

Rawburn WTW
Iron Failures
22nd October -14th November 2023

DWQR Inspector:
Colette Robertson-Kellie

Event No. 13949

Event Category: Significant

On Sunday the 29th October 2023, Operations staff observed that filtered and final water iron concentrations at Rawburn WTW were higher than expected. Ferric sulphate is used as the coagulant at the treatment works and there had been a deterioration in the raw water quality supplying the works. The backwash cycle was adjusted and the coagulant dose increased. The situation was escalated to the Intelligent Control Centre (ICC), and to the Public Health Team (PHT). The PHT advised on sampling for microbiology, metals and chemical parameters, and a *Cryptosporidium* sample filter was fitted. The Operator left the site at 17:00, but at 03:00 on the 30th October the ICC called the standby Operator out to the site, as iron levels had reached 200 µg/l (the regulatory standard for iron at consumers' taps is 200 µg/l). At 04:00 the Operator began a series of adjustments to treatment processes - the ferric sulphate dose was increased, clarifier pH setpoint was adjusted and the flow through the works was reduced. The Process Science Team arrived at the site at 10:30 and suggested that the coagulant dose should be reduced to try to increase the pH of clarified water to precipitate iron so that it could be removed on the filters. For the next nine days, operational staff made many adjustments to the coagulation dose, varied filter backwashes to manage head loss, and also managed flow rates through the treatment works in attempts to manage water quality while ensuring continuity of supply. On the 10th November a temporary sodium hydroxide dosing rig was put into service to raise coagulation pH following laboratory trials by Process Scientists, but it was taken back out of service after an hour as filtered iron and turbidity quickly increased.

Trends from the online post filter iron monitor show that iron levels dropped below Scottish Water Emergency Action Limit in mid December.

There were 18 failures of the iron standard during this incident, and sixteen consumer contacts. Fourteen of the contacts were for discoloured water, one was for taste and odour, and one was for health/illness. *Cryptosporidium* sample data has not been reported as part of Scottish Water's incident report.

Network cleaning to remove iron deposits is routinely carried out on the network and Scottish Water has committed to confirm further cleaning plans for the area.

The cause of the incident was inadequate coagulation treatment and control.

The event has been categorised as significant. 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 three additional recommendations.

