

Incident Assessment

Castle Moffat WTW Aluminium and Turbidity Failure 21st January 2014

DWQR Inspector:
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Event No. 5798

Event Category: Significant

Summary of Incident

At 0900 on the 21st January 2014 Scottish Power carried out planned work on the electricity network which caused a reduction in voltage to the electricity supply to Castle Moffat. The sludge and coagulant aid plants, but not other parts of the site, are fitted with undervoltage protection, and the drop in voltage caused the power to these parts of the works to be switched off, causing the pumps to fail. This led to a reduction in quality of water leaving the plant, and standards for turbidity and aluminium being exceeded in final water samples for a period of at least six hours before returning to normal. As there was no overall power failure the emergency generator was not activated.

To minimise the impact on the final water, there was a manual shutdown of the works, coagulant aid was dosed manually and the inlet to the clear water tank was temporarily bypassed, with water diverted to the sludge plant.

Manual turbidity samples of the final water measured 1.4 NTU (the PCV is 1.0 NTU), and manual aluminium samples measured up to 524µg/l (the PCV is 200µg/l). The online aluminium monitor at the plant, which would have provided a continuous record of aluminium concentrations, was not operational at the time of the incident.

Scottish Water has formally complained to Scottish Power about the lack of notification of work being carried out on the electricity network.

DWQR Assessment of Cause of Incident

The reduction in voltage to the coagulant aid plant caused the coagulant aid pumps to fail, resulting in a deterioration in final water quality as the coagulation process was compromised. Water quality was not restored for a period in excess of six hours.

DWQR Assessment of Actions Taken by Scottish Water

Scottish Water was not informed of work being carried out on the electricity network by Scottish Power and could not therefore have been expected to be prepared for a reduction in the voltage of the supply, and normal contingency arrangements for a total loss of power were not triggered. Scottish Water minimised the impact on the final water by manually shutting down the works, manually dosing coagulant aid and diverting the supply into the sludge plant, all of which undoubtedly helped the situation and enabled water quality to be restored as quickly as possible, although this took in excess of six hours.



Scottish Water took a number of samples from the treatment works and distribution system over the following three days, all of which were satisfactory. DWQR considers this to be an appropriate response.

At the time of the incident, the on-line aluminium monitor at the works was faulty, which meant that only manual samples were taken and analysed for aluminium, reducing the amount of information available to enable an understanding of the quality of the supply during the incident. Scottish Water has reported that the monitor failed on Saturday the 18th January, the manufacturer was contacted on Monday the 20th January, and the monitor was repaired on the 27th January, which DWQR considers to be reasonable.

The event has been categorised as significant. On the assumption that Scottish Water will maintain good lines of communication with Scottish Power so that they are aware of relevant service interruptions, no additional actions have been identified.

