Supplementary Table 1: Guidelines stipulated by the Department of Water Affairs and Forestry (DWAF) in 1996 and the South African National Standards (SANS) 241 in 2015

Constituent in µg/L	DWAF V1 Domestic use	DWAF V2 Recreational use	DWAF V3 Industrial use	DWAF V4 Agricultural use: Irrigation	DWAF V5 Agricultural use: Livestock watering	DWAF V6 Agricultural use: Aquaculture	DWAF V7 Aquatic Ecosystems	SANS 241	General effluent standard	
									General limit	Special limit
Alkalinity ($CaCO_3$)			i) $0–5\times10^4$ ii) $0–1.2\times10^5$ iii) $0–3\times10^5$ iv) $0–10^6$			$2\times10^4–10^5$				
Aluminium	0–150			$0–5\times10^3$	$0–5\times10^3$	< 30	5–10	≤ 300		
Ammonia	$0–1\times10^3$					0–25	$0–7\times10^{-9}$	$\leq 1.5\times10^3$	6×10^3	2×10^3
Antimony								≤ 20		
Arsenic	$0–1\times10^{-8}$			0–100	$0–10^3$	0–50	10	≤ 10	20	0
Atrazine	$0–2\times10^{-9}$					$0–1.8\times10^{-8}$	10			
Barium								≤ 700		
Beryllium				0–100						
Boron				0–500	$0–5\times10^3$			$\leq 2.4\times10^3$	10^3	500
Cadmium	0–5			0–10	0–10		0–0.4	≤ 3	5	1
Calcium	$0–3.2\times10^4$				$0–10^6$					
Chemical oxygen demand			i) $0–10^4$ ii) $0–1.5\times10^4$ iii) $0–3\times10^4$ iv) $0–7.5\times10^4$						7.5×10^4	3×10^4

Chloride		i) 0–2×10^4 ii) 0–4.5×10^4 iii) 0–10^5 iv) 0–10^5	0–10^5	0–1.5×10^6	< 6×10^5		≤ 3×10^5		
Chlorine	0–10^5					0.2	≤ 5×10^3	250	0
Chromium (VI)			0–100	0–10^3	< 0–2×10^{-8}	7		50	20
Cobalt			0–50	0–10^3		0–1.4			
Copper	0–10^3		0–200	0–500	< 5		≤ 2×10^3	10	2
Cyanide					< 20	1	≤ 200	20	10
Dissolved organic carbon	0–5×10^3								
Dissolved oxygen					6–9	80–120% of saturation			
Endosulfan						0.01			
Fluoride	0–10^3		0–2×10^3	0–2×10^3		750	≤ 2.5×10^5	10^3	10^3
Iron	0–100	i) 0–100 ii) 0–200 iii) 0–300 iv) 0–10^4	0–5×10^3	0–10^4	< 10	< 10% of background dissolved iron concentration	≤ 2×10^3	300	300
Lead	0–10^{-8}		0–200	0–100	< 10	0–1.2	≤ 10	10	6
Lithium			0–2.5×10^3						
Magnesium	0–30 000			0–5×10^5					
Manganese	0–50	i) 0–50 ii) 0–100 iii) 0–200	0–20	0–10^4	< 100	180	≤ 400	100	100

			iv) 0–1×10^{4}							
Mercury	0–10^{-9}				0–10^{3}	< 10^{3}	0.04×10^{-9}	≤ 6	5	1
Molybdenum				0–10	0–10					
Monochloramine								≤ 3×10^{3}		
Nickel				0–200	0–10^{3}			≤ 70		
Nitrate	0–6×10^{3}				0–10^{5}	< 3×10^{5}		≤ 1.1×10^{4}	1.5×10^{4}	1.5×10^{3}
Nitrite						< 50		≤ 900		
Nitrogen (inorganic)				0–5×10^{3}			v) < 500 vi) 500–2.5×10^{3} vii) 2.5×10^{3}–10^{4} viii) >10^{4}			
pH	6–9	6.5–8.5	i) 7–8 ii) 6.5–8 iii) 6.5–8 iv) 5–10	6.5–8.4		6.5–9	5–10	≥ 5–≤ 9.7	5.5–9.5	5.5–7.5
Phenol	0–10^{-9}					< 10^{3}		≤ 10		
Phosphorus (inorganic)						100	v) < 5×10^{-9} vi) 5×10^{-9}–$2\ 5\times10^{-9}$ vii) $2\ 5\times10^{-9}$ – 250×10^{-9} viii) >250×10^{-9}		10^{4}	10^{3} (median); 2.5×10^{3} (max)
Potassium	0–5×10^{4}									
Selenium	0–2×10^{-8}			0–20	0–5×10^{-8}	< 300	2	≤ 40	20	20
Silica			i) 0–5×10^{3} ii) 0–10^{4}							

		iii) $0–2\times10^4$ iv) $0–1.5\times10^5$							
Sodium adsorption ratio			2						
Sodium	$0–10^5$		$0–7\times10^4$	$0–2\times10^6$			$\leq 2\times10^5$		
Sulphate	$0–2\times10^5$	i) $0–3\times10^4$ ii) $0–8\times10^4$ iii) $0–2\times10^5$ iv) $0–5\times10^5$		$0–10^6$			$\leq 5\times10^5$		
Sulphide					< 1				
Suspended solids		i) $0–3\times10^3$ ii) $0–5\times10^3$ iii) $0–5\times10^3$ iv) $0–2.5\times10^4$	$0–5\times10^4$					2.5×10^4	10^4
Total chromium							≤ 50		
Total dissolved solids	$0–4.5\times10^5$	i) $0–10^5$ ii) $0–10^5$ iii) $0–4.5\times10^5$ iv) $0–1.6\times10^6$	0–256	$0–10^6$	$< 2\times10^3$				
Total Hardness		i) $0–5\times10^4$ ii) $0–10^5$ iii) $0–2.5\times10^5$ iv) $0–10^6$			20–100				
Total organic carbon							≤ 10		

Trihalomethanes	$0–10^{-7}$							≤ 1		
Uranium	0–70			0–10				≤ 10		
Vanadium	0–100			0–100	$0–10^3$					
Zinc	$0–3×10^3$			$0–10^3$	$0–2×10^4$		2	$≤ 5×10^3$	100	40
References	DWAF, 1996a	DWAF, 1996b	DWAF, 1996c	DWAF, 1996d	DWAF, 1996e	DWAF, 1996f	DWAF, 1996g	SANS 241, 2015	Government Gazette, 2013	

i: Industrial processes that needs high quality water; ii: Water of intermediate to high quality is required for these processes; iii: Domestic water quality with baseline minimum standards; iv: Industrial processes which can use water of any quality; v: Under oligotrophic conditions; vi: Mesotrophic conditions; vii: Eutrophic conditions; viii: Hypertrophic conditions

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