Technical Inspection of Scottish Water's Water Treatment Works

Balmore WTW

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Summary of Inspection

Overall Summary

Balmore WTW is a well operated site, and Operational staff involved in the audit displayed a good understanding of the operation of the treatment works. There were high standards of general housekeeping, records were easily accessed and well organised, and labelling of assets was excellent. At the time of the audit the quality of water being supplied was good, with all measured parameters well within regulatory standards.

It was noted that a number of scheduled tasks over a few weeks had not been completed due to a lack of resources, so it is recommended that staffing levels are reviewed. The Senior Operator and an Operator are working reduced hours in the run up to their retirement; and the recruitment process for their replacements is underway. The backwash of filter 506 was observed; there was an even pattern of air scour, there is a well designed system for returning the first flush post backwash to the head of the works, and examination of turbidity trends on SCADA showed that there were no adverse effects on filtered water turbidity before or after washing the filter. Other hydraulically linked filters in the bank showed no deterioration in turbidity during the backwash. Trends on SCADA were checked for aluminium residuals which were consistently very low, and raw water quality trends showed a relatively stable supply, despite variations of proportions of the different raw water sources. The site is well equipped with on-line and bench water quality instrumentation. Of concern however were the turbidity trends for filter 202, which showed unusual high spikes in turbidity before filter washes. These increases in turbidity were also observed in the combined filtrate turbidity trend from the four filters in the bank of filters. Site and process staff reported that they were aware of this and were carrying out investigations. Water quality trends showed that the treatment works dealt well with changes in raw water quality, but it was observed that in general there was a significant amount of operator intervention required to ensure the smooth operation of the treatment works.

Manual samples for free and total chlorine, aluminium and pH were taken by an Operator and were analysed using bench equipment. The Operator had a good working knowledge of the sampling and analysis techniques, and the results showed a good comparison with on-line instrumentation. Instrumentation was well understood at the site, and all service and calibration records checked were in date, apart from on-line chlorine monitoring; the servicing was out of date by one and a half months. Given the reliance on these monitors for the control and monitoring of disinfection, this is unacceptable, and it is recommended that a process it put in place to ensure that online monitoring is serviced in accordance with manufacturers' recommendations. All chemical reagents checked were in date.

Chlorine trends show that the site does not appear to manage the automatic changeover of the hypochlorite dosing pumps well, and it takes several hours for chlorine levels to stabilise. While the chlorine levels are well within the set limits for chlorine at the site, the lack of responsiveness of the system is of concern, and it is recommended that this is investigated by Scottish Water. Artificial alarms for low pH and chlorine were triggered at the treatment works to determine the response time of the Intelligent Control Centre (ICC) to alarms on a manned site. The ICC responded well, with a call to the treatment works received after 20 minutes (a 15 minute delay is reportedly built into the system to prevent spurious alarms being sent to the ICC).

The DWSP does not contain information on sources or catchments since they are recorded on the DWSPs for Blairlinnans and Milngavie, which share the sources, and there are separate DWSP for different parts of the network, but none of this is clear on the Balmore DWSP.