

**DRINKING WATER SAFETY ADVISORY COMMITTEE**

**Action Plan for Enhancing Drinking Water Safety in Hong Kong**

On 21 September 2017, the Government announced the Action Plan for Enhancing Drinking Water Safety in Hong Kong (the Action Plan) which comprises the following components-

- (i) establishing drinking water standards and implementing an enhanced water quality monitoring programme (the Enhanced Programme);
- (ii) tightening up plumbing material control and commissioning requirements for new plumbing installations;
- (iii) developing the Drinking Water Quality Management System (DWQMS) of Water Supplies Department (WSD) and promoting Water Safety Plan (WSP) for Buildings;
- (iv) enhancing publicity and public education; and
- (v) developing a drinking water safety regulatory regime.

2. WSD has been supplying drinking water in full compliance with the World Health Organization Guidelines for Drinking-water Quality (WHO Guidelines) up to the connection points to the consumers (connection points). With reference to overseas practices and the advice from the International Expert Panel on Drinking Water Safety (IEP)<sup>1</sup> appointed by the Secretary for Development (SDEV), the Development Bureau (DEVB) and WSD have formulated the Action Plan which is detailed in the ensuing paragraphs to safeguard the drinking water quality from source to consumers' taps.

***i. Establishing drinking water standards and implementing an Enhanced Programme***

3. WSD has all along been making reference to the Guideline Values (GVs)/Provisional Guideline Values (PGVs) of the WHO Guidelines in monitoring the quality of drinking water up to the connection points. For the establishment of the Hong Kong Drinking Water Standards, WSD has engaged

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<sup>1</sup> The IEP was appointed by the SDEV in June 2016 to advise SDEV on the proposal of DEVB/WSD on drinking water safety.

an expert consultant to carry out a comprehensive review study on drinking water quality standards and methodologies of setting these standards in overseas jurisdictions<sup>2</sup>.

4. In view of the public concern over possible metal contamination in drinking water, the expert consultant has focused on the 12 metal parameters in the WHO Guidelines in the first stage of the review study<sup>3</sup>. Having taken into account the consultant's findings and IEP's advice, GVs/ PGV for the 12 metal parameters in the WHO Guidelines are adopted in the Hong Kong Drinking Water Standards. Nonetheless, IEP advised that a review on the aforesaid standards should be carried out when new information is available from WHO's revision of its Guidelines or when sufficient local data is available, say in three to five years' time, including the appropriateness to adopt standards beyond WHO Guidelines for certain parameters. Against this, IEP advised that the current water quality monitoring programme<sup>4</sup> of WSD be enhanced by collecting random water samples from consumers' drinking taps for testing six metals, viz. lead, cadmium, chromium, nickel, copper, and antimony, which could be present in the internal plumbing systems. The collection and testing of water samples have commenced in December 2017. Further, we will continue to complete the remaining stage of the review study on the non-metal parameters of the WHO Guidelines and seek endorsement of the Drinking Water Safety Advisory Committee on the standards to be adopted in the Hong Kong Drinking Water Standards for these parameters by the end of 2018; and in the interim the IEP has recommended that the corresponding GVs/PGVs in the WHO Guidelines could also be adopted in the Hong Kong Drinking Water Standards for these parameters.

5. With reference to overseas practices<sup>5</sup>, the number of water samples to be collected from consumers' drinking taps for testing the six metals should be calculated according to the population of the 18 District Council districts

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<sup>2</sup> They include two international organisations (viz. World Health Organization (WHO) and European Union (EU)) and seven overseas nations (viz. the United Kingdom (UK), United States of America (USA), Canada, Australia, New Zealand, Singapore and Japan).

<sup>3</sup> The next stage of the review study will be on the non-metal parameters in the WHO Guidelines.

<sup>4</sup> WSD has been taking water samples for monitoring from its waterworks including water treatment works, service reservoirs and from publicly accessible places such as shopping centres, clinics, community facilities, sports grounds, markets, government offices, estate management offices, etc.

<sup>5</sup> The sampling rates in UK are: one sample for population < 100; four samples for population between 100 and 4 999; and eight samples for population between 5 000 and 100 000.

(DCDs). Accordingly, about 670<sup>6</sup> premises will be randomly selected from over 2.9 million water accounts in the territory each year for collection of the water samples under the Enhanced Programme.

6. In regard to the sampling protocol for collection of the water samples from consumers' drinking taps for testing the six metals, the IEP has endorsed the adoption of a two-tier sampling protocol<sup>7</sup> involving the testing of stagnant water, namely (i) Tier 1 – Random Day Time (RDT)<sup>8</sup> sampling; and (ii) Tier 2 – 30-minute stagnation (30MS) sampling<sup>9</sup> for verification of exceedance found in the Tier 1 water sample, which will be tested in case of exceedance being found in the Tier 1 water sample<sup>10</sup>. If there is no similar exceedance in the Tier 2 water sample, there should be no metal contamination in the internal plumbing system of the concerned premises. As the internal plumbing system is safe, there is no further action required. If exceedance is found in both Tier 1 and Tier 2 water samples in a premises, it suggests possible contamination in its internal plumbing system and WSD will provide necessary advice and assistance to the affected premises<sup>11</sup>.

***ii. Tightening up plumbing material control and commissioning requirements for new plumbing installations***

7. As water quality from consumers' taps will be affected by their internal plumbing systems (including the materials used), the Action Plan includes strengthening the regulatory control of internal plumbing systems. WSD has implemented a number of measures on tightening up of plumbing material

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<sup>6</sup> Based on the latest population data published by the Census and Statistics Department in February 2017 for each DCD.

<sup>7</sup> Taking into account the findings of the review study of the water sampling protocols adopted in two international organisations (viz. WHO and EU) and several overseas nations (viz. UK, Germany, United States of America (USA), Canada, Australia, New Zealand, Singapore and Japan) for water quality monitoring.

<sup>8</sup> For RDT sampling, a 1L unflushed sample will be taken at random during normal working hours in daytime from a drinking water tap of consumer. No flushing will be carried out by the sampler before taking the water sample whilst the internal plumbing system may or may not have been used by the consumer before the sampling. Therefore, RDT samples involve taking unflushed samples with various stagnation times. The 4<sup>th</sup> Edition incorporating the 1<sup>st</sup> Addendum of the WHO Guidelines indicates that RDT samples reflect most truly the water that the consumer drinks.

<sup>9</sup> For 30MS sampling, the tap should first be flushed for 5 minutes and then stagnated for 30 minutes before a 1-L unflushed sample is taken.

<sup>10</sup> Tier-2 30MS water sample will not be tested if there is no exceedance found in the Tier-1 RDT water sample.

<sup>11</sup> In case of exceedance of the respective standards of the parameters being found in the two-tier water samples, WSD will notify the affected parties of the test results, provide information on the related health risks, and advise on possible mitigation measures and the follow-up actions.

control and management and training of licensed plumbers since 2015. Further, DEVB and WSD have commenced a legislative review in regard to the parties responsible for design, construction and maintenance of plumbing installations.

8. On the commissioning requirements for new plumbing installations, WSD has engaged the University of Hong Kong to develop a systematic flushing protocol to ensure adequately flushing of new plumbing installations (systematic flushing protocol) to reduce metal leaching from new pipes and fittings before the new plumbing installations are put into use, as new pipes and fittings will have higher metal leaching rate. Progressive steps have been taken to tighten up the commissioning requirements for new plumbing installations in stages : (a) starting with the mandatory requirement in July 2017 for applying the systematic flushing protocol to all new plumbing installations after obtaining approval for water supply and before occupation; (b) with the next stage of implementation in October 2017 involving a 6-hour stagnation (6HS) water sampling test for the new plumbing installation after applying the systematic flushing protocol; and (c) finally making the satisfactory 6HS water sampling test result a condition for approval of effecting the water supply for new plumbing installations in January 2018. In line with the Enhanced Programme, all six metals have been included in the water sampling test for new plumbing installations subject to review in due course when more test results are available. We will also review the aforesaid measures and consider if further requirements including the adoption 24-hour stagnation (24HS) water sampling test for new plumbing installations are necessary. We are also conducting a holistic review on the roles and responsibilities of the contractors, licensed plumbers and workers in plumbing works, including exploring the introduction of a registration regime for plumbing contractors in the Waterworks Ordinance (WWO) to undertake more complex and large-scale plumbing works. The amendments to the WWO will be carried out in phases.

### ***iii. Developing the DWQMS of WSD and promoting WSP for Buildings***

9. WSD has developed its own WSP following the WHO Guidelines to ensure drinking water quality from source to distribution. In regard to the internal plumbing systems, WSD has spelt out in the WSP its regulatory, monitoring and advisory role. The IEP acknowledged that WSD has generally followed the methodology advocated by the WHO in its development of WSP and considered that WSD should be responsible for the water supply chain

from source to distribution up to the connection point under the “WSP for WSD”, whilst building owners should be responsible for the internal plumbing systems (i.e. beyond the connection point) which should be taken care by the “WSP for Buildings”.

10. Notwithstanding this, WSD has engaged an expert consultant to review the WSP for WSD and provide advice on the development and promotion of WSP for Buildings. With reference to overseas experience and advice of the consultant on WSP for WSD, WSD has enhanced its WSP followed by establishing and implementing in July 2017 the DWQMS that has embraced its enhanced WSP. In addition, WSD has promoted the WSP for Buildings to building owners and property management agents as water quality might deteriorate within buildings due to, for instance, water stagnation at dead ends, ingress of foreign materials to the water storage tanks or lack of proper maintenance of the internal plumbing system. WSP for Buildings would provide a systematic and effective management tool for building owners and management agents to properly maintain and clean their internal plumbing systems and play a vital role in safeguarding drinking water quality in Hong Kong.

11. To assist building owners and property management agents in establishing and implementing WSP for their buildings on a voluntary basis, WSD has developed guidelines and templates for their reference. The guidelines and templates for general buildings and schools were promulgated in conjunction with the announcement of the Action Plan on 21 September 2017 after successful trials at several buildings and schools. WSD will continue to work on other specific buildings such as elderly homes and promulgate the corresponding templates in due course. WSD has been reaching out to stakeholders to encourage development and implementation of WSP for Buildings to safeguard the quality of drinking water in their buildings. In this connection, WSD has launched the Quality Water Supply Scheme for Buildings – Fresh Water (Management System) (QMS) in November 2017 which has combined the WSP for Buildings and the existing voluntary Quality Water Supply Scheme for Buildings – Fresh Water (Plus) (Q-Plus); and WSD would award certificates to buildings participating in the QMS to recognise the responsible parties’ efforts in enhancing drinking water safety.

#### ***iv. Enhancing publicity and public education***

12. The implementation of the Action Plan, notably the Enhanced Programme and WSP for Buildings, will require public participation and endorsement of building owners and property management agents. In addition, suitable advice should also be tendered to the public, including flushing before using the water from new plumbing installations for potable purpose, adopting a good habit of flushing drinking water taps which have not been used for a long time, purchasing WSD approved taps with a “General Acceptance” label etc.

13. After the announcement of the Action Plan on 21 September 2017, WSD has progressively rolled out the publicity and public education on the safe use of water through various channels such as dedicated webpages, leaflets, posters, television and radio Announcement of Public Interest (API), public seminars and briefings to different users/stakeholder groups including property management agents and operators of specific premises (such as kindergartens, welfare units, schools, etc.). WSD has held several seminars for the public and professional bodies to raise awareness of their members on the Action Plan, and organised discussion forums with operators of specific premises to promote the Enhanced Programme and water use tips.

14. As mentioned above, WSD has been reaching out to stakeholders to encourage development and implementation of WSP for Buildings to safeguard the quality of drinking water in their buildings. WSD held briefing sessions for property management agents on QMS in November 2017 and will continue the promotion work on WSP for Buildings.

#### ***v. Developing a drinking water safety regulatory regime***

15. On the front of developing a drinking water safety regime in Hong Kong, DEVB engaged consultants to study the water safety regimes of leading jurisdictions as well as to explore a suitable control framework for Hong Kong. DEVB has also set up an Inter-bureau/departmental Working Group on Water Safety Issues<sup>12</sup> which has reviewed the studies and considered that an office independent from WSD together with a regulatory mechanism should be

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<sup>12</sup> The work of the Working Group on Water Safety was completed in September 2017.

established to develop drinking water quality objectives, standards, and regulatory and monitoring controls. While further studies will be continued to explore the scope and details of the water safety regulatory regime, a dedicated team will be set up in DEVB to monitor the performance of WSD on drinking water safety. Furthermore, DEVB has set up this Drinking Water Safety Advisory Committee with members comprising academics, medical experts, etc. to give advice on various water safety issues. Taking into account the advice from Advisory Committee, DEVB will draw up a suitable drinking water safety regulatory regime.

**Development Bureau**  
**Water Supplies Department**  
**January 2018**