

Assynt WTW Loss of control of treatment process 30th May 2023

Event No. 13429

Between 28th May and 30th May 2023 a number of treatment issues occurred at Assynt Water Treatment Works (WTW), resulting in multiple plant shutdowns, a critically low water level in the Clear Water Tanks (CWT) and approximately 2 and a half hours of non-compliant water passing forward into supply with elevated levels of Aluminium due to one of the Poly Aluminium Chloride (PACL) pumps overdosing.

At 2:23 am on 28th May 2023, a plant shut down occurred due to a PACL pump failure. An operator attended site, restarted the plant and changed the duty PACL pump to pump B, with Pump A being isolated. The plant subsequently shutdown due to an issue with the coagulation pH control, which was later identified to be a result of a pressure reducing valve (PRV) failure on the lime-dosing system. Having restarted the plant around 9:00 am, work was undertaken on the lime carrier water PRV by Scottish Water's E&M team and treatment performance recovered for the rest of the day.

A second operator attended Assynt WTW on the morning of 29th May 2023, and bled PACL pump A and returned the pump to supply to see if the issue was resolved. Having returned PACL pump A to supply, the Coagulation pH dropped and permeate aluminium levels increased, prompting the operator to revert the PACL duty pump to pump B and manually start the site run to waste as the pH remained low and aluminium remained high. Following the implementation of the manual run to waste and whilst the operator was trying to stabilise the coagulation pH control loop, a plant shutdown was triggered, resulting in the rising main

to the CWTs emptying (through the run to waste scour valve), meaning that a 6hr manual plant restart was required.

The operator carried out the plant manual restart process, however, they were unaware that the defective PACL pump A had returned to duty and was overdosing PACL, resulting in a second slug of water containing high levels of aluminium (0.35 to 0.64mgAl/l) passing forward to the CWTs, which at this point were at a critically low level despite Scottish Water having taken the decision to return CWT 1 and CWT 2 to supply early having had partial sample results from the tanks following a period of time offline for repairs and cleaning.

Throughout the event, water with elevated levels of aluminium passed forward through the works for circa 3.5 hours over two separate occasions before the duty PACL pump was manually changed to pump B at 22:30 and the coagulation pH control settled and treatment process recovered.

Sample were taken from the treated water, CWT No.3 and CWT No. 4 at Assynt WTW as the plant stabilised, which showed levels of aluminium above the prescribed concentration value (PCV) at 594µgAl/l, 254µgAl/l and 254µgAl/l respectively. Samples taken from the final water, CWT's and customer taps in the two days following the event all passed

It is clear from the information provided by Scottish Water that this event was caused by a defective PACL pump which was dosing significantly above the required dose due to an incorrect software setting.

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

