

Lintrathen WTW
Significant loss of control of treatment
process
1st September 2023

DWQR Inspector:
Andrew Kennedy

Event No. 13849

Event Category: Significant

On 1 September 2023, a loss of polyelectrolyte (poly) dosing at Lintrathen Water Treatment Works occurred following a drop test being carried out. The standby operator had been called to site earlier that morning in response to an individual filter turbidity monitor fault (false high turbidity reading), which initiated rapid gravity filter (RGF) no.5 to repeatedly backwash. Having arrived on site, the standby operator inhibited the repeated filter wash of RGF no.5 and resolved the issue with the turbidity monitor, however by this time the other RGFs were experiencing high headlosses having over-run their programmed wash-cycle timings. The standby operator subsequently reduced the inlet flow to the WTW and adjusted the coagulation aluminium and poly dosing which are manually controlled, before carrying out a drop test on the poly dosing system. During this drop test, an analogue inhibit switch was not turned and the poly pumps tripped as a result. The standby operator contacted the local operator and reset the pumps, but was unaware that there was no poly being dosed following the reset despite the pumps running.

Following the loss of poly dosing, the filtered turbidities increased rapidly, with individual turbidities breaching the emergency action levels (EAL) of 0.32NTU for 8.5hrs, peaking at 1.4NTU, whilst combined filtered turbidity was above EAL (0.25NTU) for approximately 9.5hrs, potentially reaching 1.5NTU (online monitor on SCADA scaled to 1NTU). Alongside the elevated filtered turbidities, filtered aluminium monitors for RGFs 1-3 and RGFs 4+5 were above 200µg/l for 6hrs, whilst the combined filtered aluminium monitor was above 200µg/l for 2.5hrs.

The standby operator continued to wash the filters in sequence and adjust the aluminium and poly doses (unaware that no poly was being delivered) before the day shift operator arrived on site at 8:00am, at which point a further drop test was carried out, where it was established that no chemical was being delivered. The pumps were reset and further adjustments in alum and poly dosing were made over the following hours based on stir test results, with treatment performance restored from 17:30pm.

One scheduled bacteriological sample was taken at 08:45am and an additional Cryptosporidium filter was put on at 15:10pm on 1 September 2023. Although Scottish Water's Public Health Team (PHT), requested an additional Chemical and Metals sample in response to the event, this was not taken. There were no scheduled final water or scheduled zonal samples taken in the days surrounding this event which failed regulatory samples.

It is clear from Scottish Water's Incident Report that the deterioration of water quality as a result of a loss of poly dosing following a drop test. I am of the opinion that the following factors also contributed significantly to this incident:

- A lack of information available to the ICC on SCADA for Lintrathen WTW
- A lack of site knowledge
- A lack of site specific procedures to support less experienced members of staff
- A lack of automatic / flow proportional chemical dosing
- Deficiencies in the effectiveness of the existing Risk Control Measures for the poly dosing system
- Poor communication between teams

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

