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**Submission from:**  
 John M Broadfoot MSc BSc Cert T

**Re: South East Queensland Water (Restructuring) and Other  
 Legislation Amendment Bill 2012**

I respectfully make this submission regarding the proposed amendments to the Queensland 'Water Fluoridation Act 2008', - Part 5: Amendment of Water Fluoridation Act 2008 - with particular reference to Clause 82 - Amendment of s8 (Exemption from requirement to add fluoride to relevant public potable water supply)

**Subclause (d)**

..... the cost to those members or the water supplier of implementing or maintaining the addition of fluoride to the water supply is unreasonable;

**Supporting Statement:** Bundaberg Regional Council has a diverse ratepayer base with many ratepayers not having access to reticulated water consequently the ratepayers, especially the large number without access to reticulated water, will be unfairly penalised in subsidising the fluoridation.

**Subclause (e)**

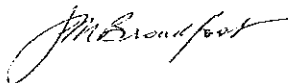
the water supplier can not ensure the effective and safe addition of fluoride to the water supply;

**Supporting Statement:** Recent research conducted by myself for the BRC shows that the chemical analysis of the water from a number of bores varies greatly and it is difficult to control the quality of the reticulated water. This is worsened during dry seasons when some water bores have deteriorating water quality, viz., high sodium and magnesium chloride levels. In view of the difficulties in guaranteeing current water quality it may be beyond the resources of BRC or even the State Government to employ and retain adequately qualified persons to operate equipment used in relation to adding fluoride and maintaining safe doses. Employment of the necessary specialists would soon escalate the cost to BRC and ratepayers.

**Subclause (f)**

the quality of the water supplied from the water supply may not provide a safe supply of potable water for members of the public who consume water from the water supply.

**Supporting Statement:** There is a high risk that technical staff of BRC will not be able to competently maintain reticulated water quality nor fluoride dosage due to the high variation in chemical analyses of the water sources (*Observations on Water Analyses of Bundaberg Water Supply*: Broadfoot, 2012). Of particular concern are the existing levels of natural fluoride in some of the BRC source water.



9 November 2012

## Observations on Water Analyses of Bundaberg Water Supply

*John Broadfoot, MSc, BSc Cert T.*

The following comments are based on data provided by Bundaberg Regional Council (2 July, 2012).

Most analyses of the Bundaberg samples are within or below Australian Drinking Water Guidelines (Esdat Environmental Database, Chapter 10, 2011). However there are notable anomalies. These are most likely due to the variety of sources (surface and groundwater) and would be influenced by the mixture of sources and, in the case of bore (ground) water, seasonal effects.

### 1. Alkalinity

Some analyses show high alkalinity above the Australian Drinking Water Guidelines (ADWG). These levels up to pH 9.04 may cause precipitation of metal ions due to high hydroxide ions. Iron, aluminium and fluoride levels could be affected resulting in less fluoride availability (if the water is fluoridated).

### 2. Aluminium

A number of readings are above the desirable level (0.1 mg/L, ADWG). Levels up to 2.25 mg/L have been recorded for the Branyan supply. Many of the readings are above the desirable level at Bundaberg Depot, Dr Mays Road and Heaps Street. High Aluminium levels may adversely affect uptake and sorption of fluoride. High aluminium levels in drinking water have been shown to cause high excretion and greatly reduced intake of fluoride in humans.

### 3. Sodium

Sodium levels do exceed the aesthetic standard of 180mg/L (ADWG) in a number of sources in the Bundaberg water supply. In some of these there is an associated high level of chloride which could be linked to a bore water source, particularly during dry spells.

It is interesting to note that the EPA (USA) sets a limit of 20mg/L. If sodium fluoride is used to fluoridate water there will be an increase in the sodium analyses.

### 4. Fluoride

Branyan water supply has significant levels of natural fluoride (due to calcium fluoride) with analyses of 0.05 to 0.12 mg/L. (One reading from Heaps Street shows 0.247mg/L). Based on a daily consumption of 2 litres this would equate to an intake of 0.1 – 0.24mg/L per day for a consumer. Health Organisations recommend that the intake of fluoride for infants (less than 6 months age) should be 0.1 – 0.5mg/L. Addition of fluoride to this supply (Branyan) would need very careful monitoring as the level could easily exceed that recommended for infants. (For example: Infants fed Formula milk could consume their daily requirement of fluoride from the natural source).

### 5. Chloride

Chloride levels are variable. This could be linked to the sodium association or possible by-products of chlorination. Further testing for organic compounds of chlorine would be needed to establish causal relationships.

### Conclusion

Extensive monitoring and sampling would be needed to establish the variable levels and sources of the natural fluoride as well as the nature of chemical interactions between ions (aluminium, sodium, iron, magnesium and calcium) before making any decision to add fluoride to this water supply.

