

## Monitoring for Protozoa in water

### ***EPA LT2ESWTR (one word) Long Term 2 Enhanced Surface Water Treatment Rule***

Under LT2ESWTR all Public water systems that use surface water or groundwater under the influence of surface water were required to participate in a second round of monitoring to document occurrence of *Cryptosporidium* for a period of two years starting in 2015. EPA Methods 1623.1 or EPA Method 1623 were used for detection *Cryptosporidium* oocysts and *Giardia* cysts. The purpose of the LT2 rule was to identify water sources having higher *Cryptosporidium* concentrations and to require control proportional to source concentrations. Cel Analytical performed *Cryptosporidium* and *Giardia* analyses for facilities in the California required to satisfy their LT2

monitoring requirement. Many facilities continue to monitor for *Cryptosporidium* and *Giardia* in their source water after the required two-year LT2 monitoring cycle. Cel Analytical stands committed to provide accurate results to our clients. We participate in inter-laboratory Proficiency Testing (PT) through Wisconsin State Laboratory of Hygiene (WSLH) twice/year (October and April) for *Cryptosporidium* and *Giardia* Testing (PT) and maintain Certification through State of California ELAP. Proficiency Test (PT) results and Certification are available to download.

*“Your laboratory’s effort to employ and train appropriate personnel to detect *Cryptosporidium* in source water is appreciated as we embark on the 2<sup>nd</sup> round of monitoring for the Long Term 2 Enhanced Surface Water Treatment Rule.”* Carrie Miller, US EPA *Cryptosporidium* Laboratory Technical Liaison

### ***WRF DPR-2\_EPA 1693 Modified for Detection of Parasite in Untreated Wastewater***

CA ELAP offers Field of Testing (FoT) 129 for analysis of Protozoa in Drinking water. No FoTs are currently available for untreated wastewater nor, the current acceptable EPA method 1693 developed for treated wastewater. The California State Water Resources Control Board (SWRCB) is in the process of developing regulations for direct potable

reuse (DPR) of municipal wastewater. A key element of this process is determining the level of treatment necessary to ensure that the product of a DPR operation adequately protects public health. To that end, the level of potentially harmful chemicals and waterborne pathogens must be defined so that the proper levels of treatment can be determined and reliably applied. The SWRCB along with The Water Research Foundation (WRF) has just completed a 14-month study (WRF DPR-2) on waterborne pathogens in untreated wastewater that allows the State staff to develop log reduction criteria for viruses, and protozoans (i.e. *Giardia* and *Cryptosporidium*) for DPR projects. The



Figure 1: comparison of RW and disinfected secondary treated wastewater.

concentration of a variety of viruses and protozoans were measured. However, due to the complex nature of untreated wastewater (see figure 1), currently accepted methods for pathogen detection had to be modified. As the testing for pathogenic protozoans is a field-of-testing (FOT 129) for CA ELAP in water, the modifications employed in the WRF DPR-2 study to EPA 1693 is useful for enumeration of protozoans in untreated wastewater. In the future, it may be necessary for CA ELAP to add to the current FoT 129 so that there are accredited laboratories conducting this crucial analysis for all types of potable reuse projects throughout the State, if not the nation.

The SWRCB-WRF DPR project required development and demonstration of procedure to provide reproducible measurement of Cryptosporidium and Giardia concentrations in raw sewage. Drawing on extensive prior experience applying EPA Method 1623, modifications were chosen including:

- Initial processing based on direct centrifuging 1 L of raw sewage (RWW)
- Measurement of recovery efficiency in every sample using Colorseed as matrix spike
- Addition of kaolin to stabilize concentrates prior to introduction of IMS beads
- Analysis of 4 ml pellets required 8 IMS aliquots per RWW sample
  - Assures cryptosporidium concentration measurement in all RWW samples
  - Colorseed™ Spike recovery provides for both quantification and quality assurance in every sample

For further information and sampling supplies contact the laboratory at (415) 882-1690 or reach us through the contact us page