



Drinking Water Quality Regulator
for Scotland

Incident Summary

Savalbeg WTW Aluminium failure October 2018

DWQR Inspector:
Moira Malcolm

Event No. 9742

Event Category: Significant

On Monday 24 September 2018 the operator attended Savalbeg Water Treatment Works (WTW) following an alarm callout from the Intelligent Control Centre (ICC) for differential pressure from Dynasand Filter 2. Adjustments to the airlift system were made and investigations continued over the following three days where more sand was added to Dynasand Filter 1, and a perished seal was discovered and replaced in the Dynasand 2 airlift pump. Tankering was undertaken to support the Clear Water Tank (CWT) due to high demand and precautionary periods of run to waste during this period. Bench tests were used to check aluminium levels as Savalbeg has no final water aluminium monitor and the treated water aluminium monitor was unreliable, with the fault reported in July 2018. At this point the bench analysis appeared to be giving consistent readings around 0.1mg/l. The standby operator highlighted that the bench equipment was an older model but it was felt that the readings were accurate.

Water quality and hydraulic performance issues with Dynasand 2 continued on Saturday 29 September, and it was decided to run the plant to waste until improvements could be made, with tankering arrangements in place to support this. The Process Scientist checked the process chemistry and found this to be satisfactory, but a cracked connection in the Dynasand 2 airlift pump was discovered and replaced. Run to waste continued until Monday 1 October when the performance of Dynasand 2 had sufficiently recovered, with satisfactory bench testing, however subsequent laboratory samples taken on 1 and 3 October from Savalbeg WTW final water sample tap showed aluminium levels above the Prescribed



Concentration or Value (PCV). Mitigation measures ensued, including the cleaning of the CWT and Chlorine Contact Tank (CCT) but the option to clean the Dynasand media in situ was not progressed due to access and Health and Safety concerns. Tankering continued to support the site activity with periods of the works running to waste. Sampling on 8 and 12 of October showed that aluminium levels had fallen below the PCV. Dynasand 2 had its media removed and cleaned and the pipework and static mixer between Dynasands 1 & 2 was also cleaned. The cleaning operation found significant aluminium deposits at all stages, and following the cleaning the hydraulic performance improved considerably. Scottish Water's investigation and root cause analysis showed the cause of this incident to be a combination of issues with the airlift pump in Dynasand 2 and also the condition of the media in Dynasand 2, with the build-up of aluminium deposits then being displaced during the tankering operation when the CWT was at a low level and flushed into supply.

However the cause for these issues is the chronic under investment and lack of ongoing maintenance at Savalbeg due to the expectation of a new WTW which is currently being constructed and due to be operational by the end of 2019. This new works was originally expected to be complete by July 2019. DWQR audited this site in 2017 where the answer to many of the issues and risks identified on site and in the Drinking Water Safety Plan was the provision of the new works, but in the meantime no major maintenance – including cleaning the pipework, CCT, CWT or replacing the media has been done, mainly because Savalbeg is a single stream works so this would involve taking the whole works offline for up to 10 days and would require significant tankering support. In addition, monitoring at Savalbeg is poor. There is no final water aluminium monitor and the treated water aluminium monitor had been reading erratically since July, with operators relying on bench tests using outdated equipment. No bench tests were included in task scheduling for final water aluminium monitoring. It is disappointing that additional laboratory samples were not arranged earlier to confirm the water quality leaving the works, as this may have highlighted the under-reporting of the bench aluminium monitor. It is disappointing that the recommendations DWQR made following our audit of the works in 2017 to install representative turbidity monitors after both Dynasand Filters 1 and 2 were not implemented by the time of this incident as this would have given further insight into the issues and may have resulted in earlier intervention. It is vitally important that when a WTW is nearing the end of life it continues to be maintained to a sufficient standard to ensure that it can run efficiently and that water to consumers is compliant with regulatory standards to the very last day and not compromised by the age of the works. No lesser standard is acceptable.



The event has been categorised as Significant. Scottish Water has identified fifteen actions which DWQR accepts are appropriate and will monitor to ensure they are completed prior to signing off the incident. DWQR made no additional recommendations.

