Drinking Water Quality Regulator for Scotland

Incident Summary

Balmore WTW
High pH
January 2023

DWQR Inspector:
Colette Robertson-Kellie

Event No. 13196

Event Category: Serious

The standby Operator was called out to Balmore WTW at 19:04 on Friday the 20th January for a high pH alarm from the flocculation stream. Blockages in the alum dosing lines from debris from the alum tanks were cleared and the filters were backwashed. The Operator left site at 02:25, and to comply with the Working Time Directive went on to rest time. Between 02:25 and 03:19 on the 21st January a tripped treated water sample pump alarm and then a low treated chlorine alarm were received by the Intelligent Control Centre (ICC) – these were passed on to the standby Operator, who was unable to return to site as he was on rest time. The ICC was unable to locate another Operator to attend site, and at around 03:15 the ICC escalated the issue to the Escalation Team Leader. During the call the site residual chlorine trends were checked, and it was agreed that they were healthy and the alarm had been triggered by the tripped sample pumps. The ICC continued to monitor the site and continued to attempt to locate an Operator to attend site from the Balmore rota, but none could be found. Further calls were made to the Escalation Team Leader, and remote monitoring continued, with an agreement to call the standby Operator out when his rest period ended at 13:00. At 09:45, a high final water pH alarm was received by the ICC, and then the Emergency Action level pH of 9.2 was breached at 10:55. This was reported to the Escalation Team Leader and to the Public Health Team (PHT) at 11:45, and samples were arranged. At 12:05 the pH exceeded 9.5, and the option of getting an Operator from the Milngavie standby rota was discussed by the ICC and the Escalation Team Leader; this was not progressed as the Balmore standby Operator rest time was due to end at 13:00.

The Balmore standby Operator arrived onsite at 13:12 and found that since the treated water sample pumps had tripped, and there had been no flow through the treated water pH monitor for an extended period of time, the online treated pH monitor readings had dropped and had then frozen at pH 8.3. This caused the lime pumps to respond to this low reading to try to achieve the pH target of 8.6, leading to an undetected high treated water pH and a subsequent increase in final water pH.

The treated water sample pumps were reset and restarted and the lime pump speeds

manually reduced, and bench testing showed that the final water was pH 10.1 at 14:24. The standby Operator kept the ICC, the Escalation Team Leader and the PHT informed, and by 21:45 the final water pH was below the site EAL.

The PHT had requested sampling from the Sampling and Logistics Team Leader for the 21st and 22nd January for a standard suite of parameters. However, since Balmore WTW is sampled 365 days a year, the Sampling Team erroneously assumed that a pH sample would be taken from the works as part of the daily sampling and so did not supply the correct sample bottles, meaning that pH samples on the 21st and the 22nd September were not taken for laboratory analysis. Sampling in the network showed no failures of the pH standard, thought to due to downstream dilution from storage tanks and mixed water operational zones in the network.

The cause of the incident was a failure to respond to a number of alarms due to a lack of availability of Operators on standby.

The event has been categorised as serious. Scottish Water has identified five actions which DWQR accepts are appropriate and will monitor to ensure they are completed prior to signing off the incident. DWQR made two additional recommendations.