Water Tank Sampling, July 2025

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- The chemical water quality in rainwater-harvested water tanks was assessed at 5 residential properties in Bermuda in July 2025 in accordance with the requirements of Belco's Operating License.
- Sample locations were determined by input from Belco and the Department of Environment and Natural Resources (DENR) in response to concerns from residents over the potential for drinking water contamination resulting from atmospheric deposition of exhaust emissions on roof surfaces.
- Water samples were analysed for total dissolved solids (TDS), total suspended solids (TSS), pH, a suite of 31 metals, and a suite of 21 polycyclic aromatic hydrocarbons (PAHs – also called polyaromatic hydrocarbons).
- The results were compared with Primary and Secondary Drinking Water Standards in effect in Bermuda and the USA.
- The Bermuda Secondary Drinking Water Standard for aluminium (Al) was exceeded at one location. Exceedance of Secondary Drinking Water Standards generally results in aesthetic and cosmetic effects (i.e. appearance, odour, and taste of water) and does not indicate an immediate health risk.
- No other Primary or Secondary Drinking Water Standards were exceeded.

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1 - Sampling

Water sampling was conducted by BIOS personnel on 14 July 2025, witnessed by representatives from BELCO and DENR. All water samples were collected from a spigot or faucet located as close to the foot valve as possible and prior to any domestic water treatment processes.

Samples were collected in pre-cleaned bottles supplied by the analytical laboratory. At each location, bottles were handled while wearing new nitrile gloves to avoid sample contamination.

Water was sampled from tanks at the following locations:
Site 1) 6 Berkley Mews.
Site 2) 101 St. John's Rd.
Site 3) 3 School Lands Ln.
Site 4) 8 Serpentine Rd.
Site 5) 8 Overview Hill.

After filling, sample containers were immediately labelled and double-bagged in polyethylene "zip-lock" bags and kept in coolers. After sampling all sites, the coolers were filled with ice and were dispatched by courier for express shipping to the analytical laboratory. Chain of custody forms were completed by BIOS personnel to record all sample information and copies of these were dispatched with the samples.

All chemical analyses were performed by Bureau Veritas Laboratories, Bedford, Nova Scotia, Canada. BV Labs are accredited by the Standards Council of Canada and conform with the requirements of ISO/IEC 17025:2005.

Water samples were analysed for "inorganics", including total dissolved solids (TDS), total suspended solids (TSS), and water pH; a suite of 31 metals; and a suite of 21 polycyclic aromatic hydrocarbons (PAHs).

2 - Results

Analytical results for water from the 5 locations are shown in Table 2 (inorganics and metals) and Table 3 (PAHs). These results were compared with the drinking water standards in effect in Bermuda, as legislated by the Department of Health, and also with the US Federal drinking water regulations established by the US Environmental Protection Agency (EPA). Both sets of standards are shown in Table 1, below.

There are currently no drinking water regulatory standards in effect on Bermuda (or elsewhere around the world) for all of the individual PAH compounds. Rather, PAH levels are regulated by applying a limit for the PAH benzo[a]pyrene (BaP), which is typically considered the most toxic of the PAH compounds. In Bermuda, the limit for BaP is 0.2 µg/L, compared to 0.7 µg/L (World Health Organisation), 0.01 µg/L (Canada, EU, UK) and 2 µg/L (USA); none of these limits were exceeded by BaP.

Comparison of the data in Table 2 with the standards in Table 1 indicate one incident of a Secondary Drinking Water Standard being exceeded: water at locations 4 exceeded the standard for aluminium (sample concentration of 240 µg/L versus a secondary standard of 200 µg/L). Secondary Drinking Water Standards are established for protection on aesthetic or taste grounds. Exceedance of these values may cause negative visual and/or taste and odour responses. High concentrations of aluminium (Al) may arise from soil present in the water tank (Al is naturally present at high concentrations in local soil), or from the corrosion of aluminium fittings located in or close to the roof-tank system.

		BERMUDA		USA	
	Units	**Primary Std**	**Secondary Std**	**Primary Std**	**Secondary Std**
Total Dissolved Solids	mg/L		500		500
Total Mercury (Hg)	µg/L	2.0		2.0	
Total Aluminum (Al)	µg/L		200		200
Total Antimony (Sb)	µg/L			6.0	
Total Arsenic (As)	µg/L	10		10	
Total Barium (Ba)	µg/L			2000	
Total Beryllium (Be)	µg/L			4.0	
Total Cadmium (Cd)	µg/L	5.0		5.0	
Total Chromium (Cr)	µg/L	100		100	
Total Copper (Cu)	µg/L		1000	1300*	1000
Total Iron (Fe)	µg/L		300		300
Total Lead (Pb)	µg/L			15*	
Total Manganese (Mn)	µg/L		50		50
Total Selenium (Se)	µg/L	50		50	
Total Silver (Ag)	µg/L		100		100
Total Thallium (Tl)	µg/L			2.0	
Total Uranium (U)	µg/L			30	
Total Zinc (Zn)	µg/L		5000		5000
Benzo(a)pyrene	µg/L			0.2	
2,3,7,8-Tetra CDD	pg/L			30	

Table 1: Drinking water standards in effect in Bermuda and USA. * denotes action level limit.

		1	2	3	4	5	Max RDL
		6 Berkley Mews	101 St. John's Rd.	3 School Lands Ln.	8 Serpentine Rd.	8 Overview Hill	
Inorganics							
Total Dissolved Solids	mg/L	54	240	79	41	62	20
pH	pH	7.90	8.15	7.87	7.84	7.83	NA
Total Suspended Solids	mg/L	1.2	ND	ND	1.2	1.0	1.0
Metals							
Total Mercury (Hg)	µg/L	ND	ND	ND	ND	ND	0.013
Total Aluminum (Al)	µg/L	110	27	200	240	160	5.0
Total Antimony (Sb)	µg/L	ND	ND	ND	ND	ND	1.0
Total Arsenic (As)	µg/L	ND	ND	ND	ND	ND	1.0
Total Barium (Ba)	µg/L	5.1	3.5	5.5	7.0	4	1.0
Total Beryllium (Be)	µg/L	ND	ND	ND	ND	ND	0.10
Total Bismuth (Bi)	µg/L	ND	ND	ND	ND	ND	2.0
Total Boron (B)	µg/L	ND	430	ND	ND	ND	50
Total Cadmium (Cd)	µg/L	ND	ND	ND	ND	ND	0.010
Total Calcium (Ca)	µg/L	11000	56000	16000	12000	14000	100
Total Chromium (Cr)	µg/L	ND	2	ND	ND	ND	1.0
Total Cobalt (Co)	µg/L	ND	ND	ND	ND	ND	0.40
Total Copper (Cu)	µg/L	7	28	1	1	1	0.50
Total Iron (Fe)	µg/L	ND	ND	ND	ND	ND	50
Total Lead (Pb)	µg/L	0.63	ND	ND	ND	ND	0.50
Total Magnesium (Mg)	µg/L	660	2500	720	490	820	100
Total Manganese (Mn)	µg/L	ND	ND	ND	ND	2.2	2.0
Total Molybdenum (Mo)	µg/L	ND	ND	ND	ND	ND	2.0
Total Nickel (Ni)	µg/L	ND	7.3	ND	ND	ND	2.0
Total Phosphorus (P)	µg/L	ND	ND	ND	ND	ND	100
Total Potassium (K)	µg/L	590	4200	660	250	370	100
Total Selenium (Se)	µg/L	ND	0.67	ND	ND	ND	0.50
Total Silver (Ag)	µg/L	ND	ND	ND	ND	ND	0.10
Total Sodium (Na)	µg/L	6700	26000	7300	3500	6100	100
Total Strontium (Sr)	µg/L	80	950	130	80	120	2.0
Total Thallium (Tl)	µg/L	ND	ND	ND	ND	ND	0.10
Total Tin (Sn)	µg/L	ND	ND	ND	ND	ND	2.0
Total Titanium (Ti)	µg/L	2.1	ND	ND	ND	ND	2.0
Total Uranium (U)	µg/L	ND	0.65	ND	ND	ND	0.10
Total Vanadium (V)	µg/L	5.8	2.1	10.0	2.2	4.3	2.0
Total Zinc (Zn)	µg/L	42	29	ND	13.0	7	5.0

Table 2: Total Dissolved Solids, Total Suspended Solids, pH and Total Metals in tank water at 5 locations in Bermuda, July 2025. ND = not detected; RDL = Reportable Detection Limit. Red shading indicates an exceedance of a drinking water standard – see text for further information.

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		6 Berkley Mews	101 St. John's Rd.	3 School Lands Ln.	8 Serpentine Rd.	8 Overview Hill	
Polyaromatic Hydrocarbons							
1-Methylnaphthalene	µg/L	ND	ND	ND	ND	ND	0.05
2-Methylnaphthalene	µg/L	ND	ND	ND	ND	ND	0.05
Acenaphthene	µg/L	ND	ND	ND	ND	ND	0.01
Acenaphthylene	µg/L	ND	ND	ND	ND	ND	0.01
Anthracene	µg/L	ND	ND	ND	ND	ND	0.01
Benzo(a)anthracene	µg/L	ND	ND	ND	ND	ND	0.01
Benzo(a)pyrene	µg/L	ND	ND	ND	ND	ND	0.01
Benzo(b)fluoranthene	µg/L	ND	ND	ND	ND	ND	0.01
Benzo(b/j)fluoranthene	µg/L	ND	ND	ND	ND	ND	0.02
Benzo(g,h,i)perylene	µg/L	ND	ND	ND	ND	ND	0.01
Benzo(j)fluoranthene	µg/L	ND	ND	ND	ND	ND	0.01
Benzo(k)fluoranthene	µg/L	ND	ND	ND	ND	ND	0.01
Chrysene	µg/L	ND	ND	ND	ND	ND	0.01
Dibenzo(a,h)anthracene	µg/L	ND	ND	ND	ND	ND	0.01
Fluoranthene	µg/L	ND	ND	ND	ND	ND	0.01
Fluorene	µg/L	ND	ND	ND	ND	ND	0.01
Indeno(1,2,3-cd)pyrene	µg/L	ND	ND	ND	ND	ND	0.01
Naphthalene	µg/L	ND	ND	ND	ND	ND	0.20
Perylene	µg/L	ND	ND	ND	ND	ND	0.01
Phenanthrene	µg/L	ND	ND	ND	ND	ND	0.01
Pyrene	µg/L	ND	ND	ND	ND	ND	0.01

Table 3: PAHs in tank water at 5 locations in Bermuda, July 2025. ND = not detected; RDL = Reportable Detection Limit.

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