Legionella

Australian Water Quality Centre

Analysis for:
Legionella

Limit of Reporting:
<10 cfu/1mL

Components:
L. pneumophila
L. species

Sampling Requirements:

- Sterile 600mL PET bottles, Sodium Thiosulphate dosed
- Air gap essential
- Transport & Store at 4˚C
- Transport in individual snap-lock bags
- Process within 6 hrs of collection (preferable), up to max 24 hrs (AS/NZS 2031:2001)
- For hot or warm water systems collect initial run of water from outlet

The AWQC is able to offer a rapid DNA- based Legionella assay.

Legionella and Legionnaire's Disease

The outbreak of pneumonia amongst American ex-servicemen attending a bicentennial convention in a Philadelphia hotel in 1976 resulted in the recognition and description of Legionnaires' Disease (Legionellosis) and the discovery of a bacterium later named *Legionella pneumophila*.

Legionella are common in industrial and environmental water sources, existing as part of biofilms or in sediments and are often found to co-exist with protozoa and ciliates. *Legionella* species are responsible for sporadic and outbreak cases of atypical pneumonia (Legionellosis) and a lesser form of infection known as Pontiac Fever, which is undiagnosed in many instances.

Efforts to control the spread of Legionnaire's Disease have primarily concentrated on stopping the potential of transmission by controlling the multiplication of *Legionella* in water sources. Chemical dosing of water sources is the primary measure employed, although there are other techniques available.

Methodology

Traditional: Current testing for *Legionella* relies upon the use of traditional methodology that is based on AS/NZS 3896:2008. The method isolates and enumerates *Legionella* species in water by the spread plate technique.

The sample of water is treated, inoculated onto specific media and incubated up to 7-10 days. Further tests are performed to confirm suspect *Legionella* like organisms. Confirmed Legionellae are identified as *Legionella* spp., *Legionella* serogroup 1 or serogroup 2-14 using rapid latex slide agglutination.

Rapid DNA Assay: The AWQC has developed a method that couples standard bacterial culture techniques with DNA technology to allow more rapid detection. Recently, the developed method was compared to the current standard method (AS/NZS 3896:2008) in an extensive field evaluation involving over 140 samples. The results indicate that the newly developed rapid method is as accurate as the standard method, but has a superior advantage in speed, with confirmed *Legionella pneumophila* counts available in as little as 3 days compared to 5-7 days by the standard method. These results have recently been published in one of the premier environmental journals, Applied and Environmental Microbiology.

Importance of the New Test

The greatest advantage of the rapid test is the speed at which results can be delivered. Typically, depending on species, the turn-around-time is reduced by at least 3-4 days. The delivery of a timely result will therefore aid in the administration of remedial action much sooner than previously possible and potentially stop contaminated sources continuing to spread *Legionella*. Additionally, because the assay tests the DNA of the bacteria, it is highly sensitive and specific and reduces the chances of reporting an erroneous result.

Legionella sampling in hot or warm systems in South Australia

Hot water systems have the potential to harbour *Legionella pneumophila* in places where there may be stagnant or warm water. Examples include shower nozzles, hot water taps, hot water storage vessels and hoses or filters attached to shower noses or tap outlets.

In 2008 The Department of Health released new regulations and guidelines for the control of *Legionella* and the management of hot and cold water systems.

The most significant change to the sampling regime for hot and warm systems (45˚C or greater) involves collection of samples prior to flushing.

Collect water into a sterile sample container (PET 600mL, Sodium Thiosulphate dosed) from the initial run of water from the outlet of the shower, bath tap or other outlet.

Note: Do not flush the outlet prior to collection (contrary to sampling for other microbiological examinations). Separate samples, collected after flushing are required if evaluating heterotrophic colony counts.

For further information, including definitions of hot and warm water systems, please refer to the Department of Health's *Legionella* web page:

http://www.dh.sa.gov.au/pehs/legionella-regulations-guidelines.htm

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