

**Legislative Council Commission
Meeting on 10 January 2012**

This paper reports on the discovery of the *Legionella pneumophila* in the Legislative Council (LegCo) Complex, relevant disinfection work, post-disinfection sampling, and investigation and further improvement measures.

Discovery of *Legionella pneumophila* at Tamar

2. On 21 December 2011, the Centre for Health Protection (CHP) was notified of a case of Legionnaire's Disease (LD) involving a 67 year-old gentleman working in the Central Government Offices (CGO) at Tamar. On 22 December 2011, apart from visiting the patient's home, CHP also visited the patient's office at Tamar and collected a total of five water samples for testing. On 28 December 2011, preliminary test results of the water samples obtained from the water tap of the patient's private toilet in his office suggested the presence of *Legionella pneumophila*, the bacteria that causes LD. As a precautionary measure, CHP collected a total of 38 water samples from CGO, Chief Executive's Office (CEO) and the LegCo Complex on 28 and 29 December 2011.

3. More specifically, the locations in the LegCo Complex from which water samples were collected were –

- (a) LG1 – main block potable water tank
- (b) LG1 – potable water tank for the dining room kitchen
- (c) LG1 – potable water tank for Cafe
- (d) 1/F – dining room kitchen sink tap
- (e) 3/F – pantry sink tap
- (f) 10/F – male toilet basin tap

4. On 2 January 2012, preliminary test results on the water samples obtained from nine locations at Tamar suggested the presence of *Legionella pneumophila*, including the tap water of the dining room

kitchen sink at the first floor of the LegCo Complex (location (d) in paragraph 3 above). On 5 January 2012, presence of *Legionella pneumophila* was also found in the water sample collected from the pantry sink at third floor (location (e) above).

Disinfection work

5. As soon as the preliminary test results of the first batch of water samples from CGO were known, the Administration arranged a thorough disinfection for CGO, which commenced in the evening of 30 December 2011 and completed in the early hours of 3 January 2012.

6. Soon after the preliminary test results of the water samples were known, the Administration also arranged a thorough disinfection on 3 January 2012 for the CEO, LegCo Complex, Tamar Café, the kitchen of the staff canteen on 1/F CGO and Tamar Park. The disinfection for all these areas was completed in phases with the last one finished on 8 January 2012.

Disinfection work in the LegCo Complex

7. The disinfection of the potable water system in the LegCo Complex covers the whole fresh water supply system in the building, including the water tanks, the plumbing system, all water taps and shower heads. The process commenced in the afternoon of 3 January, and completed in the early hours of 5 January 2012. The disinfection involved the following procedures –

(a) Water Tank Cleaning

The water in the water tank was firstly drained away and the tank was thoroughly cleansed inside by scrubbing with a solution of bleaching agent. The water tank was rinsed with fresh water thoroughly and refilled up again with fresh water;

(b) Shock Chlorination

Sodium hypochlorite was poured into the tank. By opening each and every water taps and shower heads, the sodium hypochlorite solution filled up all pipeworks and fittings of the plumbing system. The concentration of residual free chlorine of all the water draw-off points were checked to have a level of 50 PPM at the beginning and remain at a level of 30PPM for at least one hour. The chlorine levels were checked by the specialist contractor with measuring instruments; and

(c) Pipeworks Flushing

After the shock chlorination, all water taps and shower heads were flushed with fresh water until the residual free chlorine level dropped below 2 PPM to meet the World Health Organisation Guidelines for Drinking – water quality of not exceeding 5 PPM. The residual free chlorine level was checked by the specialist contractor with measuring instruments.

The staff of the Architectural Services Department (ArchSD) has supervised the whole disinfection process.

Post-disinfection sampling

8. Following the disinfection exercise, ArchSD, the Water Supplies Department (WSD) and CHP have conducted systematic post-disinfection sampling of water samples at CGO, LegCo Complex, CEO and the Tamar Park to ensure that Legionella bacterial count has returned to normal levels.

9. In particular, WSD collected seven water samples on 5 January 2012 from the following areas of LegCo Complex as requested by ArchSD for testing –

- (a) sump tank – supply water to LegCo Complex

- (b) sump tank – supply water to G/F Kitchen
- (c) sump tank – supply water to 1/F Kitchen
- (d) 1/F – store room tap
- (e) 1/F – kitchen tap
- (f) 3/F – pantry sink tap
- (g) 10/F – male toilet tap

The parameters of the samples tested include residual chlorine level, pH, apparent colour, turbidity, conductivity, iron, E coli, HPC and total coliform. The test results were found to be acceptable.

10. Eight post-disinfection water samples were taken on 5 January 2012 from the following locations of the LegCo Complex for testing of *Legionella pneumophila* –

- (a) 1/F – Dining Kitchen sink tap (2 samples)
- (b) 1/F – President’s office shower room basin tap (2 samples)
- (c) 1/F – President’s office shower tap
- (d) 3/F – pantry sink tap
- (e) 5/F – Gym Changing Room water tap 504a
- (f) 5/F – Gym Changing Room water tap 504b

11. In total, around 375 water samples of potable water were collected from the whole Tamar, including 161 water samples from the LegCo Complex taken from 5 to 9 January 2012, for further testing of *Legionella pneumophila*. Preliminary testing results would be available in five to six days and confirmed results in ten to 12 days from the date of water sample collection.

Other measures taken following the discovery of the *Legionella pneumophila*

12. Upon the discovery of the *Legionella pneumophila*, CHP has taken a number of measures to address concerns from the relevant parties and the general public. These include –

- (a) Issue of press release and conduct of press briefing to remind the members of the public to be vigilant about LD;
- (b) Distribution of health education leaflets and health advice on LD;
- (c) Set-up of a hotline service (2125 1122) for staff concerned;
- (d) Conduct of health talks for staff concerned; and
- (e) Arrangements made with Accidents and Emergency Departments (A&ED) under the Hospital Authority to facilitate people working in the LegCo Complex to seek medical consultation. This included, among others, a designated help desk at A&ED of Ruttonjee Hospital since 4 January 2012.

Probable causes on the presence of *Legionella pneumophila*

13. The design, materials, installation and testing of the whole water supply system in the Tamar are in compliance with the current legislation and in line with other government and private projects. Based on the current available test results, probable causes on the presence of *Legionella pneumophila* in the pipes can be identified as follows –

- (a) The majority of the water samples with positive *Legionella pneumophila* results are collected from outlets of low utilization, e.g. private toilets of the Directors of Bureaux and kitchen sinks infrequently used. The water in the water pipes connecting to these outlets is kept in stagnant condition for a long period. Stagnant water has a higher chance to become a medium for breeding *Legionella pneumophila*;
- (b) Hot water supply pipes in the fresh water supply system are insulated. Insulated pipework can keep warm water inside the pipe for a longer period of time. The amount of warm water

retained in pipework increases with the length of pipework between heater and water outlets; and

- (c) A combination of the two factors in (a) and (b) could provide a favourable breeding environment for *Legionella pneumophila* which grow well in water of 25°C to 40 °C. Therefore, water inside pipework connected to outlets of low utilization and with hot water supply could easily become breeding ground for *Legionella pneumophila*.

Preventive measure

14. For a preventive measure to minimize the risk on the presence of *Legionella pneumophila*, we propose to prepare housekeeping guidelines to advise building management and users on the need of regular cleansing and flushing programme for water taps and shower heads. In particular, hot water outlets which are infrequently used should be flushed for a period of time before use to reduce the stagnant water inside the pipework.

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