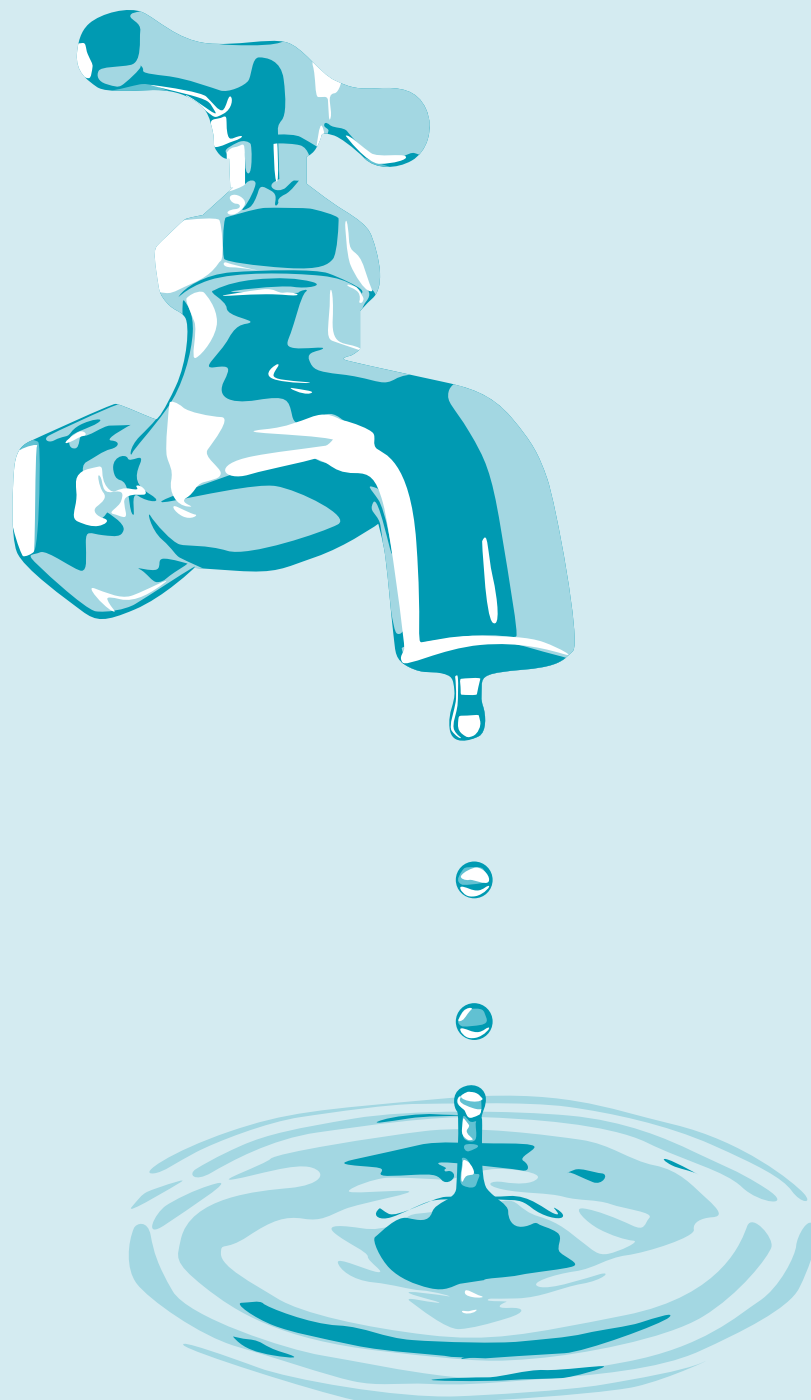


# Drinking water 2017

Quarter 2

April - June 2017

A report by the Chief Inspector of Drinking Water





Drinking water 2017  
Public water supplies for  
England and Wales

Quarter 2  
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## Foreword

*Drinking Water 2017* is the annual publication of the Chief Inspector of Drinking Water for England and Wales. It is published as a series of quarterly reports which cover public water supplies in England and Wales.

The report sets out to develop a source to tap approach in the supply of water, developing learning points from recent data, events and company strategies. It builds upon the strategic objective of DWI for wholesome and safe, clean drinking water to all consumers at all times.

This report describes the outcome of catchment risk audits and expands on the risk assessment data reported in the Chief Inspectors Report Q1 2016. Risk assessments are widely used, are endorsed by the World Health Organisation with respect to drinking water and sit within the Regulations. The concept is hazard identification, evaluation of risk and the elimination or control of risk. For an assessment to be effective it must be integrated in the ways of working within a company and be reviewed and updated to respond to changing risks. It is therefore disappointing to find after a series of audits that this basic ethos has not been adopted by all water companies in catchment even though all companies submitted data to provide such assurances.

The principle of risk assessment in water supply is source to tap and should be embedded in everyday use to identify developing risks such as those found in water treatment works, service reservoirs and networks. This report describes two major avoidable events that occurred primarily because the companies did not carry out appropriate water quality risk assessments during planning of works, did not update assessments on discovery of changes, did not have the competency or corporate memory to understand the risk of particular actions and continued to proceed in the face of risk to meet the pressures of maintaining a supply. The cost of these actions was to deliver water unfit for consumption to a large number of consumers for prolonged periods, widespread disruption and a significant financial cost not just to the companies but communities and businesses.

The Inspectorate delivers regulation by risk assessment of water companies through the analysis of data and evidence. The accumulation of that evidence identifies those companies who may be at risk of failure of their regulatory duties under the Act. Where this is identified, a structured transformation programme is put into place

with the company to ensure water quality is protected for the future. This report summarises the principles of this program for the benefit of consumers with the objective of avoiding incidents that cause widespread disruption.

## Drinking water sources and catchment management

### **Catchment Risk Audit Programme**

In March 2017, the Inspectorate began a series of audits to assess water companies' approaches to assessing risks associated with the raw water catchments supplying their treatment works. This follows on from the analysis of 691,233 lines of risk assessment data submitted by companies and subsequently published in the Chief Inspectors Report Q1 2016. In this report, companies identified that there were three main categories into which catchment risk assessment were classified: Target risk mitigation identified, verified and maintained; no mitigation in place but the control point was downstream such as in the treatment works; and no mitigation in place and none required.

The audits were carried out across seven companies and included both surface water and ground water catchments. The programme explored companies' approaches to assessing the risks, if these assessment were embedded in practice as the 2016 data set from companies indicated and the quality of information that the risk assessments were based upon.

For identified health risks, the programme considered whether these were appropriately mitigated or, where this could not be demonstrated, that companies had appropriate plans to fully investigate the risks in a timely manner before confirming if any further action was necessary.

In summary, the audits resulted in 35 recommendations to address or prevent regulatory breaches and additional enforcement action has been taken to remedy more significant deficiencies.

### **Catchment Risk Assessment**

All companies audited had implemented drinking water safety planning, which was broadly aligned to the World Health Organisation (WHO) principles on water safety plans; however, the approach differed markedly between companies.

Severn Trent Water and United Utilities had well-established teams carrying out catchment risk assessments and Severn Trent Water, in particular, was able to demonstrate good communication between catchment staff and site operational teams. United Utilities had also established an array of relationships with external stakeholders, including tenant farmers, the local rivers trust, the Environment Agency and Natural England. United Utilities also considered land use in the catchment to assess the well-established risk of pesticide exceedances at Wayoh works.

Wessex Water carry out surface water catchment management process on a similar basis.

Severn Trent Water had established checklists for evaluating risks within source protection zones around groundwater sites and the Inspectorate welcomed that new and emerging hazards could be captured at any time by use of a mobile phone app where the hazard is registered with any accompanying photographs, and a record made in a controlled manner rather than waiting for a review. Appropriate mitigation is then assessed and implemented according to a documented procedure with a sign-off process.

By contrast, Southern Water had made very little progress with assessing catchment risks and was unable to demonstrate satisfactory links to the company's drinking water safety plan. The company could not demonstrate any work on assessing catchment risks prior to autumn 2016 and the current scope was narrowly focused and largely subcontracted to a third party to carry out on its behalf. The company have therefore completely failed to achieve the objective or benefit of risk assessment methodology by integrating it with routine operations.

The risks from surface water to Bristol Water's Chelvey Well were recognised by the company, but it could not be demonstrated that they were understood in detail as much of the knowledge has been lost over time. It is important that companies keep up-to-date records of their sites and the associated risks. This will present companies with the opportunity to mitigate risks, ensure regulatory compliance and protect public health. Subsequently Bristol Water has let a contract to survey the site and gain more information on the potential risks.

### **Drinking Water Safety Planning**

The audits considered wider drinking water safety planning processes. Again there was contrasting performance. At Wessex Water, the safety plans were routinely reviewed on a regular basis and the process consisted of a desktop review, site meeting and subsequent review meeting.

Thames Water were able to demonstrate that they had a good process for identifying risks as part of their drinking water safety planning process, but deficiencies were found with the evidence provided to establish a number of risks associated with Datchet/Eton works, nor could it establish appropriate control measures. There were inconsistencies with a number of risks of a potentially serious nature under investigation by the company that had been categorised in its submissions to the Inspectorate as low risk, Category A, (Target risk mitigation received, verified and maintained). From discussions with site operators and managers, it was established



that there was a divide between the operators understanding of the safety plan and those of the drinking water safety planning team. It is a fundamental requirement of safety plans and all companies should ensure that operators and drinking water safety planners have clear lines of communication such that changing risks can be identified and addressed as they occur.

The audits established that insufficient resource was being applied to drinking water safety planning by Southern Water, partly due to short term recruitment issues. Resources were insufficient to carry out timely risk reviews following water quality events. Water quality risks arising from the company's failure mode, effects and criticality analysis (FMECA) process had not been captured in drinking water safety plans. Deficiencies were also identified with recording changes to the company's risk register.

The Inspectorate identified a number of risks at Southern Water's Burpham works including the risk of raw water bypassing the treatment process, which the company has now addressed. There were also risks to the disinfection process and the Inspectorate took enforcement action to ensure the company addressed these risks.

Bristol Water's safety plan methodology requires a review to be carried out following material changes to assets, following failures or standards or reportable events. This led to an approximately nine year gap between audits of Chelvey Well, the most recent of which was four days before the Inspectorate's audit. The Inspectorate does not consider this demonstrates a regular review of the risk assessment.

### **Groundwater Sites**

A number of site specific risks were identified including a potential risk of raw water being able to bypass the treatment process at Southern Water's Burpham works, with the only mitigation a hand written note on the cap to a single valve. The company were unable to demonstrate that action was being taken to positively address this issue. It was also identified that the contact main at site runs only part-full, presenting an ongoing contamination risk via the associated air-valves.

The site plans and records for Bristol Water's Chelvey Well were poor with uncertainty around the ground conditions, interconnectivity of source waters and potential surface ingress. The company are now taking actions to address these issues.

Severn Trent Water completed a study into selenium removal by the existing works processes in 2016, which demonstrated that this was not effective in addressing this emerging issue. However, at the time of the audit it had not taken steps to investigate alternative measures to mitigate the risk.

## Surface Water Sites

United Utilities had in place several control measures to address pesticide risks including short analytical turnaround times, permanent powdered activated carbon (PAC) dosing during the pesticide risk season, redundancy at the works to increase PAC contact times and, at the time of the audit, were in the process of upgrading the PAC dosing rig. However, these measures were not sufficient to prevent a breach of the regulatory limit for MCPA occurring after the audit of Wayoh works.

Wessex Water have identified unmitigated risks associated with *Cryptosporidium* in the Ashford catchment. This risk had been known since at least 2013. Delays in assessing and addressing identified risks was a common theme detected as part of this audit programme.

The Inspectorate reminds companies that identifying risks is merely the first stage in the process for protecting public health and it is incumbent upon water suppliers to address the identified risks in a proactive, robust and timely manner which is the purpose of risk assessment methodology.

## Water quality at treatment works

During the second quarter of 2017, the Inspectorate continued assessing the compliance data supplied by companies.

### Review of compliance – microbiological failures at treatment works

**Table 1: Q2: 2017 – Microbiological tests**

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

Parameter	Total Number of tests	Number of tests not meeting the standard
<b>Water leaving water treatment works</b>		
<i>E.coli</i>	39,477	0
Coliform bacteria	39,477	7

During Q2 2017, there were no *E.coli* detections and seven detections of coliforms at treatment works in England (ANH 1, NNE 1, SEW 1, SRN 1, SWT 1, TMS 1, YKS 1). In three cases, the investigation did not identify a cause but forward actions included moving to larger volume sampling for coliforms. In two cases, structural issues were identified, including poor condition of hatches and a crack in the external wall of a contact tank. Following one failure, animal matter was identified in the rapid gravity filter, but the company's investigation did not attribute the cause to this finding. A further failure was attributed, by the company, to the poor condition of the sampler's van although there was no evidence that other samples were contaminated through this proposed route.

## Water quality at service reservoirs and in distribution

### Assessment of compliance

In Q2 2017, there were no detections of *E.coli* at service reservoirs but there were 20 coliform detections (AFW 1, BRL 1, DWR 1, SEW 1, SRN 2, SVT 7, SWT 1, UUT 1, WSX 2, YKS 3).

On investigation, three reservoirs had risk of ingress. One of which was a hole in a hatch cover where a cable entered which had allowed ants to build a nest below the cover. The nest was removed and the hole sealed. In another reservoir, ingress was identified into both tanks and in the third, a hatch was mended.

Problems were also identified with sample kiosks. While investigations did not categorically identify the cause, one kiosk had a long sample line run, and in another case, the sampling facilities caused splashback at some flow rates.

One failure arose in a sample that was taken as a dip sample from the wrong cell resulting in a failure to obtain a representative sample in breach of regulation 16 (2)(a). The company have updated their procedures to prevent a recurrence.

In three further instances, investigations found that chlorine dosing rigs had failed and in one of these, manual chlorine dosing had been carried out by the company. Companies are reminded that risk assessment and mitigation of risks must be proactive to be successful in ensuring continued structural integrity and continued operation of any equipment used to maintain the quality of water. Reactive measures are clearly too late to ensure public health or maintain the water supply to the high standards expected by consumers as well as potentially interfering with root cause analysis or immediate risk identification. Where no cause was identified, three reservoirs were put on enhanced monitoring and two scheduled for inspection.

**Table 2 : Q1 – Microbiological tests**

Parameter	Total Number of tests	Number of tests not meeting the standard
<b>Water leaving service reservoirs</b>		
<i>E.coli</i>	51,904	0
Coliform bacteria	51,904	20

In Q2, the Inspectorate commenced a prosecution in relation to an event that led to discoloured and unusual tasting water from 29 October to 2 November 2015.

The event arose from work carried out to facilitate the development of a Lidl depot in Nursling, Southampton. Southern Water were asked to divert a 12 and a 24 inch diameter main around the site. To minimise the risk of discoloured water in the area served, modelling was carried out in advance and identified a five hour window between 23:30 and 04:30 for the work to take place.

A trial shut down during July 2015 took three hours to drain the 24 inch main. Exposed pipework and fittings near a thrust block in the excavation were not in accordance with records or drawings. As a result, the design was amended and approved by Southern Water Operations to save time during the abandonment operation. No re-modelling was conducted to assess the impact on water quality of this change. Agreed procedures and change control processes were not followed, but the safe control of operations procedures were signed off without any re-evaluation of the risk. It was assumed there would be no change to the risk.

On 29 October the work was completed on the 24 inch main, which was cut, capped and recharged. At 04:56 the first 'no water' call was received. The main had burst causing severe flooding to Brown Hill Way, a dual carriageway near the M27, requiring blue light services to close this major road into Southampton during rush hour.



**Figure 3: Significant flooding on Brownhill Way, an arterial route from the M27 to Southampton city centre.**

The post incident review concluded the 24 inch main pulled apart at an unrestrained and un-recorded lead run spigot/socket joint, under the pressure of recharging after capping on 29 October. The inaccurate mains records had resulted in the risk model being in error and the mitigation was ineffective in preventing the event. The abandonment operation failed catastrophically as a result.

### **Customer reaction**

The event caused significant distress to consumers and 224 discoloured water calls were received over the next three days across a wide geographic area (20 square kilometres). A local dental practitioner called the company when they received discoloured water. This was a problem because dentists must wash their hands between tending patients as good hygiene practice. The water looked rusty and tasted metallic. Southern Water advised “the water was safe to drink”, but it tasted so bad they could not drink it. They decided to use bottled water for hand washing. The quality of the water stopped a reverse osmosis machine, used for clinical purposes, from working. It was disabled for a week until an engineer could repair it and so they had to use bottled water to feed it. The practice relies on a supply of safe clean water and this event was very inconvenient. They were not happy to be told the water was safe to drink and said they have lost confidence with Southern water as a result of this event. They were not offered any bottled water or an alternative supply.

Water samples taken by the company indicated that water supplied was unwholesome due to the presence of iron, manganese, turbidity and coliforms. Consumers rejected water on aesthetic grounds and thus water was unfit for human consumption in breach of Section 70 of the Water Industry Act. In addition, hoses used to provide an alternative supply were not approved under Regulation 31.

The Inspectorate’s concluded that this was an avoidable event that occurred primarily because the company did not follow the preventative measures highlighted in its own procedures for procurement of materials in contact with potable water, construction site management, asset record keeping, asset design modifications; and water quality risk assessment during planning of the works.

The company failed to follow its own procedures designed to mitigate risk and to secure an appropriate response to observations arising during execution of the work.

The company did not understand and report upon the root cause of this event with certainty for 10 months. Critically, the company did not warn customers in advance about the planned work.

The company failed in their duty to ensure that all those who acted on their behalf, including contractors and legal advisers fully understood the regulatory duties of a water undertaker. In addition, the company did not notify stakeholders e.g., health protection teams and local councils in accordance with regulations and critically, had failed to learn lessons from previous events of a similar nature.

The company pleaded guilty to the supply of water unfit for human consumption in contravention of section 70 of the Water Industry Act and also for an offence under Regulation 31(4)b at Southampton Magistrate's court. The court ordered the company be fined £480,000 and the company agreed to pay the prosecutions costs.

Additionally, during Q2 2017, United Utilities pleaded guilty to charges brought by the Inspectorate in relation to the Franklaw event, the circumstances and outcome of which are described below.

On 6 August 2015, 712,000 consumers resident in North Lancashire were advised by their water company, United Utilities, to boil their tap water before using it for drinking and food preparation. This was in response to the detection of the protozoan parasite, *Cryptosporidium*, in water supplied from Franklaw treatment works, which was the sole source of supply to the affected consumers. The area covered by this advice included the major towns of Blackpool and Preston.

The company became aware of the highly unusual presence of *Cryptosporidium* in Franklaw work's final water on 5 August 2015. The treatment works was taken out of supply later that day for planned maintenance, unconnected with this detection. The second positive result was reported to the company during the morning of 6 August. Two consecutive results of oocysts at the concentrations detected was very unusual for Franklaw works and indicative of a potential risk to public health. The company continued with its plans to return the works to supply in the knowledge of the presence of *Cryptosporidium* and before issuing the advice to consumers to boil their tap water. Not to do so would have resulted in the loss of supply because quantities of treated water stored in the network were becoming low.

The event developed into a major water supply emergency. United Utilities complied with its duties as a category 2 responder under the Civil Contingencies Act and contacted the Lancashire Constabulary who mobilised the Lancashire Resilience Forum and established a multi-agency Strategic Coordination Group (SCG) to manage the incident. Other multiagency teams reporting to the SCG were established to deal with specific activities. Public Health England (PHE), the National *Cryptosporidium* Reference Unit, local authorities in Lancashire, Defra and

Cabinet Office were all involved, and represented on the various incident teams, as appropriate to those organisations' responsibilities and duties.

The advice to boil was in place for up to a month for some consumers, and caused significant concern to the consumers and businesses affected. The company was unable to identify the source of the contamination early on and species of *Cryptosporidium* known to be pathogenic to humans were subsequently found in the supply system. Without being able to rectify the root cause of the contamination, there was a risk that the company would have to keep the boil water advice in place for an indefinite period.

The company decided to install ultra violet disinfection at most of the service reservoirs in the Franklaw supply system which would ensure that *Cryptosporidium* present in the system would be rendered harmless. This was a major task for the company, involving significant financial outlay with procurement and engineering challenges, and completing the work in less than four weeks was a commendable achievement. As the work progressed, and contaminated water was removed from the distribution network, the boil advice was lifted in phases, until 6 September when it was lifted for all consumers.

The company's investigations into the cause of the contamination continued long after the boil advice was lifted. A definitive cause was not established, but in December 2015 the company determined that the most likely cause was direct contamination of treated water stored in Barnacre service reservoir – one of the major reservoirs in the Franklaw system. Immediately before the first positive *Cryptosporidium* result on 4 August 2015, the company had used water from Barnacre reservoir to supply the service water system at Franklaw works. Service water is used to make up treatment chemicals and provides motive water for chlorine dosing. This, crucially, meant that contaminated water was introduced into the treatment process at Franklaw after the treatment stages that are important for removal of *Cryptosporidium*.

The Inspectorate concluded that the incident was caused by a number of significant failings in the operation of Franklaw works and inadequate risk assessment of major operational changes that took place at Franklaw immediately before *Cryptosporidium* was detected in the supply. The Inspectorate used its powers of enforcement to ensure that the company implemented appropriate remedial actions at Franklaw and at other water supply sites operated by the company.

Public Health England confirmed that there were no identified cases of cryptosporidiosis in the community that were likely to be associated with the water supply.



The event highlighted some important lessons for United Utilities and the water industry as a whole in England and Wales. In particular water suppliers must have resilience built into supply systems where the supply to a large population of consumers has no alternative supply arrangements. This may be by connectivity, redundancy of assets or robust protection systems to ensure that continuous supplies of wholesome water can be maintained.

Water suppliers also need to ensure that emergency contingency plans are appropriate for the size of their supply systems, for example that restrictive advice to consumers can be disseminated quickly and effectively to the affected population. Plans for rezoning supply areas, providing alternative supplies such as bottled water and water in tankers and bowsers, and obtaining mutual aid, also need to be ready for mobilisation within a short space of time to minimise the impact on consumers.

The company pleaded guilty to supplying water unfit for human consumption at Preston Magistrates' Court on 19 July 2017. The Honorary Recorder for Preston, Judge Mark Brown, concluded at the sentencing hearing on 10 October 2017, that the event had a major impact on the day to day consumption of water in Lancashire causing widespread inconvenience and anxiety. Although there was not an outbreak, there was significant disruption and inconvenience to members of the public. Contaminated water should never have been introduced into Franklaw. A proper risk assessment should have taken place at Franklaw. There was also a failure to carry out a risk assessment at Barnacre service reservoir, which was especially notable given the risks associated with its structural defects and situation in the wider environment. It would have been an elementary precaution to undertake risk assessments before the operational changes were implemented at Franklaw.

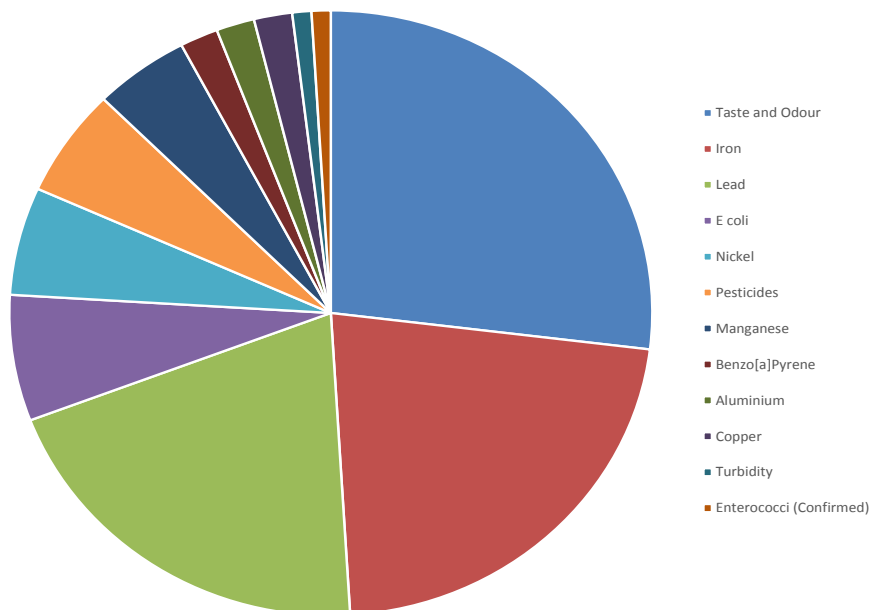
The Inspectorate expects companies to be alert to the scenario of *Cryptosporidium* entering the supply system after treatment and ensure that structures in the distribution network are protected from the entry of contamination from the wider environment.

## Water quality at consumers' taps

Most samples taken to assess regulatory compliance are taken from consumers' taps, and testing takes place for 51 parameters that have numerical standards. Sampling frequencies are determined by the size of the population in the water supply zone. The vast majority of samples taken complied fully with regulatory requirements. From the samples taken to demonstrate compliance with a Directive or national standards, there were a total of 106 failures for 14 parameters in Q2 2017. For microbiological parameters, seven samples contained *E.coli* and one contained Enterococci. With regard to chemical parameters, the most prevalent detections were for taste and odour, iron, lead, nickel pesticides and manganese which together accounted for 96 failures (92% of the total).

Looking at the 106 failures in more detail, Figure 4 shows the proportion of failures for the 14 parameters.

**Figure 4: Directive and national parameters failing in Q2 2017 – percentage of the 106 failures recorded at taps**



A review of the circumstances of the failures for taste and odour, iron, lead and pesticides showed the following :

- Taste and odour – Of the 28 failures, the most common cause of taste/odour was black alkathene pipe imparting a woody/pencil taste or odour. Five failures were attributed to low turnover in mains or long service pipes. Where mains were implicated, turnover was

increased. Of the failures arising from arrangements in individual properties, five arose from water fittings contraventions, and additionally, three failures were caused by interconnections between boilers, or a water softener and the pipework to taps used for drinking water. In two cases, geosmin was identified which imparts a musty/earthy taste or odour to water. In one case (Southern Water), the failure occurred at a time when PAC dosing was reduced by two-thirds due to a problem with the carbon silo. Changing a process which is in place to mitigate a risk without an appropriate proactive solution identified through a risk assessment is ignoring the wish of those whom the company supplies to receive water which is acceptable for taste. In the second case the company are responding by introducing a carbon dosing system.

- Iron. Of the 23 failures, two occurred in zones covered by legal instruments where the company is carrying out work to rectify the problem or investigate in order to specify an appropriate solution. Of the remaining failures, four were attributed to localised deposits which were remedied by flushing and the use of trickle caps. In one case, the cause was identified as a closed but passing valve that had allowed the build-up of sediment. The company wrongly thought this valve was open due to incorrect company records. The inspectorate is critical that it took 24 days from identifying the problem to repair and reopen the valve. In another instance a sampler for Severn Trent Water noted discoloured water at the time of sampling however the company took no proactive action to investigate the circumstances, a missed opportunity for the company to proactively avoid discoloured water. Subsequent later investigation found there had been work on distribution around the time of sampling and the company have amended their procedures. Additionally, a further failure was attributed to third party use of a hydrant. The illegal use of hydrants continues to be a challenge for companies and it is expected that where possible, if water is taken from a hydrant illegally, companies should prosecute. Severn Trent Water successfully prosecuted a company in April 2018 for the illegal use of a hydrant in the Warwickshire area in August 2017. The company was ordered to pay a total of £3,995.65, made up a £1,000 fine, £2,895.65 in costs and a £100 victim surcharge. Severn Trent stated that *'Our customers pay for their water, so companies should too. Not only are they not paying for it, they are also putting water supplies at risk of being murky or not being there at all. These companies are not trained to use our hydrants properly, which also puts people at risk in emergencies, as the fire and rescue service relies on our hydrants and if they're broken, it could have serious consequences'*.



**Figure 5: Unlicensed, ill-fitting and unhygienic use of hydrants is not only theft of water but puts consumers at risk from discolouration and contamination. The company was successfully prosecuted by Severn Trent Water**

- Lead. Of the 21 lead failures, six were in zones covered by the companies' legal instruments for lead. Ten failures (AFW 1, BRL 1, NNE 1, SVT 1, TMS 5, UUT 1) resulted in communications pipes being replaced and advice provided to consumers where lead was identified on the consumer's side. The replacement of communications pipes without replacing the supply pipe on the customer side is unlikely to remediate the risk of lead and would require advice to consumers to flush before use to mitigate the risk. Should there be a drought or water resource stress or even a metered water supply, then conflicting priorities might cause consumers to forgo this advice. Two failures were attributed to lead solder use in the properties concerned. The availability of leaded solder continues to result in a hazard to consumers and companies together with the Water Regulation Advisory Service would be well placed to ensure information and training is available to all those who engage in plumbing activities. As a further example of the benefit of this strategy, two further failures occurred in public buildings where recent plumbing activity had been taking place. In one case (Southern Water), a girl's school, the service pipe could

not be found and so it could not be determined if it was lead. Repeat samples were satisfactory and advice was provided to have the pipework checked and to report back to the company. In the second, the consumer reported that recent plumbing had been carried out and so it was believed that no lead was present. The company found no lead on its side but did identify lead at the customer boundary. This was replaced by plastic piping however subsequent samples failed. It was then proposed that the water tank may have contained residual water with a higher lead content so advice was given flush the tank but further samples still exceeded 10µg/l of lead. Further advice was given to fully drain the tank and the consumer advised to flush taps. The company provided no evidence that a water fittings inspection had been carried out. In a more unusual situation, a lead failure in a village property led to investigations by South West Water that identified a possibility of further properties being at risk from lead pipework and the company sent letters to all properties in the village. This action is to be commended as it delivers proactive information to consumers for the purpose of public health, a core value of delivering safe and wholesome water.

- Nickel. Of the six failures, all were attributed to plumbing fittings within individual properties. Three of these failures were in properties where the plumbing was new or water was standing for some time (show home, newly built building and one building which was infrequently used). Advice on flushing was provided. Despite the usual cause of nickel failures being domestic fittings, companies are expected to carry out appropriate fittings inspection and the Inspectorate is critical of one company which did not conduct an inspection when the failure occurred.
- Pesticides. Six failures occurred, three detections of metaldehyde (April and June) in one zone supplied by Affinity Water. This zone is covered by a legal instrument requiring the company to carry out a range of catchment management activities to reduce metaldehyde input at source. One detection of glyphosate was from a sample taken from a utility room sink in a farm where glyphosate was used. Two detections of MCPA were reported. One was thought to be a point source pollution event and the company have increased raw water monitoring. The mitigation is for the abstraction to be stopped until levels drop. The second detection was subject to a good catchment investigation which identified the only possible source to be a piece of forested land however the Forestry Commission confirmed that MCPA was not used on this land. The company has put in temporary PAC dosing and has carried out additional catchment sampling.

## Transformation programmes and company performance

A transformation programme is a collaborative agreement which a company voluntarily enters into alongside the Drinking Water Inspectorate. The objective is to enable a company to structure its priorities to deliver wholesome drinking water which is acceptable to all. Transformation programmes arise following evidence of failure to respond adequately or in a timely enough manner, to regulatory actions primarily as recommendations arising from audits, events or other assessments and usually indicate an increase of risk to regulatory compliance.

An increasing risk often manifests as a downward trend in performance occurring over months or years. It is often characterised by an increased number of avoidable events, statutory compliance monitoring failures, repeated recommendations on a similar theme, staffing issues, poor data returns or failure to meet codes of practice or requirements of Directions. The resultant outcome is often a loss of confidence in the company, its' management, policy, procedures or culture leading to a general reduction in the high quality of output which is typical of the majority of the UK water industry.

Where there is evidence of an increasing risk, the Inspectorate will engage with the company to instigate a transformation programme although a company may proactively identify a changing risk and initiate the process itself.

Each programme is bespoke but generally results in a series of legal instruments intended to protect public health now and in the future. The legal instruments, which make up the framework, upon which the programme is based, are written using the powers of the Water Industry Act 1991 and ensure the transformation programme is delivered with appropriate pace and commitment. The schemes may be equally site specific or companywide schemes and often require investigatory actions to evidence actions which may be hard outcomes such as asset delivery, or softer outcomes such as management and staff culture. The Inspectorate's objective is to engage with all levels of the company with frequent liaison and consultation throughout the programme including a series of milestone report dates to ensure progress is measured.

Currently, there are four companies in transformation programmes at various stages. In all cases, these have been initiated as a result of increased risk. The first programme was initiated for Severn Trent Water following a series of significant events in 2011/12 for which the company was prosecuted; the programme was put into place as a reactive measure. Whilst not yet complete, the company has progressed well through this

programme and evidence indicates a measurable improvement in performance, despite a few setbacks. In the summer of 2015, United Utilities were notified of a significant increasing risk, soon after which the company suffered a major event involving the Franklaw works, described earlier in the report. The Inspectorate continues to work closely with the company to ensure delivery of a mid to long-term outcome for the benefit of consumers. Whilst the company are making forward steps, tangible improvement is likely to take a number of years.



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