



Drinking Water Quality Regulator
for Scotland

Incident Summary

Port Charlotte WTW
Manganese Failures
14th August 2022

DWQR Inspector:
Moira Malcolm

Event No. 12794

Event Category: Significant

On the evening of 13th August Scottish Water's Intelligent Control Centre (ICC) called out two high final watermanganese alarms to the standby operator for Port Charlotte WTW. On both occasions the alarms were discussed and operators opted to wait until the morning to attend site.

On the morning of Sunday 14th August the ICC called out a shutdown alarm for power issues. The operator attended site to restart the plant and noted that interstage pH was not optimal and that final water manganese levels were breaching the EAL with a bench test of 146µg/l. This was passed to the Escalation Team Leader and an incident team was formed.

Two of the manganese contact tanks (MCTs) were backwashed and the plant run to waste with service reservoirs isolated. Direct fed consumers were supplied with bottled water. That afternoon the manganese levels going into distribution were considered by the Public Health Team not to pose a health hazard, so the plant was restarted to prevent the distribution network from being scoured leading to potential further failures. The pH was increased to aid manganese removal and interstage and final manganese levels were monitored throughout the day. When levels were trending downwards the operator left site. A further plant shutdown brought the standby operator out at 23:00hrs. Final manganese levels were still trending downwards (despite high raw and interstage levels).

Over the next few days the raw manganese levels fluctuated, requiring the works to be run to



waste again and set points for interstage chlorine increased to aid manganese oxidation. By the 16th the MCTs were noted to not be removing manganese at the same efficiency, with MCT B removing far less than A or C (6% compared to 70% and 75% removal). By the 17th the treatment works was coping with the spiking raw water and final water was consistently compliant for manganese.

Filtec inspections of the MCTs discovered that MCT B had 75% media loss, with MCT A with 60% and MCT C 50% of media missing. MCT B was isolated immediately. Cleaning and media replacement was carried out on 30th August. MCTs A&C were scheduled for media replacement in November 2022.

Laboratory and network sampling and WTW performance monitoring continued until 29th August. By 1st September all performance and sampling results were satisfactory, and routine monitoring resumed the following week.

The incident was caused by a lack of media in the MCTs which were unable to remove extremely high levels of manganese in the raw water. No MCT checks had been undertaken recently and operators were unsighted as to the amount of media in the pressure vessels. In addition to this the interstage manganese monitor was wrongly sited and was measuring the manganese levels entering the MCTs, rather than on exit.

I am particularly disappointed in this incident as I audited Port Charlotte two months prior and in discussion with operations staff no issues regarding the manganese filters – or loss of media – were raised.

The event has been categorised as significant. Scottish Water has identified eleven 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.

