

Drinking water 2018

Quarter 1

January - March 2018

A report by the Chief Inspector of Drinking Water



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Drinking water 2018
Public water supplies for
England and Wales

Quarter 1
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Foreword

Drinking water 2018 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, audits and company strategies. It builds upon the strategic objective of DWI for wholesome and safe, clean drinking water to all consumers at all times.

In the Chief Inspectors Report 2017 Q3 an increase in coliforms in reservoirs was highlighted. Company investigations identified a number of reasons for the failures where a cause was found, including ingress but critically, a significant number remained without a known cause. Companies were advised to take note of the risks presented by asset deterioration and integrity loss. Lack of reservoir maintenance and associated risk has been raised a number of times since 1988. It was reported that Affinity Water, Thames Water and Yorkshire Water accounted for half of the total coliform failures between them at the time of the report.

In this first quarter of my report in 2018 I am able to report, in detail, the outcome of a series of audits undertaken by my Inspectors focussing on service reservoirs. I am pleased to note that out of the three companies highlighted Yorkshire Water have introduced a new procedure that scores each service reservoir dependent on a number of risk criteria. The new scoring system allows the company to track the impact of various risks elements of the assessment. This process provides an opportunity to set internal inspection frequencies such that the risk of ingress is reduced. This approach adopts modern risk methodology which other companies could learn from. Equally, site fencing and vermin control were observed to be well managed at all Yorkshire Water reservoirs visited and this engenders a level of confidence from the pride a company takes in their sites.

I am pleased to note innovation in monitoring with Northumbrian Water exploring the use of flow cytometry to identify high risk sites, a methodology which is being adopted by a number of companies for predictive mitigation. Furthermore, Northumbrian Water's internal inspection programme is prioritised using a tendency to fail analysis which includes asset structure and age, turn over, and chlorine residual. The maximum inspection target interval is five years, with higher risk sites on a three year programme, an excellent example of modern risk-based strategy.

Unfortunately such good practice is not adopted throughout the industry and one company again stands out as being below standard. This company does not have a risk-based approach to setting internal inspection frequency and instead sets a blanket ten-year frequency, All but one of the Affinity Water service reservoir sites visited appeared to have significant signs of vermin activity. Animal holes ranged from numerous small holes on the top of the service reservoirs to more substantial burrow holes in the banks to the service reservoirs. Furthermore the company does not conduct exercises to test the functionality of key valves to ensure they can be operated in emergency situations and the team conducting external inspections were not communicating with the site operations or water quality team personnel to address risk.

While for individual failures, it may be difficult to identify a specific cause in every case, wider inspection of a company reveals the evidence that repeated failures and poor performance are related to wider company strategy. If there is no adoption of best practice in response to risk, there is a greater likelihood of failures at assets.

This report explains the regulatory strategy of transformation programs. As reported previously by the Chief Inspector, the Inspectorate adopts an approach to regulation and enforcement that follows the key principles of better regulation to allow companies the opportunity to address breaches or potential breaches of the regulations before it results in enforcement action. The objective is to reposition the company for the strategic objective of providing good, clean, wholesome water. Transformation programmes have been put into place for those companies which have a higher likelihood of regulatory failure, however, a company may benefit from agreed enforcement around a particular single issue where underperformance is evident.

Finally the case of Sweetloves works, (UUT), was concluded in this quarter and has been included for wider learning. Both events associated with this works were the consequence of readily preventable failures in the supervision and operation of the treatment works. It is the expectation that other companies adopt practices which reduce the risk of a similar situation arising.

Water quality at treatment works

During the first quarter of 2018, the Inspectorate continued assessing the compliance data supplied by companies, including the reports of 299 compliance breaches.

Review of compliance – microbiological failures at treatment works

Table 1: Q1: 2018 – 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
Water leaving water treatment works		
<i>E.coli</i>	41,184	3
Coliform bacteria	41,183	13

There were three *E.coli* failures reported in the first quarter of 2018 (2 ANH, 1 SRN). 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, these additional tests all gave satisfactory results and there were no subsequent *E.coli* failures at any of the three sites.

Both Anglian Water failures occurred on the same day, but the company found no issue with the sampling or analysis that would explain the failures. At Glandford works, a groundwater source in Norfolk, the company removed the works from supply whilst investigations were ongoing. Some minor fittings infringements and a crack in the wall of a septic tank were found, but investigations were unable to determine a definitive cause for the failure, all samples taken in response were satisfactory. At Dalton Piercey works, near Hartlepool, the company also failed to find a root cause during investigations which included audits of some of the borehole sites, similarly all samples taken in response were satisfactory. The Inspectorate visited the site in May and observed some minor issues with the sample tap. Both works were operating within expected limits, however, the finding of *E.coli* must be considered serious particularly in the absence of a root cause. Ongoing surveillance of the

works should be a minimum response to demonstrate there is no recurrent problem.

The failure at Southern Water's Testwood works was ascribed to poor sampling facilities by the company. The sample tap was found to be dirty and on swabbing, contained black fibrous material. This is of particular concern as a recommendation was made that this should be addressed following a previous coliform failure in October 2017. The Inspectorate was minded to take enforcement action, however, the company were able to demonstrate that appropriate and timely steps were being taken to resolve the issue.

There is little excuse for the poor condition of sampling facilities as the ability to take a representative sample from treatment works has been a requirement of the Water Supply (Water Quality) Regulations since their inception. Companies are also reminded that more specific requirements for sampling at water treatment works were made as part of the Water Supply (Water Quality) Regulations 2016 amendments in June 2018. Microbiological samples must be taken and handled in accordance with European standard EN ISO 19458 entitled 'Water Quality – Sampling for microbiological analysis'. Further detail is given in regulation 9 (3) and in the Inspectorate's guidance on the regulations.

There were also 13 coliform breaches at works in the first quarter (SRN 3, ANH 2, SVT 2, CHO 1, ESK 1, PRT 1, SEW 1, SWT 1, YKS 1). The absence of coliforms remains an effective determination of efficacy and integrity at treatment works. Company investigations into the failures were unable to identify a root cause for four of these failures despite satisfactory investigations.

The assessing Inspector identified a notable variability in the chlorine residual associated with the breach at Portsmouth Water's Lovedean works although this had not been highlighted within the company's report. The Inspectorate made a recommendation aimed at improving the control of the disinfection process at the works and is critical that the company omitted a fundamental element of works control. A notice is already in place to address issues associated with ingress at Severn Trent Water's Strensham works, which is undergoing significant refurbishment including repairs to the integrity of contact tanks. Following a coliform breach in February, the Inspectorate considered that the company were adhering to the requirements of the notice.

The Inspectorate took enforcement action to address shortcomings in the treatment process at Northumbrian Water's Fowberry works, following a turbidity failure in February. This included the implementation of failsafe shutdown systems and an effective run-to-waste facility to prevent the supply of improperly treated water. Northumbrian Water took action to fast-

track the installation of a new filtration stage at North Dalton works following a turbidity failure on this site in February.

Sweetloves Event

During the first quarter of 2018, United Utilities pleaded guilty to two breaches of regulation 26(1) in failing to adequately disinfect water at Sweetloves water treatment works near Bolton, Lancashire. Inadequately disinfected water was supplied by United Utilities from 31 March 2015 to 3 April 2015 and again between 19 and 22 July 2015. During the second event, 79,000 consumers in Bolton were advised to boil their tap water before consumption for three days.

There was no evidence of actual harm caused but there was an increased risk to public health because of the potential presence of pathogenic micro-organisms in water supplied to consumers. Both events were the consequence of readily preventable failures in the supervision and operation of the treatment works. Aside from these events there were a series of other events at other works relating to inadequate disinfection.

In consideration of all the facts, the Chief Inspector decided that prosecution was in the public interest. The judge concluded that each event at Sweetloves works involved the combination of a number of factors which could only be described as a 'catalogue of errors', and that United Utilities' culpability was high. Nonetheless, there were a number of mitigating factors in the company's favour.

Both events arose from fundamentally the same root cause, the over addition of sodium hydroxide to the water being treated before the second stage filters due to failures in the sample pumps serving the pH meters at this location. The sample pump failures meant that the meters falsely recorded a reduced pH in the water being treated and, as a consequence, the system increased the input of sodium hydroxide into the water increasing its pH beyond that required for effective disinfection.

The offences committed by the company were, in part, attributable to the absence of procedures to prevent the forward flow of water into supply, in situations where there was a failure in preliminary treatment or disinfection. In addition, the company failed to properly implement its own procedures with regards the implementation of, and response to, alarms at critical control points in the water treatment process at Sweetloves works.

There was a striking similarity between the initial phase of the event in July and the event in April, which demonstrated that the company failed to

take adequate steps and learn appropriate lessons from the April event. The Inspectorate also found that inadequate staffing levels played a part in the initial response to the July event.

There are a number of themes derived from these events, which the Industry would do well to heed:

- All critical control points should be appropriately monitored, alarmed and suitably resourced to effect timely response;
- Maintenance regimes should be associated with an assurance system which ensures the procedures are followed;
- There is an expectation that companies learn and improve from reportable events;
- When treatment is inadequate, that the water is prevented from entering supply.

Water quality at service reservoirs and in distribution

Assessment of compliance

In Q1 2018, there were no *E.coli* failures at service reservoirs and eight coliform detections (AFW 2, SEW 2, ANH 1, ESK 1, TMS 1, and UUT 1).

Table 2 : Q1 – Microbiological tests

Parameter	Total Number of tests	Number of tests not meeting the standard
Water leaving service reservoirs		
<i>E.coli</i>	49,901	0
Coliform bacteria	49,901	8

Despite coliform detections in consecutive samples at Harefield 3 West reservoir in March, Affinity Water delayed removing the reservoir from service until April. The company's investigation concluded that the main cause was poor turnover and the reservoir remained isolated for the rest of 2018 pending network modifications. This response is particularly concerning since there have been five detections at Harefield East and West in the last eight months and this specific site failed twice in 2017 (Aug, Sept), and once each in 2013 and 2014 for the same reason with the same solution. The previous internal inspection on this site before 2018 was 2007 and it is clear there was no inspection based upon a rising risk

profile for this site. This is a critical failure in securing water quality and for which this company has been highlighted in the Chief Inspector's report of 2017. The Inspectorate will continue to monitor this company's activities in this area and the company was included in the service reservoir audit program detailed in the section *Service reservoir audit programme* with a below standard outcome.

Service reservoir audit programme

Service reservoirs and water towers are integral to water supply systems across England and Wales, providing a buffer against fluctuating consumer demand and increasing resilience in the water supply network. However, as these structures age there are risks to their integrity allowing for potential contamination.

In the first quarter of 2018, the Inspectorate carried out a series of audits of service reservoirs sometimes in challenging weather conditions during the 'beast from the east'.

Risk Assessment

Water companies should be carrying out regular risk assessments of their service reservoir and water tower sites. The risk assessments should consider all aspects of the site's operation that could lead to a deterioration in water quality. These risks include the condition of the structure; the environment within which it is located; weather, operational issues including turnover etc. Water companies should avoid an over reliance on generic assessments and ensure that regular assessments of risk are fed back into a review and prioritisation process such that appropriate mitigation can take place before consumers are affected.

The scope of South West Water's risk assessments for all service reservoirs reported to the Inspectorate was limited to coliforms, E.coli and plate counts. A number of risks were identified during audits that were not included, therefore the company is not applying an appropriate risk-based methodology. Contamination risks at Belliver reservoir will not be mitigated until the reservoir is abandoned in 2019; poor control of booster chlorination at Houndall reservoir and risks associated with poor turnover had not been addressed. The development of the company's new risk assessment database was delayed due to contractual and financial issues. This delay, combined with the above-mentioned risks that are not recorded in the company's regulation 28 reports, indicates that the company is in breach of regulation 27.

Deficiencies with Affinity Water's risk assessments (e.g. comments not updated, frequency of risk review) were highlighted to the company for review and resubmission. The company do not have a risk-based approach to setting internal inspection frequency and instead set a blanket ten year frequency unless a significant risk identifies a need to inspect sooner. This approach is not in-line with good practise as outlined in Principles of Water Supply Hygiene and not aligned with a Drinking Water Safety Plan Approach.

Conversely, Yorkshire Water have introduced a new procedure that scores each service reservoir dependent on a number of risk criteria. Consideration has been given to asset structure, condition grade, roof type, including over-burden, elevation and surrounding land usage. It applies current knowledge of risk issues and lessons from other high profile events. The new scoring system allows the company to track the impact of various risk elements of the assessment. This process provides an opportunity to set internal inspection frequencies such that the risk of ingress is reduced. This approach adopts modern risk methodology which other companies such as Affinity Water could learn from.

Adjacent Environment

It is good practice to consider water quality risks beyond the boundaries of service reservoirs to ensure that supplies are adequately protected.

Affinity Water's Buntingford service reservoir has arable land along one edge at higher elevation. The drainage ditches observed at the boundary were in good condition and directing surface water runoff away from the site.

Conversely, South West Water's Houndall reservoir is situated below a field containing horses. Inevitably there is manure in the field and there is a risk of surface water runoff into chambers on site and onto the reservoir roof. The risks had not been recorded in the site's drinking water safety plan risk assessment and the failure to identify risks beyond site boundaries appears common to many of the company's sites.



Figure 1: Horses in field above South West Water's Houndall Service Reservoir

Likewise there was a risk of surface water runoff from the entrance gate and the lane and field beyond, which are at a higher elevation than Wessex Water's Snowden Hill reservoir. The field appeared to be for grazing, however there were no animals present at the time of the audit. The risk of surface water runoff did not feature in the risk assessment for the site.

Recommendations were made for both Wessex Water and South West Water to review risk assessments for all service reservoirs.

There is a rural footpath used by dog walkers and others adjacent to Severn Trent's Highwood reservoir. The main building and hatch covers are adequately secured against malicious intrusion, but the site can easily be breached by fouling dogs. The Inspectorate suggested the company takes steps to prevent this, which the wire fencing does not. A large heap of manure was located next to the reservoir a few meters from the perimeter wall. Whilst this was outside of the compound and downhill of the site, there is a risk that faecal material is transferred into site by vehicles or pedestrians visiting the site. ***Water companies should work with local landowners to minimise contamination risks and these need to be properly considered and reported as part of water safety plans and regulation 28 reports.***

Northumbrian Water have a procedure to assess topographical and land use issues during planned site visits. However, treated water tank inspection reports, by the company's contractor failed to comment on adjacent land use for the Stoneygate Reservoir inspection despite this being a report requirement. ***The failure of companies to ensure their own procedures are followed is frequently identified by the Inspectorate at audits. Independent checks to confirm that the procedures are being followed as intended has been found to improve compliance and the Inspectorate would encourage companies to carry out a series of internal audits to ensure water quality protection measures are followed.***

On the positive side Northumbrian Water is exploring the use of flow cytometry to identify high risk sites, and this innovative approach will provide more evidence to support the tendency to fail analysis and inform inspection frequencies going forward. The Inspectorate encourages innovative solutions employing predictive analysis. The company's understanding of this methodology has been demonstrated to secure water quality for its' consumers. The wider adoption of this methodology is gathering pace with Severn Trent Water and United Utilities among others gathering data in support of evidence-based risk assessment.

Site Inspections

External

Inspections can identify a number of water quality risks including unwanted intruders and poor structural features leading to contamination risks.

The boundary fence at Thames Water's Sewardstone Green reservoir had been partially removed to allow building contractors access to the site. This presents an obvious security risk, which needed rectification.

At Wessex Water's Leigh Hills service reservoir there were several holes in a fence adjacent to a farm machinery building. There were also a number of trees encroaching upon the fence line and pushing it over in places.

There were a number of houses which backed onto the land adjacent to United Utilities' Pex Hill reservoir, it appeared that some of the local residents had used land within the grounds of the reservoir approximately 10m from the edge of the reservoir as a place for a bonfire. The company need to do more to prevent intruders using the site.



Figure 4: Bonfire site in the grounds of United Utilities Pex Hill SR

Evidence of intruders was also identified at United Utilities' Pale Heights service reservoir, which is located on a high point and a local beauty spot. An area of the roof was used for a barbecue. The company have since upgraded the site fencing to prevent unwanted intrusion. Poor fencing, graffiti and gorse growth on the embankment were seen at United Utilities Harrol Edge service reservoir where badgers and rabbits had also made scrapes in the bank.

South West Water's Belliver reservoir was waterlogged on the surface, indicating inadequate drainage. There is no membrane protection for the roof. There were a number of mature trees on the outskirts of the reservoir, the roots of which could pose a risk to the reservoir integrity. A disused leat, (artificial watercourse or aqueduct dug into the ground), adjacent to the reservoir was filled with water due to a blockage. The overflow pipework drains into this leat terminating in a flap valve surrounded by a cage to prevent vermin ingress. The water level in the leat was below the flap valve, however if the level were to rise further, the

overflow would become submerged and the flap valve may not be sufficient protection against contamination. No employee knew the location of the washout outfall. A helpful ex-employee would need to be asked. The Inspectorate recommended conducting a survey of service reservoir assets against any existing schematic diagrams to confirm the location of valves and to update records where there are gaps and carry out inspections to ensure that they remain in good order. The previous external inspection was in 2015, given the age of the asset and the difficulty in removing it from supply, this is too long.

Communication issues were identified at Affinity Water where it was evident that the team conducting external inspections and seeing through the subsequent works is not communicating with the site operations or water quality team personnel. These teams were not aware if risks from an external inspection of Jack's Hill service reservoir had been addressed. This is a particularly concerning circumstance since this reservoir failed the coliform standard three times in 2017 and was the only reservoir in England and Wales in 2017 not to meet the regulatory minimum of 95% of samples to be clear of coliforms in a 12 month period. This site received special mention in the Chief Inspector's report from 2017 and the company have fallen short of taking acceptable remedial action.

Communication between teams needed improvement to ensure identified risks are mitigated.



Figure 5: Rownhams Reservoir. Temporary Cover.

The roof of Southern Water's Rownhams Reservoir is in a vulnerable condition. Following the detection of ingress the company decided to install a temporary membrane over the grass. The temporary membrane was held down by sand bags. There was heavy rain the night before the audit, and water was pooling on top of the membrane. A small section was lifted to examine the soil condition, which was damp but not waterlogged. It is likely that the membrane has provided some protection from further ingress following heavy rain. Whilst the over membrane has provided some reduction in ingress, it has not prevented it. The risk to consumers was not adequately mitigated. The Inspectorate subsequently issued a notice to rectify the structural issues found at this site.

The Inspectorate considered the roof of Severn Trent's High Service Storage reservoir to be in extremely poor condition with extensive ponding, vegetation encroachment and exposed membrane. The year on which this protective roof membrane was installed appears to be unknown. In contrast, the roof of High Service was in good order with adequate drainage and protective fencing had recently been refurbished.

The fact that there was litter and a canister of some age observed during the audit of Rodbourne service reservoir suggests that site inspections are inadequate or at least do not include the removal of discarded items, all of which added to the general impression of neglect at this site. In addition the lighting in the main building was not working at the time of the audit and it was not clear as to how long this had been the case. The internal area of the building appeared run down, unclean, and generally in a state of neglect. Although these points present no specific risk to water quality in themselves, they do suggest that the site receives no regular care and attention as befitting a clean water restricted area. The sampling facilities are accessed via a short flight of stairs in the main building. With no lighting this presents a precarious route to a darkened platform, with little room for manoeuvrability for samplers to execute their duties.

Northumbrian Water's Ryhope reservoir is situated in the grounds of Ryhope Engine museum, and there is access by the public. The reservoir had standing water on the roof, due to snow melt. Risks from public access and poor drainage need to be considered and addressed.

United Utilities provided a copy of their reservoir flood testing process and guidance which is a current example of industry good practice and appeared robust. However, the procedure mentions the insertion of pumps into reservoirs which are currently going into supply, this procedure appears to pose risks to water quality. Suitable safeguards are needed to mitigate against the risk of contamination.

Site fencing and vermin control were observed to be well managed at all Yorkshire Water reservoirs visited. Good practice was also seen at

Thames Water where six monthly external inspections are undertaken by the supervising engineer for Thames Water's service reservoirs with a check on all key valves for satisfactory access and operation as set out in local documentation.

Internal

The Inspectorate expects companies to be carrying out internal inspections on a risk basis and there should be clear plans of how to remove each structure from supply to allow internal inspection whenever required and at the very least every ten years. Where sites are difficult to remove from supply, this risk should be incorporated within Drinking Water Safety Plans and appropriate steps should be taken to enable such sites to be removed from supply.

A number of Thames Water's reservoirs had not achieved man entry internal inspection within the last ten years. Likewise nine sites were identified by Wessex Water and 31 sites belonging to South West Water that had not been internally inspected within this period. This is poor practice and it is expected that all companies will have in place policies and procedures to comply with the Principles of Water Supply Hygiene.

Southern Water's Rownhams reservoir was last internally inspected in 1999. Since then the company has assessed the risk too great to take the reservoir out of supply. But the company had taken no steps to address this risk in the intervening years. It is inevitable that internal inspection and repair shall be required on all service reservoirs at some stage and this lack of forethought is negligent.

Affinity Water's Sibley service reservoir had never been formally inspected internally, but the company had constructed an additional reservoir on site to allow this to take place. There was a lack of evidence that remedial repairs at Jack's Hill (AFW) reservoir had been completed in accordance with the findings of the company's internal inspection report. The company are in the process of developing a new database to track close out of actions.

Belliver reservoir has not been taken out of supply for inspection and cleaning since 1985 due to a lack of a bypass at the reservoir. South West Water plan to abandon the site when the new Mayflower works goes into supply. The company were unable to provide any historic records of cleaning or inspection for Watercombe reservoir since 1950. The Inspectorate recommended that development of the plan to clean and inspect this reservoir be prioritised and implemented as soon as practically possible.

Northumbrian Water's internal inspection programme is prioritised using a 'tendency to fail' analysis which includes asset structure and age, turn over, and chlorine residual. The maximum inspection target interval is five years, with higher risk sites inspected on a three year programme.

Vermin Risks

All but one of the Affinity Water service reservoir sites visited appeared to have signs of significant vermin activity. Animal holes ranged from numerous small holes on the top of the service reservoirs to more substantial burrow holes in the banks to the service reservoirs. This was especially noticeable at Jack's Hill and Sibleys Old service reservoir. The external inspection reports for these sites highlighted the animal activity as an action to address. The Inspectorate concluded the company does not have robust control measures in place to address vermin activity and recommended the company takes steps to control vermin and ensures there is clear reporting, accountability and review of actions taken to ensure the objectives are achieved.



Figure 6: Jack's Hill SR – Vermin burrows into the embankment

Signs of burrowing were noted on the embankment of Thames Water's Cockfosters reservoir, although this did not appear to be causing any structural challenge. Mole activity was considered an issue at Northumbrian Water's Stoneygate service reservoir and Southern Water's Moorhill 3 service reservoir.

Site Operation and Turnover

Each Thames Water site visited had site-specific schematics available detailing mains, valves and drain points and a separate schematic showing sample lines. We were pleased to note the inclusion of a site specific operating manual available as well as a drain down procedure at each reservoir. Similar good practice was in place at Yorkshire Water's service reservoirs, where schematic diagrams were available to staff, to locate valves and pipework.

Affinity Water outlined their current programme of work to produce method statements for operation of service reservoirs in emergency situations and this work is welcomed. The company does not conduct exercises to test the functionality of key valves to ensure they can be operated in emergency situations as part of this process. Site Operational Manuals were out-of-date and not reviewed routinely, only after significant/major operational changes. An appropriate quality management system should require a regular review date. Buntingford service reservoir had no site manual available. Chloraminated supplies and water with a free chlorine residual are blended at storage points. The company does not regard this process to be high risk for taste and odour issues. The consumer contact rate for the zones are all low, however, the contact rate is evidently higher, in zones with this mix of sources. There is a risk of generating taste and odour issues through the blending of monochloramine and free chlorine sources which is not recorded in the regulation 28 risk reports.

Northumbrian Water's valves were identified by reference and direction of turn, on a disk on the hatch cover, and this applies across the sites. Every reservoir has a level graph which is visually checked by control room staff twice per shift for anomalies. As well as high and low alarms there are rate of change alarms.

Wessex Water had no policy for the inspection of air valves and inspections were carried out on an ad-hoc basis, but the company has since introduced a risk-based inspection policy based upon the requirements of the Principles of Water Supply Hygiene.

United Utilities' Runcorn reservoir 1 has been out of service for over 20 years, yet a physical connection still existed to the neighbouring reservoir, which is controlled by two closed valves. This reservoir should be physically disconnected.

Site schematics were not always consistent with site arrangements at Severn Trent Water's sites. The Inspectorate previously recommended that schematics were reviewed and updated for all sites following the Broadway

event in November 2012. The company subsequently committed to a new process to bring them up to date.

Yorkshire Water have procedures to manually elevate the chlorine dose within a service reservoir by adding sodium hypochlorite solution. It is added at the hatch nearest the inlet to encourage mixing. It is not considered good practice under any circumstances to apply a chemical dose by such a method and is unlikely to be effective to disinfect water in-situ. It is the Inspectorate's view that there are other preferable options that offer better dose control. The Inspectorate has made this view known in its annual reports in the past and advised the company examines more robust options to protect public health and revises its procedures with a view to superseding the practice of hand dosing of chlorine as a reactive measure in response to a microbiological breach.

Booster Chlorination

Sodium hypochlorite is dosed on the inlet to Southern Water's Rownhams service reservoir, to provide a free chlorine residual in distribution. The hypochlorite dose is adjusted manually to achieve a residual of 0.5mg/l on the outlet of the north compartment. There is no monitor on the outlet of the south compartment, nor is the applied dose monitored, and it was suggested that the company enhances the on-line monitoring of hypochlorite to control the residual leaving the south outlet and the applied dose. The hypochlorite has a cooling system to mitigate chlorate formation. Chlorate is monitored on the outlet of the reservoir.

Similarly there is no on-line monitor to measure the residual chlorine of water leaving South West Water's Houndall service reservoir. The chlorine dose is checked by a water quality sampler during weekly site visits to collect samples. When a dose change is made, an extra visit takes place within 48 hours of the change. The dosing favours one side of the reservoir as there is minimal mixing between the two sides. This presents a risk of over or under-dosing chlorine. The Inspectorate recommended that the company installs appropriate monitoring equipment.

Wessex Water have a booster chlorination system at Chard service reservoir, which aims to maintain a residual of 0.4 mg/l. The company do not appear to have a set policy for turning over sodium hypochlorite stock and top up the tank at varying intervals. This regime may lead to an increase in disinfection by-products due to degradation of the sodium hypochlorite held in-situ for a number of weeks. The company were required to increase monitoring to better understand the disinfection by-product risk.

The Inspectorate identified that one of the triple validation monitors at United Utilities Runcorn service reservoir was not functioning at the time of audit.

Washouts, Drainage and Overflows

Washouts and overflows are critical components in the operation of reservoirs and towers. Overflows in particular pose a contamination risk. Companies should ensure that there is adequate protection from vermin and invertebrate contamination and have a good knowledge of the location of all drains and valves so that they can be inspected and operated when required.

At the four of Severn Trent Water's sites visited, the location of drain valves (i.e. to either sewer or watercourse) was not known by company staff. The company subsequently located those at Highwood and Farnah Green service reservoirs and planned to install flap valves as added protection. It was recommended that Severn Trent Water provide assurance that those responsible for each site has a comprehensive knowledge of the location and status of key valves.

Wessex Water confirmed that there was no flap valve in place on the washout at Chard service reservoir and a similar situation exists at the other service reservoirs audited. Flap valves were also missing from United Utilities' Pex Hill service reservoir.

Flap valves were present at Affinity Water's Buntingford service reservoir, but there were no chains/ropes to check flap valve operation. Companies should consider installing chains and ropes to check for flap valve operation.

The scour condition at Southern Water's Moorhill is not routinely checked. Scour inspection should take place regularly alongside the other routine reservoir checks and across all sites.

Hatches

The integrity of hatches on top of reservoirs is particularly important as these present a contamination risk. Several issues were found on this year's audit programme.

The outer seals on a number of Affinity Water's hatch-upstand joints appeared to be weathered. One hatch at Preston reservoir had no outer seal along one edge. Seals around cable entries also appeared weathered. Issues with insect mesh and condensation drains were also found. The

company had not met its own risk mitigation standards. Previous recommendations on hatch integrity had still not been addressed.

The hatch covering the overflow point at United Utilities Pex Hill reservoir showed soil between the roof of the reservoir and the base of the hatch upstand, a potential point of ingress. This had not been identified during the investigation of a coliform failure at this site. The access hatch at Runcorn service reservoir was within a secure building but was in poor condition with a hole to allow level probes through it. This presents an obvious risk of ingress that needed to be addressed.



Figure 7: Poor integrity of sample hatch at United Utilities Runcorn service reservoir

At Southern Waters' Moorhill service reservoir, there have been numerous false alarms on hatches, which has led to a general lack of confidence in

the system. There was evidence of intruders on the reservoir, with graffiti on some of the hatches. Further measures are required to deter intruders.

An inspection of one of the hatches at Wessex Water's Chard and Snowden Hill reservoirs revealed dirty cables on the level probes. The probes were subsequently cleaned and disinfected. During the inspection of a hatch at Snowden Hill, the operative used a disinfecting spray of sodium hypochlorite solution around the hatch before lifting, whilst this is good practice, there was no labelling on the bottle to confirm that the solution was sodium hypochlorite, and there was no evidence of who made up this solution, its strength or expiry date. Companies should comply with the good practice laid out in Technical Guidance Note 13 of the Principles of Water Supply Hygiene.

Northumbrian Water use a tent to protect hatches from debris, and a brush to clear the ledge between the inner and outer hatch, which was sprayed with 1% sodium hypochlorite solution. All relevant staff receive a half day training course on treated water access.

All Thames Water hatches inspected were found to be in good condition. Cleaning of the hatches is included in the routine checks carried out by technicians who are provided with portable vacuum cleaners for this task. A 'deep clean' is carried out on these hatches following any remedial works undertaken on site. We consider these to be examples of good practice and would encourage the wider industry to consider these practices.

Service reservoir hatches were observed to be in good condition at Yorkshire Water's Thornseat reservoir, locked with a high security padlock and fit-for-purpose. All outer hatches are vacuum cleaned before the inner hatch is opened, this is good practice.



Figure 8: Hatches in good condition at Yorkshire Water's Thornseat service reservoir

Sampling Points

Sampling points need to allow water samples taken to be representative of the water supplied from service reservoirs and towers. It is worth noting that since the audit programme, new regulations have been introduced which require sampling points to meet the requirements of ISO 5667-5 entitled 'Water quality. Sampling. Guidance on treatment of drinking water from treatment works and piped distribution systems'.

There were several examples of sample taps that were not dedicated tappings. An example is shown at United Utilities Pex Hill service reservoir which is not tapped onto the outlet main (Figure 9), but was connected via the booster chlorination system and also has the triple validation residual chlorine monitors connected to the same point. A similar situation exists at Runcorn service reservoir.



Figure 9: Non-dedicated sample line at United Utilities Pex Hill SR

Other examples of non-dedicated sample lines included the sample point at United Utilities' Harrol Edge reservoir, which was also connected to a plumbosolvency test rig and Affinity Water's Buntingford service reservoir had been recently disconnected from a hand wash basin.

A lead rig was plumbed in at Severn Trent Water's Highwood service reservoir which required removing.

At Affinity Water's Preston service reservoir, the sample point is located on a bi-directional main, a representative sample can only be taken when the booster pumps are at rest. A timer system for booster down time failed to prevent an unrepresentative sample being taken.

The sample point for Southern Water's Rownhams reservoir was situated on the outlet of the south compartment. The north compartment runs in series after the south compartment, and was therefore not monitored. The company subsequently installed a temporary sample point on the north outlet, until a permanent sample point could be installed.

At Severn Trent Water's Rodbourne reservoir the sample tap is positioned on the far side of some safety barriers rendering the sampling activity difficult and awkward. This is not conducive to taking representative samples.

External contamination of exposed sample points also presents a risk of unrepresentative samples, with companies often citing environmental contamination as the cause of failures.

There was a tree overhanging the sample point at Wessex Water's Two Ash reservoir, which required cutting back or better protection of the sample point.

All Thames Water sites inspected on the day were found to be in generally good order. The sampling facilities were located in secure kiosks. The sample taps were situated in a clean working area marked out in blue. The sampling facilities were appropriately labelled with instructions for samplers clearly visible (Figure 11).



Figure 10: Clean working area by Thames Water sample point

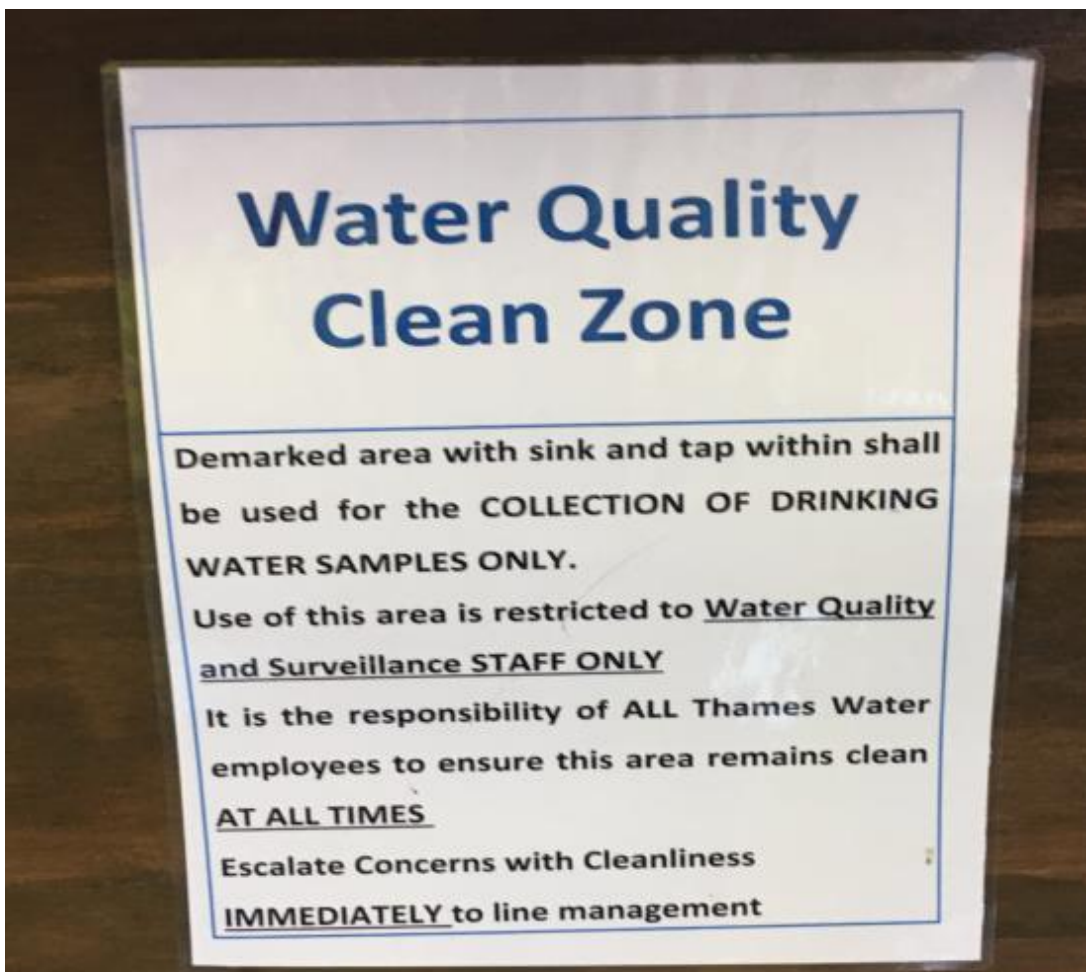


Figure 11: Clear instruction for samplers

Sampling Frequency

A review of the sampling frequency for the service reservoirs audited highlighted several occasions where water quality compliance sampling had not been undertaken in line with the requirements of Regulation 14. Samples representative of water that is leaving the reservoir are required to be taken every week from a sampling tap. Surrogate samples are not acceptable. There were several examples where this was not the case. Guidance on the requirements to comply with Regulation 14 are available on the Inspectorate website.

Reasons cited by Affinity Water for missed samples included staff sickness, low reservoir level, sample pump failures and snow. Many of these are foreseeable and the company should have sufficient resources and appropriate plans in place to catch up on any missed samples. The Inspectorate recommended that Affinity Water conducts a review of sampling collections to ensure weekly samples are collected.

United Utilities identified IT errors and a failure to correctly assign a sample as operational rather than regulatory as the reasons for taking multiple samples within a week. The Inspectorate recommend that the company confirm the procedural changes required to ensure that such duplication mistakes will not happen again.

Examination of Northumbrian Water's sampling programme showed that Downhill and Ryhope reservoirs are almost always sampled on the same day of the week. This is not in accordance with the Inspectorate's guidance and a recommendation was made for Northumbrian Water to introduce randomisation into the service reservoir sampling programme across all company sites.

A review of the sampling frequency for Thames Water's service reservoirs highlighted several occasions where water quality compliance sampling had not been undertaken in line with regulatory requirements, with periods between sampling extending up to 32 days. Reasons cited by the company for missed samples included sampling facility failed, sampling facility was not fixed within that week and sample bottle not received by laboratory. The company had also scheduled additional samples at Woodford Forest reservoir to offset any potential sample cancellations later in the year. The Inspectorate recommended that the company reviews sampling collections to ensure weekly samples are collected in line with the requirement of the Regulations and sections 14.2 and 14.8 of the Guidance.

Yorkshire Water and Wessex Water had designated a number of surrogate sample locations for compliance sampling should the company not be able to sample from the designated tap for any reason. While this may be of benefit for operational purposes, it is not appropriate under the

requirements of Regulation 14. Since the audit, the companies have amended their procedures such that surrogate samples are no longer taken.

Water quality at consumers' taps

The vast majority of samples taken at consumers' taps complied fully with regulatory requirements. From the samples taken to demonstrate compliance with a Directive or national standard, there were a total of 105 failures in Q1 2018. For microbiological parameters, three samples contained *E.coli*. With regard to chemical parameters, the most prevalent detections were for iron (24 failures), taste and odour (18), lead (12) nickel and manganese (6 each). The majority of investigations into the breaches and corrective actions taken by companies were satisfactory. Further commentary on exceptional breaches is provided below.

***E.coli* – 3 failures**

Severn Trent Water failed to provide a consumer with precautionary advice to boil their water following an *E.coli* failure at a property in its Birstall zone, in February. While this action was in line with the company's procedure it does not protect public health, whilst investigations are carried out. Such delays can cause harm to the public and the Inspectorate recommended that the procedure be improved.

Pesticide failures – 8 failures

Of the eight pesticide failures in the quarter, three were metaldehyde (ANH 2, SVT 1). These failures are covered by legal instruments requiring the companies to carry out a range of catchment management activities to reduce metaldehyde input at source. Severn Trent Water also identified the presence of oxadixyl in a ground water source. The company blend the water at a downstream service reservoir to reduce the concentration before it is supplied to consumers. Oxadixyl was effectively banned in 2003 and its presence in the environment is a reminder for companies to be vigilant and ensure that their pesticide monitoring suites covers the widest possible range of substances that may be present in the catchment.

There were two breaches for propyzamide (ANH 1, SEW 1). The failure at Anglian Water's Pitsford works, in March, was determined to be as a result of unusually high concentrations of the pesticide within the reservoir supplying the works, this coincided with a period of increased river abstraction to refill the reservoir after repairs to the shoreline bank. Normally the treatment process in place should be able to cope with the pesticide loading, however, some of the Granular Activated Carbon (GAC) beds required regeneration. The Inspectorate were critical that the company had not recognised the risk of breakthrough that was evident from sampling results since January. The company subsequently took action to replace carbon in absorbers and the works returned to a

compliance state. South East Water are investigating options to remove its Bray works from supply should there be a recurrence of pesticide breaches at this site.

A revised legal instrument was served on Affinity Water following a carbetamide breach in March. Among other activities, this required the company to construct and commission additional GAC contactors to make the pesticide removal process more effective at Iver works. The company were also unable to dose sufficient ozone to the works during this high risk period, due to poor maintenance. The Inspectorate also took action to serve a notice on Southern Water to improve its pesticide removal processes at Burham works, near Chatham.

Taste (4 failures) and Odour (14 failures)

Six of the odour failures were described as 'musty' and advice was given to increase turnover or correct water fittings issues found as a part of the investigation. Companies were unable to identify a cause for four failures and a review of the investigations shows a lack of investigation of leachates from mains as a potential cause associated with failures described as 'sweet', 'bromophenol' and 'acidic'. All of which can be associated with degradation products from mains materials. Companies will be expected to carry out better investigations of supplying main condition and materials in future.

A 'phosphorus' odour detected at a property supplied by South East Water was traced back to an issue at Boxley Greensand works. The company took steps to remove the works from supply and carry out a thorough investigation. This identified a loss of media from half of the pressure filters. This was rectified and the works was run to waste for testing before being returned to supply.

Lead – 12 failures

Of the 12 lead failures, three were in zones covered by the companies' legal instruments for lead. 11 failures (DWC 1, ESK 1, NNE 1, SEW 1, TMS 3, UUT 3 and WSX 1) resulted in communications pipes being replaced, where lead was found, and advice provided to consumers where lead was identified on the consumer's side. Following a failure identified at a school, Thames Water worked with the school to ensure that the 50 metre lead service pipe running beneath the school playground was replaced. Advice was given to flush taps until this work could be undertaken in the school holidays. The Inspectorate were critical of United Utilities following a lead failure on a shared supply. While the consumer at the original failing property was given advice on how to address the lead risk, the neighbours facing the same risk were not. The company also fell short of the requirements to carry out appropriate investigations into lead

failures. United Utilities subsequently improved their procedures to address the issues raised.

Nickel – 6 failures

All six failures were attributed to plumbing fittings within individual properties. Two of these failures were in properties where the water was standing for some time (cafeteria undergoing refurbishment, low use tap in shop). 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 made recommendations for United Utilities to improve its investigation procedures.

Aluminium – 4 failures

The failure at Thames Water's Bicester zone in January was well in excess of the PCV and double the WHO proposed guideline value at 1879 µg/l. The company linked the level of aluminium to the disturbance of mains deposits following a leak on a six inch main. The company were unable to clearly demonstrate that the levels of aluminium leaving Swinford works were satisfactory as the monitor had not been operational for several months before the failure. The monitor was repaired following a recommendation by the Inspectorate.

Iron – 24 failures

Four of the failures were covered by legal instruments, whereby companies are required to take action to identify and mitigate the causes of the failure. The majority of the other failures were short-lived and appropriately remedied by water companies. However, the Inspectorate made recommendations in relation to three breaches at United Utilities due to deficiencies in the timeliness and extent of the company's investigations into iron failures.

Manganese – 6 failures (DVW 1, DWR 1, UUT 3, YKS 1)

Three of the six manganese failures were associated with improvement notices, whereby the companies are putting in place measures to reduce the likelihood of manganese failures by improving treatment facilities and removing long standing deposits of manganese from the distribution network. In the other three instances, the companies took appropriate action to remove the mains deposits by flushing.

Regularity of Sampling

Occasionally, something out of the ordinary occurs when assessing water quality compliance data that requires the Inspectorate to take a closer look. One such example related to Wessex Water's data for March 2018, which included two samples that were taken in the same zone, on the same day, at the same time to the minute.

A wider examination of the company's data showed that it was common for multiple samples to be taken on the same day in the same zone, where these zones had a relatively large population. It was identified that Wessex Water regularly rescheduled samples to be taken on the same day for a variety of reasons.

This is not in accordance with the Inspectorate's guidance on compliance with Regulation 9 of the Water Supply (Water Quality) Regulations. Companies are required to take samples at regular intervals throughout the year and with sample frequencies for all parameters at consumers' taps being required less than once per day, taking multiple samples from a water supply zone on the same day fails to meet this requirement.

Companies are also reminded that they should ensure that they have sufficient sampling manpower and analytical capability to ensure that this requirement is complied with. Clustering of samples to compensate for an earlier shortfall, incurred for example during a period of high workload, or staff holidays, indicates a failure to comply with Regulation 9.

If, occasionally, a water supplier fails to take or analyse a prescheduled compliance sample, for example because of a broken sample bottle or analytical quality control (AQC) breach, it should reschedule a further sample as soon as possible, to be taken, as far as practicable, well in advance of the next programmed sample, provided the resampling is prompt, occasional occurrences of this type will not be regarded as a failure to meet the regularity requirement.

The Inspectorate were satisfied that Wessex Water responded appropriately to address these scheduling issues and ensure that they do not recur.

Transformation Programmes

As reported in previous reports by the Chief Inspector, the Inspectorate adopts an approach to regulation and enforcement that follows the key principles of better regulation to allow companies the opportunity to address breaches or potential breaches of the regulations before it results in enforcement action. Recommendations form this first level of intervention and the responses to these, amongst other indicators, are used to track the risk status of companies. Where a company is seen to attract multiple recommendations (i.e. for repeat breaches or potential breaches of the same regulation; multiple recommendations under a certain theme; or numerous recommendations for multiple reasons), the Inspectorate increases the regulatory scrutiny of this company, usually through increased audits and engagement at all levels of the company. Where the risk status of a company continues to rise following this, further evidence from the company's regulatory submissions will be drawn upon to assess the Company's performance including but not limited to compliance breaches, risk assessment reports and their event history. The Inspectorate will then review this body of evidence to assess the final risk profile of the company. Where a company presents a high risk profile for a significant period of time and the company have not addressed it, the Inspectorate will progress to the next stage of enforcement action and this may include the entry of the company into a transformation programme.

The intention of transformation programme is to:

*Reposition the company as a service company, with a central focus on the service of Drinking Water Quality, with this being the core motivation for **all** company staff"*

A transformation programme is usually a package of notices served by the Inspectorate to address the identified risks and deficiencies within a company. The notices are reviewed in collaboration with the company to produce deliverable mitigation measures. The effectiveness of a transformation programme is heightened by this co-operation with companies as they are in the best position to self-evaluate the reasons for the issues identified by the Inspectorate and suggest how these can be addressed.

The release from a transformation programme will be determined by the successful delivery of the notice requirements and the improved performance of the company in terms of its risk profile, timely delivery of existing commitments and clear demonstration of a step change in company approach and ethos.

Sharing knowledge and learning is considered good practice. As part of an ongoing awareness to the Industry about how the Inspectorate works collaboratively to improve the operational or management aspects of water quality performance, the previously reported transformation programmes is continued with some examples of poor practice themes.

Compliance

In our formative critical review of deficiencies across the companies within a programme, it was identified that the area of non-compliance with the water quality standards was a significant failing.

For a compliance assessment, an Inspector will look at the evidence, which includes the compliance data, but also examines any wider performance issues such as promptness of delivery and success of the outcomes. Account is taken of any repetition of failure to comply with the regulations and assesses the companies' short, medium and long term plans for remediation.

Where the company has had a history of adverse outcomes, repeated non-compliance with no realistic prospect of being able to categorise the failures as being: unlikely to recur in the near future; failure to mitigate; or failure to meet or set timely programmes for remediation, then the Inspector works with the company to establish a series of legal instruments to ensure that the company can return to full compliance in the most timely manner possible.

People and culture

Across all the programmes, people and culture are probably the most significant contributor to a poor performing company. It is also the most difficult for the Inspectorate to engage with, as an understanding of a company's culture requires time and exposure to how the whole organisation operates and how performance is driven. Good results have been seen where companies have involved all levels of the business and worked with their communications teams to promote the strategy as seen in Severn Trent Water and United Utilities where staff were actively involved in inputting into suggestions for improvements.

Another successful element of the people and culture programmes has been the evaluation of skills needed to perform a job role, redefinition of the roles and subsequent training gap analysis. The activity has received positive feedback from many of the staff who have benefitted from additional training and also from gaining formal academic recognition. Southern Water operational staff, for example, are working towards NVQ qualifications.

Regulation 26

An area where there was evidence of the need for additional improvement for every company was around all aspects of regulation 26; including the requirement to adequately treat and prepare water for disinfection and to maintain continuous disinfection at all times.

It was identified that several companies are still subject to transient periods where the water may not meet the requirement for turbidity <1 NTU at all times prior to entering the disinfection stage. With the requirements of this regulation having been in place for a number of years the Inspectorate is acting on any apprehended failure and is verifying that companies have in place, clearly defined action plans to ensure compliance. The transformation companies have identified sites where modifications are required and have appraised the risks using the Drinking Water Safety Plan approach.

Improvements have been implemented in a number of different ways, such as improved monitoring and visibility to allow for greater control over pumping of groundwater; run to waste facilities; and improved monitoring in the form of new style turbidity monitors (which potentially provide more accurate measurement and less chance of measuring entrained air which may give rise to erroneous turbidity readings). Several of the companies have also chosen to invest in modifications to contact tanks after dynamic modelling of the contact tank demonstrated structural modifications would allow for a greater contact time and improved flow through the tanks. A few contact tanks were also identified as having reached the end of their asset life.

Cryptosporidium

Despite well documented cases and events posing significant risk and impact to consumers from *Cryptosporidium*, it is a grave concern that there is still much work required for companies to improve the treatment options against such a high risk to public health.

While it is satisfying that there has been appraisal across the industry of risks from this pathogen using the Drinking Water Safety Plan approach, there is still fundamental work to be continued regarding assessment of the potential pathways and catchment risks of this pathogen reaching source waters. Following recent technical audits carried out by the Inspectorate it has been necessary to issue a number of regulation 27 (4) notices compelling companies to review their catchment risk assessments and the methodology for capturing pathways and all hazardous events.

There is the need for renewed emphasis on catchment in source to tap assessment, which should include regular 'walking the ground' activity. When Inspectors have made site visits, they have witnessed

undocumented and unmitigated risks to sources. It is essential that companies self-identify sources and make a robust evaluation of risk, followed by appropriate mitigation.

A transformation programme for some companies has facilitated an appropriate focus on risk assessment. Companies have shown that an aspect of their *Cryptosporidium* schemes has led them to examine treatment options. Several companies have chosen to install additional on-line turbidity monitors and particle counters as well as UV post main disinfection. There has additionally been the re-evaluation of the operation and performance of filters and organic matter removal stages.

Service reservoirs

Sadly there remain deficiencies which are noted by the Inspectorate day-on-day with treated water storage. The condition of storage assets and their inspection rates are still of concern. Companies have full control over their treated water storage facilities but the Inspectorate still sees issues which may be indicative of a lack of investment and priority over this aspect of the supply chain.

All transformation programmes to date have included service reservoirs in a legal instrument and some typical measures may include bringing the inspection frequency into a risk-based programme (typically less than every eight-ten years). Many companies not subject to a transformation programme are moving to a risk-based one in five frequency. There has also been a focus by companies to examine the criticality of assets and also think about the resilience of supplies as many cite a reason for extended intervals between inspections is the inability to isolate the asset. Several companies are investing to address this and allow for greater flexibility across the network.

There have also been advances in analytical technology in the form of flow cytometry, which is proving a very useful tool in the monitoring and characterisation of stored water. In addition, for many companies the technique is proving very insightful when used at the inter stages of treatment. This tool is being championed and piloted across the industry and there is an active working group who share and compile data. Early outputs from the group are showing that this tool may be sensitive enough to pick up subtle changes in water quality which may allow for early detection and action when there is a deterioration or sudden ingress event.

Demonstration of the benefits from transformation programmes

The Inspectorate has in place programme managers who actively monitor the progress companies in transformation and who develop an intrinsic knowledge of the content of the programmes. They report upon key elements of the successes seen to date from companies in transformation; they have the ability to help identify deficiencies, put in place clear milestones within a programme and also regularly carry out their own internal checks and audits of progress.

No revocation from a legal instrument issued as part of a transformation programme is made without clear, evidence based information to show the demonstrable benefit to consumers and water quality; compliance with the regulations and mitigation or elimination of future risks.

Engagement in the course of the transformation programmes together with ownership and accountability are seen to be important factors and companies with high levels of staff understanding and involvement have reported very positive outcomes, far and above the objectives of the original sets of legal instruments designed to initialise the transformation process.

It is always acknowledged that these programmes are complex and ambitious in their nature and they are designed to be so, with the desire that there will be something new, evolved and distinctly different being in place at the end of the programme. However, the commitment, resolve and hard work of all the companies in transformation is not underestimated.

While each legal instrument remains bespoke to each company, there are steps taken to ensure a proportionate and consistent approach across the industry and that where the burden of reporting on the programmes can be reduced, that this occurs through the streamlining of reports.

It is the intention of the Inspectorate to highlight the outcomes of these programmes regularly and companies are encouraged to work together to share best practice and highlight areas where greater gains can be made for all.

Enforcement and Risk Assessment work in Q1

Total New Enforcements – 21.

17 Regulation 28(4) Notices; DWR (2), SRN (9), UUT (5), YKS (1).

2 Regulation 27(4) Notices; SRN (1), TMS (1).

2 Section 18 Enforcement Orders; SRN.

1 Radioactivity Waivers Application;CAM.

13 Milestone Reports received; DWR (4), NNE (1), SRN (4), SWT (1), TMS (2), UUT (1).

16 Change Applications received; AFW (1), DVW (1), DWR (4), NNE (2), SRN (1), TMS (1), UUT (5), WSX (1).

18 Closure report received; DWR (4), SEW (1), SRN (2), SVT (3), SWT (1), TMS (2), UUT (5).



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