

## Kyle of Lochalsh WTW *Cryptosporidium* detections June 2017

DWQR Inspector:  
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Event No. 8515

### Event Category: Significant

In May 2016, elevated microbiological results of the combined permeate (CP) from the ultrafiltration membranes at Kyle of Lochalsh WTW triggered daily *Cryptosporidium* sampling.

The elevated CP results obtained in late May prompted an investigation of one of the membrane stacks (T100), which was taken offline during this investigation, leaving the other two stacks (T200 & T300) in operation over the period of the *Cryptosporidium* detections (the works is designed to operate on 2 membrane stacks). Following the investigation the T100 stack was replaced with completely new membrane elements and returned to service on 20<sup>th</sup> June, however further CP failures were obtained from T100 on 26<sup>th</sup> June, 3<sup>rd</sup> and 7<sup>th</sup> July, and it was isolated until air integrity tests identified the three failing elements which were replaced. In addition, the T300 stack had CP failures on 5<sup>th</sup>, 12<sup>th</sup> and 20<sup>th</sup> June, and following integrity investigations a number of seals were replaced as a precautionary measure.

Over the period of these CP failures and investigations, positive *Cryptosporidium* results were found on 3rd, 4th and 5th June, with a further positive result on 12th June.

The membranes at Kyle were scheduled to be used until end of life. It is likely that the failure of membranes within the T100 stack was due to age related failure, and that the poor condition of the seals on the T300 stack was a contributory factor.

Scottish Water have considered that some *Cryptosporidium* oocysts may have remained in the limestone contact tank (LCT) and sample pipework after the removal of the defective T100 stack, and that these presented themselves over the next few days. This seems unlikely, as the WTW were working at full capacity over the busy summer period and any debris is likely to have been flushed through. However streaming of the CWT has also been identified during another incident at Kyle, and this may have contributed to the slow progress of the *Cryptosporidium* through the works.

It should be remembered that *Cryptosporidium* enumeration can be as low as 40% of the total amount, and thus a negative result is not conclusive proof that no oocysts are present.

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

