

Legislative Council Panel on Development
Visit to Singapore
Supplementary Information on
Ensuring Safety of Drinking Water in Hong Kong

1. This note is to provide information on the measures implemented by the Water Supplies Department (WSD) to ensure the safety of drinking water in Hong Kong.

A. Water Quality Standards

2. Safe drinking water is essential to the protection of public health. WSD has all along been taking the supply of safe drinking water seriously and striving to undertake it in a most professional and stringent manner.

3. Neither the Waterworks Ordinance (WWO), Cap. 102 nor Waterworks Regulations (WWR), Cap 102A specifies any standards on water quality. Notwithstanding, WSD has since 1994–95 pledged to supply drinking water to consumers in full compliance with the World Health Organisation (WHO)'s "Guidelines for Drinking-water Quality" (Guidelines) up to the connection points, i.e. the points between government water mains and the inside service (see Figure 1 below). On the other hand, the water quality at inside service depends on its proper construction, installation, etc. as well as regular maintenance and cleaning by consumers and agents.

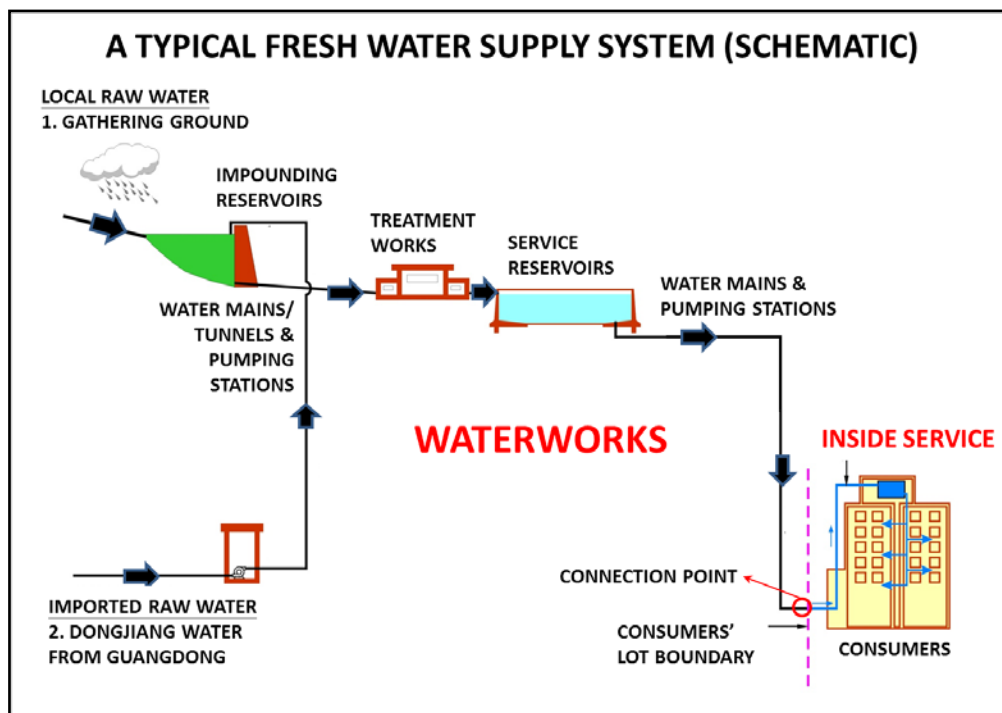


Figure 1, Schematic diagram of a typical fresh water supply system in Hong Kong

B. Water Quality Monitoring Regime and Water Safety Plan

4. WSD has developed a comprehensive and extensive water quality monitoring regime through a series of physical, chemical, bacteriological, biological and radiological examinations covering both WHO and some non-WHO parameters for operational monitoring and water quality surveillance. Against this, WSD takes more than 160,000 samples throughout the entire water supply system for testing each year. According to the monitoring results, WSD has all along been able to fulfil its pledge on treated water quality in full compliance with the Guidelines since 1994–95.

5. In the 2004 edition of the Guidelines, apart from updating the parameters, WHO introduced the Water Safety Plans (WSPs) which adopted a preventive risk management and multi-barrier approach from source, through water treatment and distribution system to consumers to assure the safety of water supply. WSP holistically identifies the actual and potential hazards in the water supply system, assesses the risk of each hazard and devises the mitigation measures, operational monitoring, critical limits and corrective actions as well as the verification of water quality as final check on the effectiveness of WSPs.

6. In accordance with the 2004 edition of the Guidelines, WSD developed its WSPs, from source through treatment and distribution system to connection points,

and started implementing them in 2007 to provide an effective and proactive mechanism in ensuring the safety of drinking water for the protection of public health.

C. Control of Water Quality at Source and Waterworks

Control of Water Quality at Source

7. The fresh water in Hong Kong comes from two sources, namely the local yield and raw water imported from Dongjiang (DJ) in Guangdong.

8. Legislation is in place to protect the local raw water source at the gathering grounds. WSD has also been controlling the development therein with a view to guarding against pollution.

9. With regard to DJ water, it has been stipulated in the water supply agreement that the water quality shall be of the “Environmental Quality Standards for Surface Water GB3838-2002” Type II standard. This is the highest national standard for surface water applicable for the abstraction for human consumption. To protect the quality of DJ water, the Guangdong authorities commissioned a dedicated aqueduct in 2003 and has been constructing sewage treatment plants in major cities along DJ. WSD has implemented 24-hour round-the-clock on-line water quality monitoring system, Biosensing Alert System and regular sampling to closely monitor the DJ water quality.

Control of Water Quality at Waterworks

10. WSD has strived to use advanced, stringent and comprehensive water treatment technologies to treat the raw water to a standard compliant with the Guidelines. Waterworks chemists will closely monitor each stage of the treatment process to ensure that the treated water is clear, wholesome and free from pathogenic bacteria. The monitoring is by means of on-line water quality monitoring systems as well as taking and analysing water samples at every stage of the treatment process.

11. Treated water is delivered to the connection points to consumers through an enclosed distribution system of service reservoirs and water mains. Apart from exercising material control in the construction stage, the distribution system will be thoroughly cleaned and disinfected before it is put into service. Furthermore, WSD regularly cleanses the service reservoirs and flushes the water mains at dead ends in

order to remove sediments to alleviate the impact on aesthetic quality of the treated water. Water samples are taken from the distribution system regularly for monitoring the water quality inside the system.

D. Control of Water Quality at Inside Service

12. In order to ensure the water quality in an inside service, every effort should be duly made in the construction and maintenance of the inside service.

Control of Construction, etc., of Inside Service

13. At the construction stage, the Water Authority (WA) follows the risk-based approach in accordance with the Guidelines to monitor and control the risk of contamination in the inside service by taking and testing water samples to control the risk of microbial contamination, and implementing material control measures to deal with the risk of chemical contamination.

14. WA as the regulator has stipulated the material standards for the inside services to ensure the water quality. Pursuant to WWR, every pipe or fitting used in inside service shall be of the British Standard (BS). Besides, the WWO also requires that the construction, etc., of inside service shall be undertaken by a Licensed Plumber (LP).

15. Moreover, every stakeholder should perform their own role to ensure that compliant materials are used in the inside services. These include having developers and contractors taking the responsibility to procure compliant materials, the developer/authorised person (AP)/contractor conducting proper supervision of the plumbing works during construction and the LP ensuring the use of compliant materials in the plumbing works. Such arrangement is in line with the WHO's recommendation and provides an effective and cost-effective way for material control.

16. Furthermore, WA requires the LP to certify that the materials used in the plumbing works are as prescribed in the WWR and to submit an inventory of pipes and fittings as required by the WA for seeking permission to commence the plumbing works. WA has also taken one step further to adopt a dual insurance approach on material control by requiring the AP, who in his established professional role are responsible for the overall construction work of the development, to certify that the materials used in the plumbing works are in full compliance with the WWR before

commencement and upon completion of the construction.

17. Upon completion of the plumbing works, WA will carry out inspection to check the works against the approved plumbing proposals and the inventory of pipes and fittings previously submitted. The site inspection of the WA primarily focuses on communal part of the plumbing system and inside service of some flats selected on a random basis. Furthermore, water samples will be taken from the inside service for testing. The test items include physical, chemical and bacteriological parameters¹ which are selected according to a risk-based approach. The above control measures are generally on par with those requirements and practices in other countries including the United Kingdom, the United States of America, Canada, Australia and Singapore.

Maintenance of Inside Service

18. Consumers and agents are responsible for maintaining and keeping the inside service clean under the WWO and WWR. Notwithstanding, WA has been implementing a multi-pronged approach over the years to assist proper maintenance of inside services. Major measures include:

- (a) Issuing various guidelines to provide advice regarding proper maintenance of inside service;
- (b) Launching the Fresh Water Plumbing Quality Maintenance Recognition Scheme in 2002, and upgrading it in 2015 to Quality Water Supply Scheme for Buildings – Fresh Water (Plus) in which the water sampling test has been extended to cover four heavy metals, viz lead, cadmium, chromium and nickel, and the scope of water sampling has been expanded to cover both communal and non-communal parts of the plumbing system; and
- (c) Continuous monitoring of the water quality of inside service by taking about 16 000 pairs of water samples at consumer taps annually for a series of physical, chemical and bacteriological examinations.

Water Supplies Department
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¹ The tests parameters include turbidity, colour, pH at 25°C, free residual chlorine, conductivity at 25°C, total coliforms, *E. coli*, heterotrophoc plate count, lead, cadmium, chromium and nickel.