Drinking Water Quality Regulator for Scotland

Incident Summary

Craighead WTW Manganese failure 16 May 2018

DWQR Inspector:
William Byers

Event No. 9306

Event Category: Serious

On 17th May, 2018, the contact centre began receiving calls from consumers in Huntly reporting discoloured water. Over the next 12 days, a total of 37 contacts had been received indicating a significant consumer concern about water quality in the area. A final water sample taken from the treatment works on 16th May, failed the standard for manganese with a level of 54µg/l. Subsequent samples taken on 20th and 22nd May also failed with the highest value being 90.8µg/l. One sample failed the standard for iron with a value of 347µg/l and the turbidity standard with 1.4 NTU. An incident team was set up on 23rd May to co-ordinate actions to address the water quality changes and the operational and consumer response required within the water distribution network.

There had been an issue with the dissolved air flotation (DAF) system in the early hours of 16th May,which had been resolved but since there was ongoing consumer concern with the supply and a known manganese risk in the source, the incident team focussed on the water quality from the various water sources feeding into the raw water storage reservoir. This quickly established there was a problem with a spring source, and the pumped supply from the River Deveron, a significantly better quality water, was diverted to feed directly into the works. Steps were also taken to cease thereturn of supernatant water to the inlet of the works and tanker this off site. With these changes made, the frequency of consumer contacts reduced with five contacts being received on 24th and then two on 29th. Samples taken from points within the distribution system showed three failures ofthe manganese standard with the last being taken on 27th May. Thereafter, continuing monitoring showed the supply to meet the regulatory standards.

I consider the issues with the DAF plant on 16th May, to have been the root cause of the incident which were further exacerbated by the incapability of the treatment works to remove soluble manganese. A failure of a clear water pump providing the feed to the air saturator resulted in loss offlotation within the DAF system. The situation was resolved within 4 hours but as there is no facility to operate the works to waste, poor quality water was passed forward onto the filters and through into the clear water tank. The works final sample taken on 16th May, provided the initial failure for manganese indicating this to be the case and the first consumer contacts were received on the 17thMay, some 28 hours after the DAF process issue. A further alarm of high turbidity in the filtered water on 20th May, which initiated process investigations, showed elevated levels of manganese, aluminium, iron and turbidity, indicating there were continuing issues with the plant. Against the challenging raw water conditions, which had gradually been becoming worse over a period of 10 days preceding the DAF failure, I consider theses to be key in the initiation and prolonging of theconsumer water quality issues. The change to direct utilisation of the River Deveron source is recognised however as a significant measure in restoring water quality.

Manganese is present in the raw water supply into this works. Whilst evidence provided by Scottish Water indicates that the works has been able to produce compliant water during similar raw water conditions in previous years, I am concerned that the introduction of elevated levels of manganese into distribution systems increases the risk of discolouration of the water supply and future breachesof the standard at consumers taps

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