

Date 20th June 2011

To: Mr Robert Bos
The World Health Organisation
11211 Geneva 27
Switzerland

Dear Mr Bos,

Background document for development of WHO *Guidelines for Drinking-water Quality*
Documents title: **Hardness in Drinking-water**

We are aware of the latest Background Document on Hardness in Drinking-water, now published on the WHO website, and we would like to express our appreciation for your endeavours in amending it to cover water sources other than reverse osmosis and softened water.

We also commend the document for the balanced way in which it represents and interprets the evidence for health benefits associated with hardness minerals in drinking-water.

However, we have some comments which we would like to draw to your attention:

1. In 4.3 it states that "cation-exchange softened water..... has increased amounts of chloride...". Water softening by base-exchange does not affect the anion chemistry. During the service cycle, multivalent cations (calcium, magnesium, iron, etc) in the hard water are replaced by sodium (or potassium). During the regeneration cycle, the multivalent cations are displaced from the resin by sodium from brine and flushed to drain together with the chloride ions from the brine regenerant. So the chloride level of the softened water will be the same as the hard water supply.
2. In 4.3 it states that "cation-exchange softened wateris not necessarily corrosive". It is not clear why the word "necessarily" is included, unless it is perceived to be due to the aforementioned misconception that softened water has increased chloride from the regenerant. Softening water does not change any of the parameters which affect its corrosivity and this issue is often misrepresented. Our opinion is that the word "necessarily" should be deleted.
3. In desalination (4.4) and water-reuse (4.5), it states that the "process should not reduce the total intake of nutrients significantly below recommended values", but it does not define what these "recommended values" are. If they are the ones mentioned in 2.2 "Food", then magnesium is very imprecise at 200 to 400 mg/day and it begs the question:

what are the levels being reduced from when the saline water and unprocessed recycle water were not drinkable before processing?

4. The final paragraph in Household water Treatment 4.9, suggests that an option is to supply softened water to the hot water system only. We would point out that a large proportion of the economic and ecological benefits of softened water would be lost because the cold water supply contributes to scale in dishwashers and washing machines, for example, as well as in the central heating system. Also soap and detergent consumption will not be reduced significantly compared to softening the whole supply to the premises.

We hope we have interpreted the document correctly and look forward to your reply. Of course, we are available for discussion on these points should it be required.

Yours sincerely

Mike Pickavance
Chairman

cc. Bruce Gordon
Penny Ward