0	0	<0.0200	0.1815	11
Conductivity	uS/cm	1500	1080	0	0	161	469.5735	837
2 day count, 37 deg C	Cfu/ml	-	1081	0	0	0	3.8634	231
Chloride	mg/l	250	190	0	0	24.2	47.9016	105
Number of Water Supply Zones where samples exceeded Specification					8			
Percentage of Water Supply Zones where samples exceeded Specification					42			

Appendix 2

Water Quality Parameters		
The Water Quality Summary reports on all parameters which are routinely monitored to comply with the (Water Quality) Regulations 2000 (amended 2007.) The table below provides information on and the standards for these parameters.		
Microbiological standards for drinking water		
Parameter	**Information**	**Standard (PCV)**
Total Coliform bacteria	Coliforms are a group of organisms which provide a general and sensitive measure of water quality. They are widely found in soils, and their detection does not indicate a direct risk to public health.	0 per 100ml
Escherichia coli (E.coli) Enterococci	These bacteria are found in the gut of warm-blooded animals. Their presence in drinking water may indicate faecal contamination. They are readily killed by disinfection but the occasional detection in drinking water can occur.	0 per 100ml
Clostridium perfringens	Clostridia have a widespread distribution and the bacterium can produce spores which can persist in the environment for long periods of time.	0 per 100 ml
Colony Counts @ 37ºC and @ 22 ºC	These have no direct health significance but are used for monitoring trends to assess the microbiological quality of drinking water.	No abnormal change
Cryptosporidum	Cryptosporidum is a microscopic parasite, which can cause acute gastroenteritis. Any high-risk site determined by risk assessment, is continually monitored.	< 1 occyst per 10 litres
Chemical standards for drinking water		
Parameter	**Information**	**Standard (PCV)**
1,2 - dichloroethane (sum of 2) Tetrachloroethane and trichloroethane	These substances arise from industrial solvents, some source waters may exhibit trace amounts.	3.0 µg/l
Aluminium	Aluminium can occur naturally in some waters, and is used during treament processes as a coagulant to remove impurites.	200 µg/l
Ammonium	Ammonium can naturally occur in some water sources, and can be used as a treament chemical when chloramination is practised.	0.5 mg/l
Antimony	Antimony is very rarely found in water. Trace amounts may be indicative of the presence of brass tap fittings and solders.	5 µg/l
Arsenic	Arsenic can be found in very low levels after water has passed through various minerals in the rock strata.	10 µg/l
Benzene	Benzene is mainly used in the petrochemical industry, it can penetrate plastic water mains when petrol is spilled near-by.	1 µg/l

Chemical standards for drinking water (continued)		
Parameter	**Information**	**Standard (PCV)**
Benzo(a)pyrene	Benzo(a)pyrene belongs to a group of compounds called polycylic aromatic hydrocarbons (PAHs). Trace levels can be detected due to the breakdown of coaltar, which was used many years ago to prevent corrosion of iron mains.	0.01 µg/l
Boron	Boron can be found in very low levels after water has passed through various minerals in the rock strata.	1 mg/l
Bromate	Bromate is not usually present in drinking water, however it can be detected as a by-product of the disinfection process.	10 µg/l
Cadmium	Cadmium can be found in very low levels after water has passed through various minerals in the rock strata.	5 µg/l
Chloride	Chloride is not harmful to health and can be present after water has passed through various minerals in the rock strata.	250 mg/l
Chromium	Chromium is rarely found in drinking water.	50 µg/l
Colour	Some water sources exhibit a slight yellowish tinge due to its passing through natural organic matter, the limit is set for aesthetical reasons and colour can be removed by treatment.	20 mg/l Pt/Co
Conductivity	Conductivity is the measurement of mineral salts dissolved in the water.	2500 µS/cm at 20°C
Copper	Copper can cause a metallic taste, and is rarely found in the source water. Its presence is due to domestic plumbing (copper pipes and fittings).	2 mg/l
Cyanide	Cyanide is rarely found in drinking water.	50 µg/l
Fluoride	Some water sources contain natural levels of fluoride. However the local health authorites request water companies to dose fluoride to protect against tooth decay.	1.5 mg/l
Hydrogen Ion (pH)	pH is the measure of acidity or alkalinity of water (pH <7.0 is acidic whereas pH >7.0 is alkaline.	6.5 - 10.00 pH
Iron	The standard for iron has been set for aesthetical reasons, the presence of iron is largley due to corrosion of iron water mains.	200 µg/l
Lead	Lead is rareley identified in source waters, but lead was formerley used as a plumbing pipe material. A significant number of older properties (built before 1970) still have lead pipes which are the responsibility of the homeowner. The company doses phosphate into water supplies to reduce lead levels as the customer's tap.	25 µg/l until 2013
Manganese	Manganese can occur naturally in many water sources but is readily removed by treament processes.	50 µg/l
Mercury	Mercury is rarely found in drinking water.	1µg/l

Chemical standards for drinking water (continued)		
Parameter	**Information**	**Standard (PCV)**
Nickel	Nickel is rarely found in drinking water and is normally asociated with nickel coatings on domestic fittings.	20 µg/l
Nitrate	The main source of nitrate is from intensive agriculture and the use of fertilisers. Nitrate can be removed by treament or the levels can be reduced by blending with other source waters.	50 mg/l
Nitrite	Nitrite can occur naturally at low levels, but can also be a by-product when chloramination is practised.	0.5mg/l at customer taps 0.1mg/l at water treatment works
Nitrate/Nitrite Ratio	The Nitrate/Nitrite Ratio is a measure of the combined concentrations of these compounds in drinking water. Concentration of nitrate divided by 50 + concentration of nitrite divided by 3.	< = 1
Pesticides	Pesticides are used by farmers, local authorites and gardners. Pesticides are removed at the treament works during filtration with the use of Granulated Activated Carbon (GAC).	Individual pesticides 0.1 µg/l. Aldrin, dieldrin, heptachlor, heptachlor epoxide 0.03 µg/l. Total of all pesticides detected 0.5 µgl.
Polycyclic aromatic hydrocarbons	Trace levels can be detected due to the breakdown of coaltar, which was used many years ago to prevent corrosion.	PAH (sum of 4) 0.1 µg/l
Radioactivity - Tritium	Tritum can be found in very low levels naturally after water has passed through various minerals in the rock strata. However elevated levels can suggest the presence of other artifcial radionuclides.	100 Bq/l
Radioactivity - Total Indicative Dose (TID)	This is a measure of radiation exposure through drinking water. Levels of radioactivity are moniroted by measuring gross alpha and gross beta activity.	0.1 mSv/year
Residual disinfection	Treated water is dosed with a small amount of residual disinfectant (chlorine) to ensure the microbiological quality is maintained from the source to the customer tap.	No standard
Selenium	Selenium can be found in very low levels after water has passed through various minerals in the rock strata.	10 µg/l
Sodium	Sodium is a naturally occuring mineral and not found in large quantatities. Domestic water softners can increase the content of sodium.	200 mg/l
Sulphate	Sulphate can be found in very low levels naturally after water has passed through various minerals in the rock strata.	250 mg/l
Taste and Odour	Taste and Odour analysis is used to measure the aesthetic quality of the water to detect if water has an unpleasesant taste or smell at 25°C	Dilution number of 3 at 25°C
Tetrachloromethane	A chlorinated solvent which arises from industrial processes.	3 µg/l

Chemical standards for drinking water (continued)		
Parameter	**Information**	**Standard (PCV)**
Total Organic Carbon (TOC)	This is a measure of the amount of organic material in the water. Monitoring for TOC ensures that the treatment process is working effectivley.	No abnormal change (mg/l)
Trihalomethanes (THMs)	THM's are formed when chlorine used for disinfection reacts with naturally occuring organic substances in water. The sum of the 4 compounds are: chloroform, bromoform, dibrochloromethane and bromodichloromethane	100 µg/l
Turbidity	Turbidity is a measure of the clarity of the drinking water. Elevated turbidity can sometimes occur following a burst main. Sometimes microscopic air bubbles can give the water supply a milky appearance, however after standing this will clear from the bottom upwards.	4 NTU at consumers taps 1 NTU at water treatment works