

The 2019 Annual Report on Drinking Water Quality in Hong Kong

**Development Bureau
Drinking Water Safety Unit
June 2020**

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Annex 1 – Monitoring of Drinking Water Safety in Hong Kong

Foreword

1. This report gives an account of the work of the Development Bureau (“DEVB”) and the Water Supplies Department (“WSD”) in enhancing drinking water safety in Hong Kong in 2019.

Monitoring of Drinking Water Safety in Hong Kong

2. The Government attaches great importance to drinking water safety with the prime objective of supplying wholesome drinking water to residents of Hong Kong at all times. While WSD has all along been taking up the role of the sole water supplier in the territory, supplying quality fresh water to over 99.99% of the population in Hong Kong, the Food and Environmental Hygiene Department (“FEHD”) with the assistance of other Government Departments¹ is responsible for monitoring the water quality of streams and wells² for potable use to the remaining about 0.01% of the population living in remote areas where mains water supply is not available.
3. Over the years, WSD has been supplying drinking water in full compliance with the World Health Organization’s Guidelines for Drinking-water Quality (“WHO Guidelines”). In September 2017, DEVB and WSD launched an Action Plan for Enhancing Drinking Water Safety in Hong Kong³ (“Action Plan”) to safeguard drinking water safety in Hong Kong.
4. To meet the rising public expectation on drinking water safety in Hong Kong, DEVB has set up a dedicated team, namely the Drinking Water

¹ Three Government Departments, viz. WSD, the Department of Health and Government Laboratory, provide technical advice and support to FEHD in monitoring the water quality of streams and wells.

² Most of stream and well systems are under the maintenance of the Home Affairs Department (“HAD”).

³ Following the lead-in-drinking water incident in 2015, the Action Plan comprising drinking water standards and enhanced water quality monitoring programme; water safety plans; plumbing material control and commissioning requirements for new plumbing installations; publicity and public education; and water safety regulatory regime was formulated to safeguard drinking water quality in Hong Kong.

Safety Unit (“DWSU”) headed by a Principal Government Engineer since November 2018 to undertake, amongst other aspects of work, the duties of overseeing the performance of WSD in respect of drinking water safety.

5. The main duties and responsibilities of DEVB, WSD and FEHD in monitoring drinking water safety in Hong Kong are listed in **Annex 1**.
6. DWSU adopts the following means to monitor the performance of WSD in respect of drinking water safety: –
 - (a) Examining the results of WSD’s water quality monitoring programme;
 - (b) Monitoring the implementation of WSD’s Water Quality Incident Management Plan; and
 - (c) Conducting audits on WSD’s Drinking Water Quality Management System.
7. DWSU’s observations on WSD’s performance in 2019 are summarised in paragraphs 15 to 16, 25 to 31, and 36 to 44 of this report.

Setting up of Drinking Water Safety Advisory Committee

8. In January 2018, the Government set up a Drinking Water Safety Advisory Committee (“DWSAC”) with members comprising academics and experts of related fields to advise DEVB on various drinking water safety issues including: -
 - (a) Development of a suitable regulatory regime for drinking water safety in Hong Kong;
 - (b) Review of Hong Kong Drinking Water Standards (“HKDWS”);
 - (c) Review of the existing policies and operational strategies/measures relating to drinking water quality as well as formulation of new policies and operational strategies/measures; and
 - (d) Worldwide concern on water quality and safety as well as the directions for any research in light of international practices,

trends and developments.

9. DWSAC has convened five meetings up till December 2019 and provided advice to DEVB and WSD to accomplish the following key tasks: -

- (a) Review of HKDWS and the associated water quality monitoring programme;
- (b) Establishment of an endorsement mechanism for updating/revising HKDWS;
- (c) Establishment of a monitoring mechanism⁴ over WSD's performance in drinking water quality;
- (d) Development of a suitable drinking water safety regulatory regime for Hong Kong; and
- (e) Enhancement of chlorination facilities in Water Treatment Works ("WTWs").

10. DWSAC started its second term in January 2020 and will continue to play an expert role in advising the Government on drinking water safety. It also serves as an impartial body to examine the Government's efforts in safeguarding drinking water safety in Hong Kong.

⁴ The monitoring mechanism includes conducting regular reviews of WSD's water quality reports, surprise checks by DWSU and third party audits by external auditors.

Hong Kong Drinking Water Standards

Review of Hong Kong Drinking Water Standards

11. In the wake of the lead-in-drinking water incident in 2015, the Government launched the Action Plan to safeguard drinking water quality in Hong Kong. One of the key components of the Action Plan was to undertake a comprehensive study with a view to establishing HKDWS.
12. The review study on HKDWS was conducted in two phases. In view of the public concerns over metal content in drinking water, WSD kicked start its first phase review study on 12 metal parameters in the WHO Guidelines (“the First Study”) for completion by 2017. The First Study confirmed that the corresponding Guideline Values (“GVs”)/Provisional Guideline Values (“PGVs”) of the 12 metal parameters in the WHO Guidelines were suitable for adoption in HKDWS. However, of the 12 metals, six (viz. antimony, cadmium, chromium, copper, lead and nickel) might be present in inside services of buildings. WSD therefore launched the Enhanced Water Quality Monitoring Programme⁵ (“the Enhanced Programme”) in December 2017 with a view to monitoring the presence of the six metals in drinking water at consumers’ taps as well as collecting sufficient water samples from consumers’ taps for three to five years before conducting a further review of the drinking water standards for the six metals.
13. Pending the review on the remaining non-metal parameters in the WHO Guidelines (“the Second Study”), the International Expert Panel on Drinking Water Safety⁶ (“IEP”) affirmed that their corresponding GV/PGVs in WHO Guidelines should be adopted as HKDWS for

⁵ Under the Enhanced Programme, a two-tier sampling protocol was adopted. This two-tier sampling protocol was endorsed by the International Expert Panel on Drinking Water Safety taking into account the findings of the review study of the water sampling protocols adopted in international organisations and overseas nations for water quality monitoring. It involves the sampling of unflushed water, viz. Tier 1 - Random Day Time sample, and Tier 2 – 30-minute stagnation sample for verification of exceedance(s) found in the Tier 1 sample.

⁶ The IEP was appointed by the Secretary for Development (“SDEV”) in June 2016 to advise SDEV on the proposals of DEVB and WSD on drinking water safety. The IEP was disbanded in May 2018 after completion of its work.

compliance monitoring in the interim. As a result, the Government announced in September 2017 that Hong Kong adopted the GVs/PGVs of the 92 parameters in the WHO Guidelines as HKDWS.

14. In mid-2018, WSD completed the Second Study in which the parameters that should be included in HKDWS were reviewed. In this study, the parameters were reviewed having regard to the likelihood of their occurrence in the drinking water of Hong Kong and their potential to cause adverse health risk. Accordingly, WSD drew up a proposed revision of HKDWS which was subsequently agreed by DWSAC. The revised HKDWS will be rolled out to dovetail with the phased implementation of the revised drinking water quality monitoring programme as deliberated in paragraph 17 below.

Monitoring of Drinking Water Quality

Summary

15. WSD submits water quality testing reports to DWSU on a quarterly basis and publishes the rolling 12-month water quality data on its website half-yearly. In 2019, WSD conducted over 26 000 sampling visits to take water samples for chemical, bacteriological, biological, radiological, trace organics and trace inorganics tests. A summary of the number of drinking water samples taken at different locations is given in Table 1 below. All test results showed 100% compliance with HKDWS.

Table 1 - Number of Drinking Water Samples taken at different locations in 2019

| | Water Treatment Works | Service Reservoirs | Distribution Network | PACTs ⁷ | Total |
|------------------|-----------------------|--------------------|----------------------|--------------------|--------|
| Chemical | 27 930 | 7 846 | 957 | 17 626 | 54 359 |
| Bacteriological | 956 | 7 832 | 945 | 17 610 | 27 343 |
| Biological | 58 | 0 | 0 | 0 | 58 |
| Radiological | 871 | 0 | 36 | 719 | 1 626 |
| Trace Organics | 1 196 | 4 | 578 | 578 | 2 356 |
| Trace Inorganics | 261 | 4 | 73 | 73 | 411 |

16. Besides, water samples were taken at consumers' taps of randomly selected premises under the Enhanced Programme⁸ as mentioned in paragraph 12 above. Visits to a total of 663 premises had been successfully made as at 31 December 2019. The test results are disseminated weekly at WSD's website. A summary of the test results is given in Table 2 below.

⁷ PACTs refers to publicly accessible consumers' taps which are consumers' taps used for drinking or food preparation purposes in non-domestic premises such as shopping centres, community facilities, clinics, management offices, government offices, etc. that are accessible for sampling by WSD without the need for obtaining prior written consent.

⁸ For testing six metals including antimony, cadmium, chromium, copper, lead and nickel.

Table 2 - Statistics of Monitoring Results in 2019 under the Enhanced Programme

| | Minimum | Maximum | Average | 95 th percentile | Standard Value | Compliance of water quality with HKDWS* |
|-----------------|---------|-----------------|---------|--------------------------------|-------------------|--|
| Antimony (µg/L) | <1 | <1 | <1 | <1 | 20 | ✓ |
| Cadmium (µg/L) | <1 | 2 | <1 | <1 | 3 | ✓ |
| Chromium (µg/L) | <1 | 3 | <1 | <1 | 50 | ✓ |
| Copper (µg/L) | <3 | 390 | 20 | 63 | 2 000 | ✓ |
| Lead (µg/L) | <1 | 19 [#] | <1 | 2 | 10 | ✓ |
| Nickel (µg/L) | <1 | 52 | 2 | 4 | 70 | ✓ |

[#] denotes exceedance in Tier 1 - Random Daytime (RDT) samples. Subsequent Tier 2 - 30-Minute Stagnation (30MS) samples were tested for verifying the exceedance of lead found in the Tier 1 samples and the results were found complying with HKDWS. The exceedance in the Tier 1 sample might be due to unduly long stagnation time before sampling or sporadic presence of metal particles in the sample.

* Compliance with HKDWS based on the Two-Tier Sampling Protocol

Review of Drinking Water Quality Monitoring Programme

17. In early 2019, WSD completed a review⁹ of its water quality monitoring programme with respect to the sampling location, frequency and protocol of each of the parameters in the proposed revision of HKDWS mentioned in paragraph 14 above and proposed a revised water quality monitoring programme. The revised water quality monitoring programme was discussed and agreed by DWSAC at its meeting on 4 November 2019. According to the review findings, the monitoring frequencies for some of the parameters in HKDWS would need to be increased. WSD will take on board these new monitoring frequencies in phases from 2020 to early 2022 under the revised water quality monitoring programme taking into account the time for procurement of additional equipment as well as development and validation of testing method specifications¹⁰.

⁹ The review will help enhance the effectiveness of WSD's water quality surveillance work against HKDWS.

¹⁰ Since the procurement of additional testing equipment is covered by the Agreement on Government Procurement of the World Trade Organization, the overall procurement procedure will take at least 6 months. Another 3 to 6 months will then be needed for shipping of the equipment from overseas. When the new equipment is received, the development and validation

Monitoring of *Cryptosporidium* oocyst and *Giardia* cyst (“C&G”)

18. Apart from monitoring all the parameters in HKDWS on a regular basis, WSD has also been monitoring the microbiological quality of drinking water in Hong Kong through collecting water samples for testing the presence of C&G according to international practices.
19. *Cryptosporidium* and *Giardia* are common intestinal protozoan parasites. C&G are potentially present in surface waters, ground waters and other media. They can survive for prolonged periods of time in cool and moist environments.
20. The Centre for Health Protection under the Department of Health (“DH”) also published a note on the review of Cryptosporidiosis in Hong Kong. The note is available at https://www.chp.gov.hk/files/pdf/cdw_v15_26.pdf. According to DH, there was an upsurge in the number of reported cases of detection of *Cryptosporidium* oocysts in patients’ stool samples between October and December 2018. As a result, WSD had stepped up the monitoring frequency of C&G at WTWs concerned from quarterly to monthly but no C&G was detected in the tested water samples. Since January 2019, the number of reported cases of positive *Cryptosporidium* oocysts in patients’ stool samples had come down to normal and therefore, WSD’s monitoring of C&G resumed normal. While the root cause of the aforementioned upsurge in the positive *Cryptosporidium* oocysts cases could not be conclusively identified, it was unlikely to be caused by drinking water.

of testing method specifications will take a further 6 to 9 months depending on the configuration of equipment.

Drinking Water Quality Incidents

Development of Water Quality Incident Management Plan

21. Occasionally, incidents occur that may impact the quality of drinking water supply.
22. In view of the ever increasing public expectation on WSD's performance in particular in dealing with water quality incidents¹¹, WSD carried out a review in 2018 and drew up a Water Quality Incident Management Plan ("the Plan") to deal with such incidents in a systematic manner.
23. The objectives of the Plan are, as soon as a drinking water incident comes to WSD's attention, to help WSD (i) assess expeditiously whether the water affected is still safe for consumption and the possible impact on water supply; (ii) decide necessary actions to be taken before resumption of water supply; and (iii) disseminate important information to relevant parties and consumers affected. The Plan delineates the roles and responsibilities of parties concerned and sets out the responsive operational procedures (covering the deployment of resources and implementation of actions) and communication plans having regard to the gravity of the incident.
24. According to the Plan, WSD should inform DWSU of any water quality incidents classified as notifiable cases¹² as soon as possible, via instant message (such as WhatsApp) or through email. DWSU will then

¹¹ Water quality incidents are events that may affect water quality including aesthetic qualities which may not be related to drinking water safety; cause concerns to persons and/or give rise to impact on health of persons to whom the water is supplied; and/or likely attract media publicity on drinking water quality.

¹² In deciding whether a water quality incident is a notifiable case or not, the gravity of the incident and the degree of impact on the community should be considered. Generally speaking, a water quality incident is classified as a notifiable case if it leads to occurrence of any one of the following situations: -

- negative impact on health and/or public confidence in the water supply;
- exceedance of drinking water standards;
- affecting localised area (e.g. whole estate or a number of building blocks) or even more extensive areas;
- attracting significant media attention, and/or
- concerns raised by local resident groups or parties.

oversee WSD's responses to such incidents to ensure appropriate follow-ups are implemented.

Water quality incidents handled by WSD in 2019

25. In 2019, there were two notifiable water quality incidents. These two cases were both related to aesthetic quality of yellowish water and black particles found in inside services due to WSD's operations at government's water mains. Since the two notifiable cases are of very similar nature and level of severity, one of them is briefly described below for reference.

Yellowish Water and Black Particles found in inside services at Park Central, Tseung Kwan O

26. In the evening of 8 April 2019, a contractor of WSD carried out a planned shutdown operation in order to facilitate installation of a pressure reducing valve to an existing 600 mm diameter steel water main at Tseung Kwan O. Upon completion of the works and on resumption of water supply at 7 am of 9 April 2019, the operation of some water valves in the network for resuming the water supply had stirred up deposits (comprising sediments and bitumen particles¹³) in a section of the said water main. Water with transient suspension of deposits due to resumption of water flow in water mains was then drawn into the nearby Park Central where about 11 000 residents were affected. According to the Plan, the incident should be regarded as a notifiable case which should be reported to DWSU promptly.

27. Upon receipt of complaints from the consumers, WSD attended the

¹³ Under normal circumstances, drinking water supplied by WSD is clear and colourless in appearance. However, when there is operation and maintenance on water mains involving opening and closing of valves, which will induce a change in the direction or speed of water flow in the mains, the sediments at the bottom of the water mains could be stirred up and then brought to the consumers. Bitumen was the most common internal protective lining material for large-diameter steel fresh water mains in the last century. The bitumen used had to comply with the requirements of British Standards BS4147, which precluded any harmful substance that might affect drinking water safety. Generally, the risk of the internal protective lining peeling off is not high. However, the possibility of localised tiny patches peeling off after long years of service cannot be ruled out. These bitumen particles may be stirred up from the bottom of the water mains and water with transient suspension of deposits due to resumption of water flow in water mains may be brought to the consumers.

scene and assisted the management office of Park Central to carry out flushing of the inside services and cleansing of the water tanks whilst arranging flushing of the government's water mains at fire hydrants nearby with a view to discharging the water with transient suspension of deposits that might have remained in water mains. At the same time, WSD took water samples from Park Central and confirmed that the water was safe for consumption.

28. In this incident, DWSU only received notification of the incident from WSD on 15 April 2019, a week after the incident had happened. WSD explained that the relevant staff were fully engaged to fix the water quality problem with a view to resuming normal water supply to the consumers concerned as soon as possible, and had overlooked the need to report the incident to DWSU in a timely manner according to the Plan. DWSU thus considered that WSD should enhance the staff awareness in respect of prompt reporting of incidents to DWSU in future. DWSU also considered that communication with the affected residents should be carried out in advance before the implementation of the works, and contingency plans should be formulated to deal with unexpected incidents for prompt actions, e.g. prompt inspection and cleansing of the affected inside services.

29. In order to tackle the bitumen particles in fresh water supply system holistically, DWSU supported WSD to commission a consultancy to study the problem, and to propose short term and long term strategies to resolve the problem. As an interim measure, DWSU learnt that WSD would install strainers or separators in strategic locations in government water mains to reduce the chance of bitumen particles from entering into consumers' inside services.

30. Apart from the two notifiable cases, there were 56 non-notifiable minor incidents in 2019. They were mostly complaints about drinking water quality such as odd smell or turbidity, etc. that had affected a single or several units. These cases were mostly related to inside services and the water quality had resumed normal when WSD staff arrived at the scene or after WSD staff dismantling, flushing and re-installing the water meters.

31. Overall speaking, DWSU considers that proper implementation of the Plan would facilitate WSD to handle water quality incidents systematically. In this connection, WSD had agreed to arrange regular training for their staff including the frontline staff to enhance awareness of the possible risks that would affect drinking water quality as well as the salient details of the Plan.

Audits of WSD's Drinking Water Quality Management System

32. In July 2017, WSD promulgated its Drinking Water Quality Management System ("DWQMS")¹⁴, which encompasses all the elements of its Water Safety Plan ("WSP")¹⁵ as recommended by WHO. DWQMS not only sets out the water quality policy and operational monitoring of the control measures in the drinking water supply, but also lays down a systematic plan for reviewing and auditing relevant procedures of WSD with a view to verifying conformity with the documented requirements of DWQMS and improving the system continually.

DWSU's Audit Strategy

33. As mentioned in paragraph 6 above, one of DWSU's duties is to carry out audits on WSD's DWQMS, which consists of both audits by third party and surprise checks.

34. The objective of the third party audits is to verify the extent of compliance of the requirements of DWQMS across various WSD functions and activities and to identify any areas requiring further improvements. To ensure the impartiality and credibility of the third party audits, external auditors with proven experience in management system and WSP audits will be engaged to form the audit team¹⁶. DWSU will arrange conducting a third party audit once a year which covers all major functions described in DWQMS. The frequency of the third party audits will be reviewed from time to time.

35. The surprise checks, on the other hand, provide a more focused auditing of specific critical processes as well as the progress of the follow-up action in respect of the improvement and corrective actions identified via WSD's internal audits, water quality incidents, etc. The checks

¹⁴ The DWQMS is a management system based on the Framework for Safe Drinking-water of the WHO Guidelines, which comprises health-based targets, WSP and surveillance to ensure drinking water safety.

¹⁵ WSD has developed and implemented its WSP since 2007.

¹⁶ The team will comprise ISO 9001 auditors and an overseas certified WSP auditor.

provide further assessment on the safety of drinking water in Hong Kong, which are carried out by members of DWSU with chemistry/engineering background as well as auditing knowledge obtained through attending certified ISO9001 lead auditor training. The DWSU members will also participate as observers during WSD's internal DWQMS audits. DWSU performs the surprise checks on a quarterly basis and will review its frequency from time to time.

(A) Third party audit

36. The first third party audit was carried out from 30 July to 12 August 2019. The audit adopted a risk-based approach to check if WSD's activities carried out between July 2018 and June 2019 were in conformity with the requirements as set out in WSD's DWQMS. Review of records, site visits and staff interviews were carried out in areas covering the whole water supply chain up to consumers' taps, and the Regions/Divisions/Units selected by the audit team are shown in Table 3 below:

Table 3 - Scope of third party audit in 2019

| Water Supply component | Regions/Divisions/Units audited |
|---|--|
| Water Resources | New Territories East Region |
| Water Treatment | New Territories West Region |
| Distribution | Kowloon Region Project Management Division |
| Waterworks Laboratories | Water Science Division |
| Customer Services | Hong Kong and Island Region |
| Material Testing Laboratory | Technical Support Division |
| Warehouse and workshop | Mechanical and Electrical Maintenance Division |
| Complaint handling, prosecution and internal audits | Special Duty Unit, Customer Telephone Enquiry Centre, Public Relations Unit, Prosecution Unit at Headquarters |

37. The audit revealed that the DWQMS document had met WHO's recommendations regarding Water Safety Plan. No non-conformity was found and six Areas for Improvement ("AFI") and 25 Observations

(“OBS”) were identified.

38. Key recommendations arising from the third party audit were as follows:

- (a) The awareness of the staff members of WSD and its contractors in respect of water quality aspects relating to their work should be enhanced by training;
- (b) There was limited prioritisation of WSD’s DWQMS internal audit findings and better prioritisation would assist in implementation of follow-up actions;
- (c) Overseeing of the DWQMS internal audit team was not clearly defined in DWQMS, e.g. through audit by other parties or additional internal auditing, and the procedure should be properly documented;
- (d) Site security control at WTWs for both contractor’s vehicles and personnel should be further enhanced.

39. The external auditors also recommended, *inter alia*, that WSD should extend the awareness of drinking water safety to its staff, contractors and consultants, which will benefit compliance by continuous improvement of the working processes and documentation to cover matters that might improve efficiency of checking (e.g. material traceability and specifications, alignment of water quality critical limits, routine housekeeping, cooperation with other departments, etc.). In addition, WSD could improve the customer complaint recording and consolidation and streamline document control of departmental instructions and circular letters.

40. In gist, the findings demonstrated that WSD’s staff are in general aware of the preventive and mitigation measures regarding the risks specified in DWQMS and have taken appropriate actions accordingly. Follow-up actions that required immediate action had been completed. DWSU would monitor the progress of follow-up actions in the coming third party audits and surprise checks as appropriate.

(B) Surprise checks

41. Three surprise checks were conducted in 2019 and the details are summarised in Table 4 below:

Table 4 – Surprise checks in 2019

| Surprise Check No. | Month in 2019 | Regions checked | Numbers of findings |
|---------------------------|----------------------|-----------------------------|----------------------------|
| 1 | April | Kowloon Region | 6 |
| 2 | July | New Territories East Region | 4 |
| 3 | October | New Territories West Region | 4 |

42. Key recommendations arising from the three surprise checks were as follows:

- (a) Documentation of the test and check records by WSD's staff and contractors should be enhanced or improved to facilitate efficiency of checking;
- (b) The setting of the guidelines for jar test¹⁷ should be reviewed for optimisation of alum dosing;
- (c) Housekeeping of monitoring equipment should be enhanced and calibration of on-line water quality analysers should be improved to reduce the downtime; and
- (d) Hard copy of some relevant procedural manuals at WTWs for ease of reference by operational staff should be provided.

43. In gist, the surprise checks had found that the activities, operations and processes of WSD were generally in compliance with the requirements stipulated in the DWQMS document. Based on the findings of the surprise checks, follow-up actions that required immediate action had been completed and WSD had agreed to take necessary improvement actions. DWSU would monitor the progress of follow-up actions.

¹⁷ Jar testing is a method of simulating a full-scale water treatment process, providing system operators a reasonable idea of the way a treatment chemical will behave and operate with a particular type of raw water.

Conclusion and Way forward

44. In conclusion, DWSU was content with WSD's efforts made in 2019 in assuring drinking water safety in Hong Kong as well as the department's positive responses to the audit findings arising from the surprise checks and third party audit conducted in the year.
45. DWSU will continue overseeing WSD's performance in respect of drinking water safety through the established monitoring mechanism. DWSU will also enhance connection with overseas authorities with regulatory and supervisory functions with a view to staying abreast of the latest international practice in relation to drinking water safety.
46. In the meantime, WSD is undertaking a holistic review of the prevailing Waterworks Ordinance (Cap. 102) and its Regulations (Cap. 102A) ("WWO/WWR") with a view to drawing up amendment proposals on several aspects, such as strengthening the control of the construction and installation of inside services and plumbing materials. Riding on WSD's holistic review, DWSU is considering incorporation of several other aspects for enhancing drinking water safety in Hong Kong into the amendment proposals, including the incorporation of HKDWS, the regulation of drinking water dispensers and fountains as well as extending the Water Authority's powers to ensure drinking water safety of inside service of buildings.

~ End ~

Monitoring of Drinking Water Safety in Hong Kong

1. The Development Bureau (“DEVB”), the Water Supplies Department (“WSD”) and the Food and Environmental Hygiene Department (“FEHD”) are the key government bureau/departments responsible for monitoring the drinking water safety in Hong Kong in different aspects:

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Development Bureau

- (a) To enhance public confidence on drinking water safety in Hong Kong, DEVB has set up a dedicated team, namely the Drinking Water Safety Unit (“DWSU”) to undertake, among other aspects of work, the duties of overseeing the performance of WSD in respect of drinking water safety. DWSU operates impartially and independently from the Bureau’s housekeeping team for WSD.
- (b) DWSU oversees and coordinates matters relating to revision of the Hong Kong Drinking Water Standards (“HKDWS”), including initiating review on a need basis with WSD’s support and advice/recommendations provided by the Drinking Water Safety Advisory Committee (“DWSAC”). DWSU will seek endorsement by the Secretary for Development for any revision to HKDWS.
- (c) DWSU reviews WSD’s water quality reports, which cover Dongjiang water, raw water and treated water to ensure compliance with HKDWS at consumers’ taps, on a quarterly basis. Although the reviews mainly focus on treated water, DWSU also looks into the quality of Dongjiang water and raw water which may have bearing on the quality of treated water.
- (d) DWSU monitors the operations of WSD in respect of drinking water safety from sources to consumer taps through regular surprise checks by in-house staff and third party audits by external auditors. DWSU also keeps track of follow-up actions by WSD on the recommendations from regular surprise checks and audits, if any, including revision of the department’s Drinking Water Quality

Management System (“DWQMS”).

- (e) DWSU examines the performance of WSD in handling water quality incidents in accordance with its Water Quality Incident Management Plan (“WQIMP”) as well as the corresponding improvement measures, if any, with a view to avoiding recurrence of incidents. Where necessary, DWSU may seek views from DWSAC on such incidents or engage external party for conducting further investigation.
- (f) DWSU monitors the performance of WSD in carrying out its duties under Waterworks Ordinance (Cap. 102) (“WWO”) in ensuring drinking water safety in inside services. DWSU also oversees WSD’s performance in taking forward administrative measures to enhance drinking water safety at consumers’ taps.
- (g) DWSU also liaises with the Food and Environmental Hygiene Department (“FEHD”) in monitoring the quality of small water supply, i.e. water drawn from streams and wells for potable use in remote areas where no mains water supply is available. When necessary, DWSU may examine the water quality data of streams and wells.
- (h) DWSU, with the advice from DWSAC and assistance of WSD, continues to review from time to time on the international development in relation to drinking water safety and steer WSD for making continuous improvement of its DWQMS.

Water Supplies Department

- (a) WSD strives to ensure drinking water safety from sources to taps to ensure compliance with HKDWS at consumers’ taps.
- (b) WSD adopts a risk-based management approach under the DWQMS to conduct monitoring and to implement control measures in the drinking water supply, i.e. from source through treatment, distribution to point of consumption, so as to ensure drinking water safety.
- (c) WSD reviews regularly the latest international development on drinking water standards, studies any drinking water quality incidents both locally and internationally, and makes

recommendations to DWSU, when necessary.

- (d) WSD sets out the specifications for the use of materials at government's new waterworks¹ to ensure drinking water quality. Besides, WSD ensures that the government's new waterworks are properly constructed and installed.
- (e) WSD implements control of plumbing materials, and construction and operation of inside services in accordance with WWO and by means of administrative measures to safeguard drinking water safety in inside services.
- (f) WSD will handle water quality incidents in accordance with its WQIMP. When there is a notifiable water quality incident², WSD will report it to DWSU promptly.
- (g) WSD regularly reviews and revises, as necessary, DWQMS and WQIMP. Besides, WSD takes appropriate measures to ensure awareness of the department's staff of the DWQMS and WQIMP.

Food and Environmental Hygiene Department

- (a) FEHD coordinates with other Government Departments³ to monitor the water quality of streams and wells for potable use in remote areas where mains water supply is not available and to take necessary measures when there is any exceedance in accordance with the Public Health and Municipal Services Ordinance (Cap. 132).
2. Head of DWSU shall report directly to the Secretary for Development and the Permanent Secretary for Development (Works) in discharging his/her daily duties. Where the case is related to water supply from streams or wells under the purview of FEHD, DWSU will liaise with FEHD for necessary follow up action.

¹ For example, government's new water treatment plant or new water mains.

² As defined in footnote 12 on page 9 of the main report.

³ Three Government Departments, viz. WSD, the Department of Health and Government Laboratory, provide technical advice and support to FEHD in accomplishing the task. When necessary, these Government Departments may provide advice/information to FEHD about the latest international practices in monitoring drinking water quality of streams or wells with a view to facilitating FEHD in devising monitoring regime.

3. In order to maintain public confidence over drinking water safety, DWSU will publish annually a report on its work as well as its observations over the performance of WSD in relation to drinking water safety.

- End -