PRIVATE WATER SUPPLIES – CASE STUDY 2018/05

Long standing water quality contamination

In October 2018, Inspectors met with representatives from a local authority in North Wales to provide advice in relation to mitigating some long-standing water quality risks associated with a Regulation 9 private supply in their area. This supply is derived from a stream, located about a mile from the properties supplied and had a history, over many years, of elevated iron levels and periodic detections of microbiological indicator organisms associated with the source water, which had led to a loss of confidence in its fitness for consumption by consumers. The supply in question serves around 100 residential chalets, some of which are occupied as permanent dwellings, while some are let as holiday homes and therefore subject to transient use for part of the year. This site and its supply are positioned in an elevated and exposed rural location, which experiences extremes of weather. The owner of the land, including initially the land where the source is located (the owner later sold this part of the land), and the commercial holiday business, does not live on site but nevertheless exercises control over the supply without permanent on-site assistance. In 2011, when the local authority carried out its initial risk assessment the raw water was being filtered through sand. The local authority had concerns around its effective management and maintenance and bromine was being used as a disinfectant, which the local authority correctly deemed inappropriate. The water was then pumped to storage vessels before being piped to consumers' properties.

In April 2011, the local authority served a Regulation 18 Notice (now Regulation 20) requiring improvements to the supply. This resulted in the installation of a chlorine dioxide disinfection system in June 2011. At the same time a large treated water storage vessel was removed by the owner, possibly due to its poor internal condition, following advice from a contractor and new storage tanks were installed, along with locks on hatches and valves. However these new storage tanks subsequently became corroded due to their exposed location. The newly replaced treatment plant was installed in a garden shed, which afforded little protection and security.

Residents were reportedly suspicious about the quality of, or extent of, the works done, and a site visit by the local authority in 2011 revealed tampering with the treatment system, and padlocks sawn off the treatment hut door, which the owner attributed to the residents. The local authority suspected that, if this was the case, they were probably seeking to confirm for themselves that new

equipment had been installed as they had no trust in the information that the owner provided.

Throughout the next seven years, regulatory samples taken by the local authority contained, periodically, elevated concentrations of iron, some of which were above the regulatory standard of 200µg/l. In addition samples taken in 2012, 2015, 2016 and 2017 contained *E.coli* resulting in consumers being advised to boil the water before consumption. The restrictions were lifted once satisfactory sample results were obtained and by November 2017 point-of-use treatment had been installed at some of the chalets to mitigate the ongoing microbiological risks in the longer term.

Despite this, consumers continued to experience discoloured water and although they regularly complained to the owner, he continued to refute that the supply was unacceptable and unsafe, and threatened to cut off both electricity and the water if they continued to harass him.

Furthermore, residents were not satisfied that these issues were being adequately tackled by the local authority to bring about a solution from the owner and they made a formal complaint to the local authority's ombudsman, whose investigation concluded that the council had acted appropriately. Unfortunately residents inferred from this that the council was protecting its own interests, and subsequently contacted Welsh Government, the Inspectorate and their local MP at various times asking for support.

Figure 23: Extent of discolouration of water

By 2016, the local authority were required to carry out another risk assessment of the supply as required under the regulations. On this occasion the local authority used the Inspectorate's risk assessment tool. This identified a number of high risk hazards and an action plan required the owner to complete a number of remedial actions to mitigate a number of high risks including work to clean around the abstraction point, cut back vegetation, remove sediment from the storage vessels (which appeared poorly maintained) and repair exposed pipes on the distribution network caused by storm damage.

Although the owner had employed a contractor to routinely take samples, there was no water safety plan in place for the supply and the owner refused to provide a schematic of the site, so preventing the local authority from fully assessing the extent of the supply. The local authority had limited confidence in management of the supply, and concluded that it was vulnerable. They also determined that the point-of-use devices fitted a year earlier were now blocked, a consequence of the persistently elevated iron levels, due to no effective removal and this was compounded by a suspected accumulation of sediment in the storage tanks.

The owner insisted that these were property specific issues caused by poor plumbing and as such refused to take responsibility for the cause. The owner did not complete the actions as required and in August 2018 the local authority served a Regulation 20 Notice compelling him to mitigate the potential danger to human health, which the various inadequacies constituted.

Various correspondence to Government departments came to the attention of the Inspectorate via one of the residents. The Inspectorate's main legislative remit for private water supply regulation is to provide technical advice to the regulator (the local authority), and as such and in view of the protracted nature of the issue, we subsequently met with the local authority concerned at their office in north Wales; a meeting which in part was attended by the site owner by invitation by the local authority. The Inspectorate concluded the following:

- The site owner's attitude and past behaviours suggested that he had no intention of mitigating the water quality risks and never had. Furthermore he considered that the consumers had no right to complain;

- The supply was a potential danger to human health by virtue of its lack of adequate treatment, management and maintenance;

- The owner appeared to have been poorly advised by his contractor when installing an iron removal process, which later proved inadequate for the raw water challenge;

- The local authority had chosen not to serve a Section 80 Notice at any time for unwholesome water (notably iron above the regulatory standard) due to the lack of consequences if not complied with. The only option open to them if the relevant person does not comply is to carry out the

works in default. Although the costs of the work are technically recoverable from the relevant persons retrospectively, this has been shown to be a potentially lengthy, costly and unsuccessful;

- Although the local authority had acted on isolated parameter breaches over a prolonged period, and protected consumers in the short-term, it had not applied risk based methodology to effect a robust long-term solution in a timely manner. While sympathetic to their reasons, the local authority had not properly addressed the root causes of water quality risks using effective enforcement.

DWI recommended that the local authority update the current Regulation 20 Notice, or revoke it and serve a new one with a three month completion date for actions and, if this is not achieved to carry out the actions themselves, which is permissible and can be done at their discretion under Regulation 20 (7) and (8) of the regulations. Furthermore, that it should consider legal action, taken in the local Magistrates' Court, against the site owner for non-compliance with the Notice by virtue of inadequate mitigation of risks to human health. The local authority is currently working to implement these measures.

This case study illustrates the importance of ensuring that root causes of water quality risks are identified and mitigated in a timely manner. In this instance the cause of periodic sample result breaches was in part due to poor supply infrastructure and inadequate treatment; however this was symptomatic of the fundamental inability and refusal of the person exercising control to adequately manage the supply. This was compounded both by the fact that the owner lived off-site, several hours drive from supply, and that his attitude and behaviour to residents led to their distrust and disrespect for him. Although the council broadly complied with their regulatory duties and endeavoured to provide solutions, water quality parameter breaches continued to recur over many years, resulting in residents losing confidence in the quality of the supply.

These sample failures were almost certainly a manifestation of the deficiencies highlighted in the two risk assessments, which were never adequately addressed and remedial work was never completed. Any resamples that were satisfactory were considered, by the local authority, to indicate a safe and wholesome supply. However, these were only indicative of quality at the moment they were taken and in reality the supply was inherently a potential risk to health due to the deficiencies identified in the risk assessments. Although microbiological risks were mitigated to some extent (at least initially) by point-of-use devices in the chalets, these quickly became blocked and ineffective due to elevated iron in the raw water for which treatment was inadequate. Indeed this was verified by the results of samples taken by the owner's contractor, which the owner failed to act upon. The elevated iron in the final water was also self-evident by its visual appearance (see Figure 24).

The local authority chose not to serve a Section 80 Notice to the relevant person in response to elevated iron, which the Water Industry Act 1991 gives discretion over. Their reasoning was to avoid potential additional burdens, both to themselves and local residents; however unfortunately this only served to prolong the issue further without resolution. The Inspectorate has found that due to resourcing and financial constraints within local authorities, there exists a general reluctance to commit to the completion of remedial work in default, which further hampers any progress to fix the inherent problem and so creating ongoing. Furthermore local authorities generally continue to enforce under Regulation 18 (20 in Wales) only when an actual risk manifests through the detection of a health based parameter, rather than observed potential risk, as informed by risk assessments. Both deficiencies serve only to prolong and increase the risk to consumers, as this case study clearly illustrates.