

Advisory Committee on the Quality of Water Supplies
Minutes of Meeting No. 13

Date: 25 August 2005 (Thursday)

Time: 2:40 p.m.

Venue: Conference Room, 48/F, Immigration Tower, Wan Chai, Hong Kong

Members Present

Mr. FANG Hung, Kenneth	Chairman
Mr. KO Chan Gock, William	Vice-Chairman, Director of Water Supplies
Ms. CHEUNG Lai Ping, Lister	The Conservancy Association
Prof. HO Kin Chung	Open University of Hong Kong
Mr. WONG Kwok Keung	Hong Kong Plumbing and Sanitary Ware Trade Association
Mr. CHEUNG Yan Hong	Association of Engineers in Society Ltd
Dr. CHAN Hon Fai	Cinotech Consultants Limited
Prof. CHEN Yongqin, David	The Chinese University of Hong Kong
Ms. LEE Yoke Shum, Sam	World Wide Fund for Nature Hong Kong
Dr. NG Cho Nam	The University of Hong Kong
Dr. TSE Lai Yin	Head, Surveillance and Epidemiology Branch, Department of Health
Dr. CHIU Tak Lun, Michael	Assistant Director, Environmental Protection Department
Mr. SIN Kwok Hau	Assistant Director, Food and Environmental Hygiene Department
Mr. WONG Bay	Assistant Director, Housing Department
Mr. HEUNG Yuk Sai, Norman	Chief Assistant Secretary, Environment, Transport and Works Bureau
Mr. LAU Chi Ming, Stephen	Secretary, Senior Engineer, Water Supplies Department

Members Absent with Apologies

Dr. LAM Ching Choi	Haven of Hope Christian Service
Mr. LAW Wei Tak, Victor	The Hong Kong Federation of Electrical and Mechanical Contractors Limited
Prof. TSO Wung Wai	The Chinese University of Hong Kong
Ms. CHEUNG Mui Seung, Emily	North District Council
Ms. LEE Ying, Robena	Tuen Mun District Council
Mr. WONG Kwok Hay, Samuel	Wong & Fok Solicitors
Dr. WONG Yee Him, John	Kowloon City District Council

In attendance

Mr. CHAN Chi Chiu	Deputy Director, Water Supplies Department
Mr. NG Mang Tung, Bobby	Assistant Director, Water Supplies Department
Ms. HO Suet Mei, Daisy	Chief Chemist, Water Supplies Department
Mr. TAM Yat Hung	Senior Engineer, Water Supplies Department
Mr. CHAN Shu Key, Charles	Senior Engineer, Water Supplies Department

In attendance for Item 4 only

Mr. CHAN Ho Yan, James

Mr. Tom Pankratz

Director, CH2M – IDC Hong Kong Limited

Desalination Specialist, CH2M – IDC Hong Kong Limited

- | Item | Action | |
|------|--------|--|
| 1. | | The Chairman welcomed everyone for attending Meeting No. 13 of the Advisory Committee on the Quality of Water Supplies (ACQWS). In particular, he welcomed <u>Mr. HEUNG Yuk Sai, Norman</u> and <u>Mr. SIN Kwok Hau</u> who stood in respectively for <u>Mr. CHAN Shiu On, James</u> and <u>Ms. LO Yuet Yee, Rhonda</u> , of the Environment, Transport and Works Bureau, and the Food and Environmental Hygiene Department, as they were not available to attend the meeting. It was also the first time that <u>Mr. HEUNG</u> attended a meeting of the ACQWS. |
| 2. | | The Chairman also extended his welcome to the representatives from the Water Supplies Department (WSD) and, in particular <u>Ms. HO Suet Mei, Daisy</u> , the successor to <u>Mr. CHEUNG Tze Leung</u> , the Chief Chemist of WSD, who had retired since July 2005, and <u>Mr. CHAN Shu Key, Charles</u> , who was attending a meeting of the ACQWS for the first time. The Chairman again expressed his thanks to <u>Mr. CHEUNG Tze Leung</u> for his contribution in the past. |
| 3. | | The Chairman advised that two representatives from the Consultants, CH2M-IDC Hong Kong Limited (CH2M), were invited to present the preliminary report on desalination pilot plant study. He suggested discussing this item first. |
| 4 | | Desalination pilot plant study |
| 4.1 | | WSD briefed Members on the progress of the study. He advised that a preliminary study report had been completed in July 2005, which the Consultants would present later in this meeting, and that a site visit to the pilot plant in Tuen Mun would be organized for Members in September/October 2005. After that, he introduced and called upon the representatives from the Consultants to present the preliminary study report.

(<u>Mr. CHAN Ho Yan, James</u> and <u>Mr. Tom PANKRATZ</u> joined the meeting at this juncture.) |
| 4.2 | | CH2M presented the technical details of seawater reverse osmosis (RO) desalination, the pilot plant study objectives and tasks. He then presented the preliminary findings as summarized below:-
a. All pre-treatment systems and RO membranes being tested at |

the Tuen Mun Pilot Plant were found to be technically feasible for use under Hong Kong conditions.

- b. However, there were differences amongst the systems in terms of capital and operating cost (e.g. chemical and power consumptions), and hence the overall unit production cost of desalted water.
- c. Selection of the pre-treatment technology for a full-scale plant would need to consider site-specific constraints (e.g. space availability).
- d. For a full-scale plant capable of producing 50 million cubic metres (mcm) annually, the estimated capital and annual recurrent cost were about \$2.5-2.7 billion and \$182-199 million respectively. These figures were essentially preliminary as the systems were not fully optimized. The construction cost of the RO plant and the energy cost would be the major portion of the capital and recurrent cost respectively.
- e. The unit production cost would be about \$7.8-8.4 at 4% discount rate and \$6.4-7.0 at 0% discount rate.

4.3 CH2M informed the meeting that the Tuen Mun Pilot Plant would continue to be run until December 2005 to further optimize the systems and refine the cost estimates. The plant would then be relocated to Ap Lei Chau in early 2006 for further study.

4.4 The Chairman asked whether there were differences between the quality of water produced using the three different pre-treatment technologies and the three different RO membranes. CH2M replied that different combinations would definitely have different performance. However, it was important that the water produced from all the combinations complied with the requirements of WSD and Guidelines for Drinking Water Quality of the World Health Organization.

4.5 A Member questioned the differences in the land requirement of the various combinations for full-scale plant. CH2M answered that different pre-treatment technologies had different land requirements and the microfiltration/ultrafiltration systems could achieve a 20% reduction of land requirement as compared with a conventional granular media filtration system. However, he pointed out that apart from land requirement, there were other important criteria for choosing the pre-treatment technology. These included the quantity of the water produced per unit area, the quality of pre-treatment, possible extension of RO membrane life, the durability of the pre-treatment materials adopted, the quality of seawater and the site conditions.

- 4.6 **Two Members** asked if the consultants would recommend the specific technology to be adopted for the full-scale plant. **CH2M** replied that the current focus of the pilot plant study was not so much to recommend a specific technology but to study the performance of different options of combinations under different seawater conditions. **CH2M** added that the systems were still being optimized. As there were numerous variables affecting the design for the full-scale plant, it would not be appropriate to recommend the plant design at this stage.
- 4.7 **A Member** asked whether the consultants would make reference to the Singapore experience. **CH2M** advised that the plant in Singapore was still under construction although it was scheduled to be commissioned in the next few weeks. He said that Singapore had also carried out the pilot plant study on desalination adopting dissolved air floatation (DAF) units followed by granular filters for pre-treatment. He added that for the full-scale plant, Singapore adopted DAF units and single stage filters, with provision for extension to two stage filters. He commented that there were similarities and disparities between Singapore and Hong Kong conditions, and it would be desirable and likely enlightening to pay attention to the development in Singapore.
- 4.8 The Vice-Chairman enquired whether there were any pores in the RO membrane, whether the water existed in forms of ions (H^+OH^-) or molecules (H_2O), and whether the sodium chloride existed in forms of ions (Na^+Cl^-) or molecules (NaCl). **CH2M** replied that there was no hole or pore in the RO membrane, as desalination was a diffusion process rather than a physical straining process. In fact, there was still a debate on this subject. However, he was not sure about the answers for the second and the third questions, but he believed that water and sodium chloride could exist in both forms simultaneously. The Vice-Chairman questioned if it would be appropriate to differentiate between a suspension and a solution according to the size of particles in a suspension. If something was bigger than a virus, it was a suspension. A solution could pass through holes whereas the large particles in a suspension would be trapped by membranes with pores. **CH2M** agreed that this would be a good way of looking at the question.
- 4.9 **A Member** asked what could be done to make the water more tasteful. **CH2M** answered that post treatment by adding appropriate chemicals or blending would be required to cope with the taste problem and also corrosion problem as well.

- 4.10 **A Member** questioned about the salt content of the concentrate returned to the sea after desalination and the consequent impact on marine lives. **CH2M** responded that the salt content of the concentrate was usually 1.7 to 2 times that of the seawater. Some species of fish might, of course, be affected. It would be desirable that the concentrate could be diluted or blended as quickly as possible with treated effluent from wastewater treatment plants or cooling water from power plants or buildings. Apart from that, the outfall method using diffusers to quickly mix the concentrate with seawater could minimize the impact on the seawater environment. He added that marine lives in the surf zone were generally more flexible and adaptable to changes in the environment as they were regularly subject to tidal fluctuations, temperature variations, etc.
- 4.11 **A Member** asked about the normal practice in the distribution of desalted water. **CH2M** answered that generally desalted water after post-treatment would be mixed with water in the existing system before distribution. This also helped to stabilize the desalted water and resolve the taste problem. However, different countries had different practices to suit their own situations.
- 4.12 As there were no further questions, the Chairman thanked Mr. CHAN Ho Yan, James, Mr. Tom PANKRATZ and Mr. CHAN Shu Key, Charles for their participation in the meeting.
- (Mr. CHAN Ho Yan, James, Mr. Tom PANKRATZ and Mr. CHAN Shu Key, Charles left the meeting at this point of discussion.)
5. Agenda Item 1 : Confirmation of Minutes of the Last Meeting
- The minutes were confirmed with the following amendment:
- Page 9, Line 3 under Item 4.6.5 – Delete “then to cancel the visit” and replace by “subsequently, the visit was cancelled”
6. Agenda Item 2 : Matters Arising
- 6.1 Quality of water in buildings
- Fresh Water Plumbing Quality Maintenance Recognition Scheme (FWPQMRS) (ACQWS Paper No. 16)
- 6.1.1 **WSD** reported that the voluntary Fresh Water Plumbing Quality Maintenance Recognition Scheme had been launched over three years since July 2002. As ACQWS in its Meeting No. 6 on 4

April 2002 endorsed that after Stage 1 Actions under the Scheme, a second customer opinion survey on the quality of water in buildings should be conducted to compare with the one conducted in 2002, it would be the right time to arrange for the second customer opinion survey. This survey would assess the impact of the Scheme as interpreted by the customers and gauge public opinions on water quality in buildings. Also ACQWS endorsed in the same meeting that another survey would be conducted on the opinions of building management companies. It was proposed to call tenders for the surveys in September 2005 with a view to starting the surveys in December 2005 and finalizing the reports in May to June 2006, as detailed in ACQWS Paper No. 16.

6.1.2 The Chairman of the Working Group on Quality of Water in Buildings advised Members that the 3rd meeting of the working group was held on 22 August 2005 to discuss the paper. He summarised the views and comments of the Working Group as given below:-

- a. Targets to achieve
 - i. For reviewing the need for mandatory maintenance -
The drinking habit and culture should be taken into account.
 - ii. For public relation purpose -
The current proposal would serve the purpose.
 - iii. For assessing the effect of the Scheme -
It was suggested to consider the fact that only about 33% of customers have joined the Scheme (including those who had previously joined). Therefore, it might not be the right time to conduct the surveys. It was projected that by 2007, around 70-75% of customers would have joined the Scheme. It would be worth considering to deferring the surveys accordingly.
 - iv. For collecting objective or factual data -
It might be necessary to consider carrying out the following.
 - (1) Analysis of the water quality complaints from 2002 to 2005 to reveal the effect of all WSD efforts on water quality (including those on Dongjiang water);
 - (2) Analysis of media coverage on water quality complaints from 2002 to 2005; and
 - (3) Random sampling from buildings having & not having joined the Scheme for comparison.

b. Sampling Method

It would be necessary to distinguish between responses of

respondents living in a building that has joined the Scheme from those of other respondents.

- c. Survey on the Opinions of Building Management Companies
There was an association formed by 88 major building management companies, which covered 80% of estates/buildings. It would be appropriate to carry out this survey with all the management companies of the association.

- 6.1.3 The Chairman suggested extending the validity period of the certificates from one year to two years and recommended WSD to carry out the surprise check of the water quality of the buildings in the second year. The certificate would be withdrawn from a participant if the water quality test failed. It could reduce the financial implications of renewal of certificates and better cope with the difficult financial situation of the Housing Department (HD). This would also enable all public housing blocks to obtain the certificates and hence increase the participation rates accordingly. HD responded that HD would reconsider the application of certificates to cover all public housing blocks every two years. He assured that they would do their best to maintain their plumbing systems irrespective of application for the certificates and expressed that there were difficulties for them to carry out the full-scale testing in the second year due to limitation of resources. The Vice-Chairman agreed that WSD would consider the proposal to extend the validity period of the certificates to two years and to review the testing requirement for the second year. However, he reiterated that WSD with shrinking resources would find it very difficult to carry out testing for the public in addition to its own workload committed to ensure safe water quality for Hong Kong.

WSD

- 6.1.4 A Member opined that many good building management companies, which maintained large number of buildings over a long period should deserve more confidence such that we could lower the sampling requirement on these companies. The Vice-Chairman responded that it would be difficult for WSD to judge the level of maintenance quality provided by different building management companies.

- 6.1.5 A Member supported the proposal to extend the validity period of the certificates to two years and suggested to allow simplified testing, with less water quality parameters as compared with the one carried out in the first year in order to reduce the cost of testing. The Vice-Chairman reiterated that WSD would review the testing requirement for the second year.

WSD

- 6.1.6 **A Member** had no objection to the proposed opinion surveys. He suggested adding the estimated time required to complete the surveys at the beginning of the questionnaire for the reference of the customers, as there were many items in the questionnaire. He noted that the survey included the opinion on the mandatory maintenance requirements through legislation and suggested that the views from the tenants and the building owners should be assessed separately. **WSD** agreed to the proposed addition and would consider including an item in the questionnaire to differentiate between tenants and building owners. **WSD**
- 6.1.7 **A Member** noted out that the quality of maintenance relied on the management system established, which would not change from time to time. Therefore, she supported the relaxation of testing requirement in subsequent years. Noting that the questionnaire included a question on the drinking water habit of the public, she suggested extending the question to cover, in particular, the percentage of water used for drinking. The information would be useful to formulate the strategy to provide separate water supply systems for drinking and for other purposes. The Vice-Chairman responded that, as there was no plan to promote using an additional supply system for drinking water, it was not recommended to extend that question. He explained that as two separate systems for fresh and salt water supply were already in existence, it would be difficult to build another supply system under the congested environment in Hong Kong.
- 6.1.8 The Chairman asked if Members endorsed conducting the proposed opinion surveys this year. **A Member** supported the proposal to obtain the feedback through the opinion surveys and to review the Scheme. **Another Member** suggested that the opinion survey for the general public could be carried out this year whereas that for building management offices next year as the number of building management companies participating in the Scheme was still low at the moment. The Vice-Chairman clarified that the opinion surveys were not targeted to pave the way to implement the mandatory maintenance requirements through legislation. He then suggested all non-official members to vote for a decision simply by a show of hand. The majority of non-official members (seven out of nine) supported the proposal for **WSD** to conduct the two opinion surveys this year taking into account the above comments. **WSD**
- 6.2 Publication of Water Quality Data
- WSD** reported that **WSD** had published the water quality data for Dongjiang water received in Hong Kong at Muk Wu Pumping

Station and similar data for drinking water in WSD's Homepage each year since August 2000 and this was the ninth time that the data were published. The latest data published in the Homepage on 20 May 2005 covered the period from 1 April 2004 to 31 March 2005 and indicated compliance with the relevant water quality standards, with significant improvement in Dongjiang water quality on completion of the closed aqueduct system on 28.6.2003 some 2 years ago. The forthcoming updating of the water quality data would be carried out in November 2005. The Chairman suggested announcing to the public about the substantial improvement of Dongjiang water quality after commissioning of the closed aqueduct system in the next publication. The Vice-Chairman agreed to arrange a press conference by ACQWS or the Working Group on Publication of Water Quality Data to report the situation to the media.

WSD

6.3 Visit to Guangdong

WSD advised that it was proposed to arrange the next visit around September/October 2005. After some discussions, Members suggested to visit the three major reservoirs along Dongjiang, viz. Fengshuba Reservoir, Xinfengjiang Reservoir and Baipenzhu Reservoir, Taiyuan Pumping Station and Shima River Sewage Division Works. In view that the three reservoirs were quite far away from Hong Kong, the visit would take three days. The Vice-Chairman suggested to arrange the visit in November 2005 so that in the press conference after the visit, the Chairman of the ACQWS or the Chairman of the Working Group on Publication of Water Quality Data, Members could tell the public about the substantial improvement of Dongjiang water quality after completion of the closed aqueduct system and announced the publication of the next batch of water quality data as mentioned in Item 6.2 above.

WSD

6.4 Reclaimed water reuse project at Ngong Ping

WSD briefed Members on the latest development of the reclaimed water reuse project at Ngong Ping. He reported that the construction work had commenced in August 2003 and about 87% of the work had been completed. It was anticipated that the work could be completed on time by the end of 2005. He expected that the plant could be put into operation before commissioning of the cable car system. He added that the Drainage Services Department was arranging an opening ceremony for the sewage treatment plant in Ngong Ping and would invite all Members to join the ceremony. He encouraged Members to attend the opening ceremony to show their support.

6.5 Working Group on Public Education

The Chairman of the Working Group on Public Education reported that after cancellation of the proposed visit in December 2004 arranged for the media, there was no visit being arranged at the moment.

7. There being no other business, the meeting was adjourned at 4:30 p.m.