My field of expertise is in the understanding and knowing the effectiveness of *point-of-use (POU)* drinking water chlorination. This is where a specialised chemical treatment technique - designed by myself (referred to commercially as Smartaflow), uses sodium hypochlorite (liquid chlorine) to micro-dose a stream of water - continuously variable in its flow and quality, so as to render it consistently safe for immediate public consumption so as to enable all drinking water providers to conform to Australian drinking Water Guidelines 6, 2011, specific to chapter 10.

Considering my experience in pioneering the Smartaflow process in close collaboration with the Water Corporation (between 1999 & 2002)o enable them to conform to these guidelines, it was not surprising that – when faced with a need for point-of-use chlorination, Busselton Water first sought out my services and my POU technology during 2006. During the years between then and now, I worked for 2 companies that were contracted to supply/commission and assist Busselton Water to operate 2 x Smartaflow Portachlor chlorinators.

It is in this capacity that I offer the following informed comments in support of Public Petition 166, specific to questioning *soundness of the risk assessment analysis and findings/ reports of Busselton Water's Consultants -Hunter Water Australia;* responding specifically to *The April 2010 report* - Presented by Hunter Water Australia to Busselton Water: Disinfection Investigation - Options Analysis.

Other than my responses outlined below to the report, the only comment I wish to add is that, even though there were mitigating circumstances in Busselton Water's favour, they never made good use of the Smartaflow technology, nor did they ever appreciate my ability to make that technology work in their favour. In fact, I would go so far as to say, Busselton Water– and their consultants, appeared to not understand the overall significance of what this technology could do for them, making them either incompetent or – as I am led to believe, they always had their own agenda to introduce primary chlorination.

Either way, this became Busselton Water's biggest, single "missed opportunity" in not being able to simply collaborate with me and the companies I worked for, resulting in a totally unnecessary situation that has since escalated out of all proportion and created such public disquiet.

Chris Speight
15th September 2012

# Chris Speight's direct response to Disinfection Investigation - Options Analysis. Presented by Hunter Water Australia to Busselton Water in April 2010

## 5.2.1 Description

Portachlors provide an effective method for chlorine dosing in a limited area of the reticulation system [**CS1:** BW own 2 x Portachlors (PCs) that use a patented West Australian developed micro-metering chemical technology – called Smartaflow, which is used in a range of chlorine treatment systems throughout Australia, proven to be especially effective in chlorinating and/or re-chlorinating small drinking water supplies.] This can be useful in targeting areas of the system that have had positive readings for potentially pathogenic microorganism indicators [**CS2:** Being the smallest within the Smartaflow range, BW would have chosen the PC for it's ease of deployment, combined with it's ability to be independently powered. However, it is worth noting that even the largest capacity Smartaflow Chlorinator has same capability as the Portachlor, which BW were made aware of both recently and at the point of purchase – see catalogue attached].

The Portachlor systems BW is currently employing use sodium hypochlorite (liquid chlorine), and have an inbuilt chlorine residual meter [**CS3**: These Portachlors use the most sophisticated level of computerised control – referred to as VQ/VC-M, which was the correct selection for this purpose. However - contrary to what was recommended for this type of application, BW took the most unusual step of having both Portachlors factory-modified to accommodate their preferred

type of flowmeter. This resulted in 2 problems: (1) The supply of the PC's were delayed by at least 3 months. (2) It the preferred flow meter type was (at that time) unproven for this type of applications. Whilst this was not the only cause for delay and discourse, in Shenton's view, it was by far the most disruptive to what became a most protracted commissioning process.] This allows for accurate dosing in the vicinity of the unit however the residual dissipates as distance and hydraulic detention time increases. [**CS4:** Given the adhoc methods BW were understood to have used, this is a predictable outcome. However, Shentons would challenge the validity of this statement on the grounds that – from all the evidence Shenton's have and contrary to their repeated offer to assist BW, the PCs were never set-up to operate correctly at the commencement of each deployment, thus compromising their effectiveness - in terms of maximising *break-point* chlorination].

## 5.2.2 Benefits

Portachlors are useful in providing an immediate response when there are positive results for potentially pathogenic microorganism indicators. They can also provide localized disinfection without the need of full scale chlorination. **[CS5: Again,** PCs are specifically designed to manage both these scenarios most effectively, but are unlikely to have proven useful in BWs case, given what has already been stated in SE4. Further, not only would BW experience ineffective results, this type of incorrect operation would invariably create unnecessarily high incidences of taste and odour problems for those community members being subjected to this inconsistent form of treatment.]



## 5.2.3 Implications

Portachlors are not designed for ongoing disinfection or large scale applications [SE1: and cannot act as a barrier in preventing large scale incidents. The units would be insufficient in managing a large scale event. [**CS6:** In a conventional sense this statement is true. However, as Shentons suggested to BW and their consultants, had a collaborative strategy been considered, which maximised the Smartaflow technology, then it is likely that a reliable and ongoing disinfection barrier could have been established and operated to the satisfaction of all stakeholders, at a capital cost of one fiftieth of that expected to be spent on a full-blow chlorination system].

The recent use of Portachlors has increased the duties of the BW operational staff, which is an additional labour cost for BW, along with chemical and maintenance costs for the units. [**CS7:** noted/no comment]

There are also operational health and safety (OH&S) issues in regard to handling and transporting liquid chlorine. If Portachlor use continues and/or increases, these OH&S issues will need to be dealt with by BW through appropriate training and spill response procedures. [**CS8:** As stated in CS6, had BW been receptive to a detailed proposal from Shentons, then such concerns referred to here, would have been fully addressed]

The other major concern in using Portachlor units is adverse customer complaints to ongoing localised chlorination. The situation is that there are areas within the BW reticulation system which have had a history of positive results for potentially pathogenic microorganism indicators [**CS9:** noted/please see CS10].

The likely causes of these positive results are being actively investigated by BW, with Portachlors being deployed in the meantime. However, this often results in the units being located in 'hot spots' for extended periods, which can cause a loss of trust from those customers in the area on the safety of their water. There is also potentially an adverse impact to be managed when customers detect water quality differences when there are rapid changes between chlorinated and un-chlorinated supplies. [**CS10:** As stated in CS5 (see underlined comments), had the PCs been the correct manner, then it is considered very likely that these most unfortunate situations would have never arisen]