

Drinking Water Safety Advisory Committee
Eighth Meeting

Date : 1 June 2021 (Tuesday)
Time : 2:30 p.m. to 5:30 p.m.
Venue : Conference Room 7, G/F, Central Government Offices,
2 Tim Mei Avenue, Tamar, Hong Kong

Minutes of Meeting

Members Present

Ir LEUNG Kwong Ho, Edmund	Chairman
Ir Dr CHAN Hon Fai	Vice Chairman
Dr CHUI Ting Fong, May	
Prof HO Kin Chung	
Mr HO Kui Yip, Vincent	
Ir Prof LO Man Chi, Irene	
Dr MA Yiu Wa, Anthony	
Ir TANG Ming Sum, Michelle	
Dr WONG Siu Ming, Raymond	
Dr WONG TAAM Chi Woon, Vivian	
Ir WONG Yiu Sun, Peter	
Mr LO Kwok Wah, Kelvin	Director of Water Supplies
Mr CHAU Siu Hei, Francis	Deputy Secretary for Development (Works) 3
Dr HO Ka Wai, Rita	Head, Non-Communicable Disease Branch, Department of Health (“DH”)
Mr KAN Yim Fai, Fedrick	Secretary Team Leader (Water Safety), Development Bureau (“DEVB”)

Members Absent with Apology

Dr CUNLIFFE David Anthony

Dr TO Kai Wang, Kelvin

Prof TSE Lap Ah, Shelly

In Attendance

Ms KWAN Kai Yin, Janice	Assistant Secretary (Water Safety) 1, DEVB
Mr CHOW Wo Ming, Leo	Project Assistant Secretary (Water Safety) 3, DEVB
Ms YEUNG Man Yan, Didi	Executive Manager (Water Safety), DEVB
Mr CHAU Sai Wai	Deputy Director of Water Supplies
Mr MA Hon Wing, Wilson	Assistant Director/Development, Water Supplies Department (“WSD”)
Mr CHEUNG Yip Kui, Rico	Chief Engineer/Technical Support, WSD
Mr CHOY Tak Yip	Chief Chemist, WSD
Mr YU Chi Wing, Albert	Senior Chemist/Water Quality (Standards and Monitoring), WSD

For Agenda Item 2 only

Mr LAM Kwok Chuen, Benny	Senior Engineer/Consultants Management 2, WSD
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Action by

1. The Chairman informed that some Members were unable to attend the meeting due to travel restriction under the COVID-19 pandemic. As a result, the meeting materials had been sent to them on 18 May 2021 for comments and their response would be presented by the Secretary under the respective agenda items.

2. The Secretary reported that DWSAC Paper No. 1/2021 concerning the analysis of the annual drinking water quality statistics under the Enhanced Water Quality Monitoring Programme (“Enhanced Programme”) in 2020 had been circulated to Members on 24 February 2021. In gist, the test results showed that all water samples collected from premises randomly selected under the Enhanced Programme in 2020 complied with the Hong Kong Drinking Water Standards

(“HKDWS”) in respect of the six metal parameters (viz. antimony, cadmium, chromium, copper, lead and nickel). He added that no comments had been received from Members on the paper, and the relevant statistics/analysis had been uploaded to WSD’s website.

3. The Secretary also reported that the Government had announced on 22 April 2021 the latest HKDWS and the collection of additional water samples from consumer taps for testing of residual chlorine and *Escherichia coli* (“*E.coli*”). He further shared that the Chairman had attended a television programme “日常 8 點半” of Radio Television Hong Kong on 25 May 2021 to talk about drinking water safety issues and the latest HKDWS, while Prof HO Kin Chung had also been present in the same programme to talk about drinking water resources.

Agenda Item 1: Confirmation of Minutes of the Last Meeting

4. The Secretary circulated the draft minutes of the last meeting (i.e. the seventh meeting) to Members on 4 February 2021 and no comment had been received. There being no further comment from Members at the meeting, the minutes were confirmed.

Agenda Item 2: Matters Arising from Last Meeting

5. In response to the Chairman’s request in the last meeting (paragraph 21 of the minutes of the last meeting), WSD had prepared DWSAC Paper No. 2/2021 for circulation to Members. The paper summarised the water quality parameters involved in the updates of the drinking water standards in overseas jurisdictions in 2020. The paper would be discussed under Agenda Item 4 below.

[Prof HO Kin Chung arrived at this juncture.]

6. Mr Benny LAM, Senior Engineer/Consultants Management 2 of WSD, briefed Members on the latest prioritization matrix for the replacement or rehabilitation (“R&R”) works of steel fresh water mains with potential bitumen lining detachment problem and the associated mitigation measures as supplemented in the post-meeting note of paragraph 12 of the minutes of the last meeting.

7. A Member enquired the schedule of R&R works programme for the high-

priority steel fresh water mains with a total length of 110 kilometres. Another Member was concerned about the impacts to the community arising from such large-scale R&R works and whether suspension of water supply would be needed in the course of the works. Mr Benny LAM replied that WSD had planned to implement the R&R works in phases with a view to minimising the potential impacts to the community. Subject to funding availability, the first package of R&R works comprising some 50 to 70 kilometres water mains of the highest priority was targeted to commence in 2023 for completion in about eight to ten years. He further explained that WSD would explore temporary shifting of water supply zones and/or laying of temporary fresh water mains in order to maintain water supply to consumers affected by the R&R works as appropriate.

8. With no further comments from Members, the Chairman concluded that the Government should take forth the planned R&R works as soon as possible.

Agenda Item 3: Updates on Implementation of Action Plan for Enhancing Drinking Water Safety in Hong Kong (“Action Plan”)

9. Mr TY CHOY, Chief Chemist of WSD, updated Members on the implementation of the Action Plan, with particular highlights on (i) the implementation progress of the revised water quality monitoring programme and the Enhanced Programme; (ii) WSD’s consultancy study on the review of systematic flushing protocol to evaluate the feasibility of adopting 24-hour stagnation (“24HS”) water sampling tests in commissioning new plumbing installations; and (iii) WSD’s publicity and public education work covering the promotion of voluntary General Acceptance Product Shop Scheme and the promotion video on protection of impounding reservoirs, water gathering grounds and catchwaters from pollution.

10. For the Enhanced Programme, Mr TY CHOY reported that collection of additional water samples at consumers’ taps for testing of residual chlorine and *E.coli* had commenced since 17 May 2021. By the end of 2021, three full years of monitoring data for the six metals would have been collected and WSD would conduct an interim review on their standard values in 2022 at the earliest according to the advice of the International Expert Panel on Drinking Water Safety (“IEP”).

11. A Member commented that the results from the Enhanced Programme continued to be satisfactory which supported confidence on the safety of Hong Kong’s drinking water supply. A Member enquired if the case with lead level of

12 µg/L in the Random Day Time (“RDT”) water sample and 5 µg/L in the 30-minute stagnation (“30MS”) water sample represented a problem in the internal plumbing system of the premises concerned and if WSD had carried out any follow-up investigation. Another Member echoed that cases with lead level of 5 µg/L in the 30MS water samples should not be taken lightly. In response, Mr Francis CHAU, Deputy Secretary (Works) 3 of DEVB, recapped that the principle and basis of the two-tier sampling protocol for the six metals had been fully deliberated and endorsed by the IEP. If there was no exceedance in the Tier 2 30MS water sample, it would be considered as complying with the HKDWS. The reason for exceedance in the Tier 1 RDT sample might be attributed to prolonged stagnation time before sampling or sporadic presence of metal particles. The premises concerned would be classified as unaffected by metal contamination. He added that participation in the Enhanced Programme was voluntary and in case of exceedance in the Tier 2 30MS water sample, WSD would notify and advise the registered consumer and occupier of the premises concerned and, if necessary, the property management agents to investigate and mitigate the cause of exceedance in their internal plumbing system. Mr Kelvin LO, Director of Water Supplies, drew Members’ attention that in the case of the European Union (“EU”), the mitigation measures to be adopted for exceedance of their new parametric value of lead of 5µg/L would depend on their practicality. He added that WSD would continue to collect data to facilitate reviews in the future. In addition, Mr TY CHOY pointed out that WSD would review the sampling protocol in the upcoming interim review of data from the Enhanced Programme.

[Ir Michelle TANG arrived at this juncture.]

12. In response to a Member’s enquiry on whether water samples had been collected from premises of the Housing Authority, Ms Janice KWAN, Assistant Secretary (Water Safety) 1 of DEVB, advised that under the Enhanced Programme, premises were selected randomly from all potable water accounts of the 18 district council districts (“DCD”) in Hong Kong and the sampling size was proportional to the population of each DCD. Mr TY CHOY supplemented that under this mechanism, water samples from premises of the Housing Authority had been collected and tested. Echoing with the Member’s view that it was important to conduct detailed data analysis with regard to the premises types, Mr Kelvin LO added that WSD had done such analyses amongst others and could share the results with Members in the next meeting.

WSD

13. In regard to results of the water sampling tests in the commissioning of new plumbing installations and WSD’s review of systematic flushing protocol to

evaluate the feasibility of adopting 24HS water sampling tests, a Member opined new plumbing installations subject to the systematic flushing protocol continued to yield positive testing results. Another Member stressed that WSD should ensure that the systematic flushing protocol had been properly refined before adopting the 24HS water sampling tests as commissioning requirement. A Member opined that the short soaking time in each flushing cycle and the use of multiple flushing cycles in the current systematic flushing protocol might hinder the formation of a protective layer on the inner surface of the new plumbing system. He further suggested (i) adopting a longer soaking time to facilitate the formation of the protective layer thereby minimising metal leaching, and (ii) pre-soaking pipe fittings before installation as they might not be soaked up sufficiently under the systematic flushing protocol. Echoing a Member's view, the Chairman reminded WSD to give due consideration to Members' comments and suggestions in formulating/refining operation details in the commissioning of new plumbing installations, and to consult stakeholders before taking on board the 24HS water sampling test as commissioning requirement. Whilst noting the Chairman and Members' suggestions/comments, Mr TY CHOI responded that WSD would optimise the soaking and flushing cycles under the ongoing consultancy study. Ms Janice KWAN supplemented that WSD was reviewing the systematic flushing protocol, and would consult stakeholders before adopting the 24HS water sampling tests as commissioning requirement.

14. For the implementation of Water Safety Plan for Buildings ("WSPB") and Water Safety Plan Subsidy Scheme, a Member opined that the measures taken by DEVB and WSD were effective. He was also impressed by the fact that 25% of Hong Kong households had already implemented WSPB. Another Member added that WSD should continue promoting the implementation of WSPB to further boost up the participation rate. Mr TY CHOY undertook that WSD would continue its effort on this front.

Agenda Item 4: Updates on Drinking Water Standards in Overseas Jurisdictions

(DWSAC Paper No. 2/2021)

15. Mr TY CHOY briefed Members on the updates made by overseas jurisdictions on drinking water standards in 2020, including the Drinking Water Directive ("DWD") of EU and the Guidelines for Canadian Drinking Water Quality ("GCDWQ") of Health Canada, as well as WSD's assessment and recommended follow up actions in respect of the changes made in the revised

DWD and GCDWQ. In gist, WSD recommended that (i) for those parameters (or with related parameters) that had already been included in the HKDWS, Surveillance List or Watch List, no follow up action would be taken; (ii) for the remaining parameters, they would be included in the Watch List; and (iii) for *Legionella*, the Prevention of Legionnaires' Disease Committee ("PLDC") would be informed of the new standard of EU for PLDC's advice on follow up actions, if any. WSD would inform the Committee of PLDC's advice in due course.

WSD

[Post-meeting note: WSD presented an information paper on "Introduction of a Parametric Value for Legionella in the Revised Drinking Water Directive of the European Union" to PLDC at its meeting on 7 June 2021. PLDC supported conducting a study to obtain baseline information of Legionella in the drinking water distribution system in Hong Kong via snapshot testing, and agreed that a risk-based approach should be adopted by collecting water samples for Legionella testing from consumers' taps with depleted residual chlorine (which had occurred more frequently between June and August). As health significance of the revised DWD's parametric value and its applicability to Hong Kong had not been established, it would not be used as a triggering level for remedial actions in the exercise. The snapshot testing results would be reported to PLDC for deliberation and for follow-up actions.]

16. A Member opined that the assessment made by WSD on the parameters concerned was comprehensive, and agreed with the inclusion/retention of endocrine disrupting chemicals and microplastics in the Watch List given the rising concerns in the world. He further enquired WSD how the parameters on the Watch List would be dealt with. Mr TY CHOY advised that a dedicated Radar group formed by WSD's waterworks chemists would keep track of the latest development of the parameters concerned. The Radar group would prepare a brief report on the development of the parameters concerned and WSD would take follow up actions where appropriate. Mr TY CHOY added that snapshot monitoring would be conducted for the parameters on the Watch List if there were testing services available in local or overseas laboratories, and for some parameters such as microplastics, the testing method and/or reference value were yet available.

17. In regard to the retention of chloramines in the Watch List despite its exclusion from the GCDWQ, a Member pointed out that chloramines was a disinfection by-product formed by chlorine reacting with ammonia, and enquired whether snapshots testing had been conducted on the level of chloramines or ammonia. Mr TY CHOY responded that judging from (i) the fact that chloramination had not been used in Hong Kong's water treatment works

(“WTWs”); and (ii) the slight difference between the levels of total and free chlorine¹ in the treated water samples, the level of chloramines, if any, should have been well below the previous Maximum Acceptable Concentration of 3.0 mg/L in GCDWQ.

18. A Member opined that the analysis of the revisions to EU’s DWD and GCDWQ made by WSD was sound and he was supportive of the recommended follow up actions. In particular, he agreed that the development of water safety plans for water-using apparatus was the preferred approach to manage *Legionella* risks (which had already been depicted in the Code of Practice for Prevention of Legionnaires’ Disease). He also shared some information on the revision of the World Health Organization’s Guidelines for Drinking-water Quality (“WHO Guidelines”). A number of forthcoming revisions to be included in the 2nd Addendum to the 4th Edition of the WHO Guidelines had been signalled by the release of new or revised background documents for chromium, iodine, organotins, tetrachloroethene, trichloroethene, microcystins, saxitoxins, anatoxin-a and cylindrospermopsins. In particular:

- (i) The background documents for microcystins and cylindrospermopsins had included both short term and lifetime guideline values;
- (ii) The background documents for asbestos, manganese and silver were being updated;
- (iii) The background document for nickel was under public consultation (retaining the existing guideline value of 0.07mg/L), and
- (iv) The second edition of the text on Toxic Cyanobacteria in Water had been published recently.

Noting that the above revision of the WHO Guidelines covered chromium and nickel which were parameters under the Enhanced Programme, the Chairman suggested WSD taking into account the ongoing revision of the WHO Guidelines in planning for the interim review of data from the Enhanced Programme.

WSD

19. The Chairman concluded that WSD’s recommended actions in DWSAC Paper No. 2/2021 for the parameters concerned were endorsed by Members.

¹ Combined chlorine = total chlorine – free chlorine. Combined chlorine indicates the amount of possible chloramines and other combined chlorine compounds in drinking water.

Agenda Item 5: 2020 Annual Report on Drinking Water Quality in Hong Kong (“Annual Report”)

20. Ms Janice KWAN and Mr Leo CHOW, Project Assistant Secretary (Water Safety) 3 of DEVB, briefed Members about the Annual Report issued by the Drinking Water Safety Unit (“DWSU”) of DEVB, which would be published at DEVB’s website after the meeting.

21. The Chairman noted that the third party audit had been postponed for some time as the overseas certified Water Safety Plan auditor could not come to Hong Kong due to the COVID-19 pandemic. In light of the uncertainty of the pandemic, the Chairman enquired whether DWSU would consider carrying out the third party audit without the presence of the overseas auditor or increasing the frequency of DWSU’s surprise checks. Ms Janice KWAN responded that the third party audit was required to be carried out with the overseas technical specialist whose qualification and experience on auditing water safety plan could not be found locally. She also pointed out that the scope and purpose of the surprise checks were different from those of the third party audit, and hence the two audits could not replace each other. She supplemented that DWSU considered the existing frequency of surprise check adequate, and affirmed that the third party audit would be conducted once the overseas auditor could come to Hong Kong.

22. Members noted DWSU’s observations on WSD’s performance in respect of drinking water safety in 2020, and in general acknowledged the effort of WSD in ensuring drinking water safety. A Member opined that the 2020 Annual Report on Drinking Water Quality in Hong Kong demonstrated good management of drinking water safety by WSD. In particular, the results from the drinking water quality monitoring programme demonstrated full compliance with HKDWS. The responses to the limited number of water quality incidents were sound while the outcomes of the surprise checks by DWSU were generally satisfactory.

23. In respect of the water quality incident regarding the yellowish water found in fresh water supply in Kwai Chung and Tsuen Wan, a Member asked if WSD had carried out risk assessment in other WTWs to avoid recurrence of similar incidents and whether the guidelines on cleansing frequencies had been implemented. Ms Janice KWAN responded that WSD had already reviewed the cleansing frequencies of relevant facilities in other WTWs and provided clear guidelines to the operation staff. In response to another Member’s enquiry on whether WSD could implement works to overcome similar operational constraints in other

WTWs, Mr Kelvin LO advised that WSD had reviewed the facilities in other WTWs after the water quality incident and enhanced the relevant operation and maintenance to prevent recurrence of similar incidents.

24. For the water quality incident relating to the misconnection of salt water mains to the fresh water network, a Member opined that merely giving warnings to the contractor and staff concerned might not be adequate in preventing similar incidents from occurring. On the other hand, the recommended remedial action on exploring the feasibility of using different colour pipe materials to differentiate fresh water pipes and salt water pipes would take very long time to materialise even if it was eventually successful. WSD should look into possible systemic enhancement to reduce the chance of human faults. Ms Janice KWAN responded that while the incident was due to non-adherence to established guidelines/procedures by the staff and contractor concerned, WSD had made prompt enhancement to the relevant work procedures in their departmental instructions and Member's suggestions would be duly observed in the continual improvement of the department's daily work.

[Post-meeting note: The study on the use of different colours for fresh and salt water pipes was being carried out for completion in around Q3 2021. If found feasible, such measures would be adopted for new installations and R&R works, providing systemic differentiation of various types of water pipes in the long run.]

25. In response to a Member's enquiry on the incident of black particles found in the fresh water inside services, Ms Janice KWAN explained that WSD had engaged a consultant to carry out a study on the detachment of bitumen lining with details reported in Agenda Item 2 of this meeting. As a long-term strategy, WSD would replace and rehabilitate fresh water steel pipes with risk of detachment of internal bitumen lining, and the risk would be determined through the fire hydrant surveys. In the meantime, WSD would continue installing strainers at strategic locations of government water mains as well as carrying out regular cleaning of strainers and flushing of fresh water distribution networks. Moreover, WSD had provided technical advice to the buildings affected by the incident on cleaning their internal plumbing system.

26. Two Members suggested WSD exploring suitable digitalisation to minimise the chance of missing records or other human errors. Another Member noted the potential resource constraint and suggested digitalisation be adopted for critical steps to facilitate senior staff's monitoring and authorisation of work processes. Mr Kelvin LO responded that WSD had adopted digital supervisory system in new

works projects.

27. In response to a Member's enquiry, Mr Leo CHOW advised that the findings from the surprise checks were classified into (i) non-conformity; (ii) opportunity for improvement; and (iii) observation. WSD had been requested to submit their plan of follow up actions to DWSU within one month after the surprise check.

28. A Member enquired the governance of the stream/well water used in remote areas and whether DWSU got hold of their water quality statistics. Ms Janice KWAN replied that the Food and Environmental Hygiene Department ("FEHD") monitored the water quality of streams and wells for potable use regularly with the assistance of other Government Departments including WSD, Government Laboratory and DH. If the sampling results were found unsatisfactory against the prescribed quality parameters, FEHD would conduct investigation and post up notices to advise local villagers, as well as bring the case for the attention of other relevant government departments. DWSU would keep communicating with FEHD and other government departments concerned in monitoring the quality of small water supply.

[Mr Peter WONG left at this juncture.]

Agenda Item 6: Summary on International Water Quality Incidents

29. Mr TY CHOY gave a brief report on WSD's review on major international water quality incidents for the period from July 2020 to January 2021. Among them, four incidents were more relevant to Hong Kong and Mr TY CHOY explained that their risks of occurrence in the local context were low. A Member suggested WSD make use of the incident in Singapore with odour detected in drinking water supply relating to the use of unsuitable sealant in the repair of the water tank to remind local practitioners the importance of using compliant materials in plumbing works. In regard to the incident relating to *Naegleria fowleri* (an amoeba), a Member shared that it was a species present in raw stream water, though its presence was unlikely in Hong Kong. He pointed out that *Naegleria fowleri* might not be killed by chlorine but agreed with Mr TY CHOY's remark that the filtration in WTWs could effectively remove such amoeba from raw water, if any. Mr TY CHOY added that amoeba had not been detected in Hong Kong's drinking water so far.

WSD

Agenda Item 7: Any Other Business

30. The Chairman raised that as Japan had planned to discharge radioactive wastewater from the Fukushima Daiichi Nuclear Power Plant (“Fukushima Plant”) into the sea, the Committee should pay attention to the developments of the event in considering the future seawater desalination in Hong Kong. Mr TY CHOY responded that, currently, Japan’s planned discharge of radioactive wastewater should have no impact on the safety of drinking water in Hong Kong as only raw water from Dongjiang and local rain water were drawn for drinking water supply. As the Tseung Kwan O desalination plant would be commissioned in 2023 tentatively, WSD would keep in view the development of the event and assess the impact of the radioactive discharge from the Fukushima Plant so that appropriate monitoring and operation plan of the desalination plant would be drawn up. A Member shared that as the prevailing sea current near Fukushima was predominantly not drifting towards Hong Kong, the impact of the discharge would likely to be insignificant.

31. The Chairman announced that the next meeting, which would be the last meeting of the second term of the Committee, was scheduled to be held in November 2021 tentatively.

32. There being no other business, the meeting adjourned at 5:30 p.m.