Memorandum for the Review Committee on Quality Assurance Issues Relating to Fresh Water Supply of Public Housing Estates of the Hong Kong Housing Authority

Final Report of the Task Force on Excessive Lead Content in Drinking Water

PURPOSE

On 31 October, the Task Force on Excessive Lead Content in Drinking Water (Task Force) submitted its Final Report (**Annex A**) to the Secretary for Development. The findings, which are essentially the same as those in its Preliminary Report, are summarized in the paragraphs below.

TASK FORCE'S FINAL REPORT

Key findings

2. The Task Force dismantled more than 100 components of pipes and fittings from three water supply chains in Kai Ching Estate and Kwai Luen Estate Phase 2 and conducted testing of them. It concluded that **excess lead in drinking water in Kai Ching Estate and Kwai Luen Estate Phase 2 was caused by the use of leaded solder materials in the solder joints**. The Task Force did not contain any findings on the nine other public rental housing developments with excess lead in water samples in its Preliminary Report. In its Final Report, the Task Force stated that it had examined the inside service of these nine other public rental housing development and considered that the **cause of excess lead in drinking water in Kai Ching Estate and Kwai Luen Estate Phase 2 should be applicable to these nine housing projects**.

3. The Task Force also found that the brands and models of some valves and taps among the pipes and fittings dismantled from the three water supply chains in Kai Ching Estate and Kwai Luen Estate Phase 2 were not the same as those submitted to the Water Authority (WA) before commencement of construction of the inside service (although they were on the WA's directory list of pipes and fittings). Some of the copper alloy valves and taps did not comply with the British Standard requirements in respect of lead content, but the leaching test results of these copper alloy valves and taps were comparable

to those compliant with the requirements. In other words, these valves and taps would not result in excess lead in drinking water.

4. Separately, the Task Force noted that there was leaching of nickel in some taps dismantled from the two water supply chains of Kai Ching Estate, but it could be flushed away within one to two seconds after turning on the taps. The amounts of chromium and cadmium leached from all the components were very low.

5. In view of the above, the Task Force concluded that –

(a) **Leaded solder joints were the cause of excess lead in drinking water**; and

(b) **Copper alloy fittings also leached lead but did not result in excess lead in drinking water**.

Recommendations

6. The Task Force considered that the excess lead in drinking water incidents reflected **inadequate awareness of the stakeholders in the construction industry on the use of leaded solder materials and its consequences on drinking water quality**. It made the following recommendations to prevent recurrence of similar incidents in the future -

(a) To **prevent the use of leaded solder material and non-conforming pipe fittings** -

(i) To **enhance site inspection and testing system** for plumbing works -

- Engaging qualified persons (e.g. Building Services Engineer or Building Services Inspector) to carry out adequate and regular field inspection.

- Conducting systematic non-destructive tests of solder pipe joints during construction (e.g. conducting quick lead test or using portable x-ray fluorescence analyser/spectrometer).

- Carrying out random sampling and testing of materials delivered to site.

(ii) To stipulate **testing of four additional heavy metals (lead, chromium, cadmium and nickel)** for drinking water samples and to **test for the lead content in solder pipe joints** in newly installed inside service;

(b) WA to explore **the use of pipe materials free from the risk of misuse of leaded solder joints** in plumbing works, e.g. stipulating the use of silver brazing or compression joints for copper pipes, stainless steel pipes or crosslinked polyethylene pipes;

(c) The **Housing Authority to consider requiring the adoption of central procurement for solder material** (and other essential components of the plumbing works as appropriate) by the main contractor in order to clearly define the material supply responsibility and to avoid the use of unapproved materials on site; and

(d) **WA to consider reviewing relevant legislation to effect the above recommendations**.

Points to note

7. The Task Force also **gave the following points to note for the attention of the public** -

(a) If water has been standing in pipes for a long time (for instance, after several hours of non-use, overnight, over a weekend or after a holiday), **the tap should be run for two minutes or longer before using it for drinking or food preparation** in order to avoid high concentration of lead in the stagnated water;

(b) As hot water increases the amount of lead that may leach from pipes and fittings, **only water from a cold water tap should be used for cooking and drinking**; and

(c) For **water supply systems using other pipe materials without solder joints** such as stainless steel pipes, lined galvanised steel pipes or copper pipes with compression joints, t**he risk of having excess lead in drinking water should be low**.

8. Separately, a Member of the Task Force, Dr. George Greene, met with Housing Department on 29 September to share his views on similar issues. The key points he made are summarized at **Annex B**.

INFORMATION

9. This paper is issued for Members' information.

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Annex B

Meeting with Dr. George Greene (a Member of the Task Force on Investigation of Excessive Lead Content in Drinking Water) on 29 September 2015

On 29 September 2015, Water Supplies Department (WSD) arranged a meeting for Dr. George Greene, (a Member of the Task Force on Investigation of Excessive Lead Content in Drinking Water), to share his views with Housing Department's staff. Major points are summarized as follows –

1. Achieving substantial reduction of lead content after 2 minutes of flushing

Dr. Greene advised that based on a number of tests for vacant flats to assess the effects on lead contamination in the pipes and at the tap against the periods of stagnation and flushing, **substantial reduction of lead content could be achieved after 2 minutes of flushing**.

2. Adopting different repair strategy depending on the amount of excess lead in water

Dr. Greene said that as only 2 % to 4 % of flats have actually been sampled for water tests, he opined that further sampling prior to blanket replacement might form a better basis for replacement actions, given the limited plumbers available in the market. Alternatively, it might be more appropriate to adopt different repair strategies depending on the amount of excess lead in water. For example, the replacement of pipes for a flat with WHO test result of 1.5 ug/l might not be the same as that with 9.8 ug/l.

3. Giving advice to tenants especially those using filters

Dr. Greene opined that the following flushing advice should be given to all tenants:

a) If water has been standing in the pipes, for instance, after several hours of stagnation, overnight, over a weekend or after a holiday, tenants should run the water at a tap, usually for about 2 minutes, prior to using it for drinking or food preparation;

b) If water filters are installed, remove the filters first or use the by-pass in the filters for the flushing advice under item 3 a) above.