RAND WATER

Royal Bafokeng Water Quality Report

22 August 2019 to 21 August 2020 — **12 Month** — **Date generated: 28 August 2020**

Determinands	Measurement Units	Risks	SANS 241:2015 standard limits (1)	No of results	Required compliances to SANS 241:2015 spec(%)	Achieved compliances to SANS 241:2015 spec(%)	Descriptive Statistics: Mean	Standard Deviation	Mean + 3 Std deviations
Microbiological determinands									
E. coli	(mpn per 100 mL)	Acute health	Non-detect	256	99.0%	99.22%	0	2.07	6
Total Coliforms	(mpn per 100 mL)	Operational	≤ 10	256	95.0%	89.45%	10	38.82	127
Heterotrophic Plate Count	(cfu per 1 mL)	Operational	≤ 1000	256	95.0%	86.72%	441	1,221.46	4105
Cryptosporidium spp (2)	(org / 10 Litre)	Acute health	Non-detect	25	99.0%	100%	0	0.00	0
Giardia spp (2)	(org / 10 Litre)	Acute health	Non-detect	25	99.0%	96.00%	0	0.20	1
Somatic Coliphages (2)	(count per 10 mL)	Operational	Non-detect	96	95.0%	100%	0	0.00	0
Physical and Aesthetic determinands									
Colour	(mg / L as Pt-Co)	Aesthetic	≤ 15	110	95.0%	100%	5.28	1.00	8.27
Conductivity	(mS / m)	Aesthetic	≤ 170	251	95.0%	100%	65.95	14.91	110.67
Total Dissolved Solids	(mg / L)	Aesthetic	≤ 1200	82	95.0%	100%	405.67	90.53	677.26
Turbidity	(NTU)	Operational	≤ 1	253	95.0%	99.21%	0.33	0.12	0.68
Turbidity	(NTU)	Aesthetic	≤ 5	253	95.0%	100%	0.33	0.12	0.68
pH	(pH units)	Operational	≥ 5 to ≤ 9.7	250	95.0%	100%	7.88	0.22	8.53
Chemical Properties: Macro determinands									
Ammonia	(mg / L as N)	Aesthetic	≤ 1.5	250	95.0%	100%	0.11	0.15	0.55
Chloride	(mg / L as Cl)	Aesthetic	≤ 300	100	95.0%	100%	88.94	26.42	168.20
Free chlorine	(mg / L as Cl_2)	Chronic health	≤ 5	256	97.0%	100%	0.84	0.68	2.86
Monochloramine	(mg / L as Cl_2)	Chronic health	≤ 4.1	255	97.0%	100%	0.22	0.27	1.02
Fluoride	(mg / L as F)	Chronic health	≤ 1.5	103	97.0%	100%	0.48	0.23	1.17
Nitrate	(mg / L as N)	Acute health	≤ 11	247	99.0%	100%	0.52	0.15	0.97
Nitrite	(mg / L as N)	Acute health	≤ 0.9	254	99.0%	100%	0.02	0.06	0.20
Combined nitrate plus nitrite (3)	(mg / L as N)	Acute health	≤ 1	252	99.0%	100%	0.14	0.20	0.76
Residual disinfectant (4)	(mg / L as Cl_2)	Operational	≥ 0.1	256	95.0%	97.66%	1.05	0.65	3.01
Sodium	(mg / L as Na)	Aesthetic	≤ 200	108	95.0%	100%	60.25	13.90	101.97
Sulphate	(mg / L as SO_4)	Aesthetic	≤ 250	104	95.0%	100%	71.10	18.29	125.98
Sulphate	(mg / L as SO_4)	Acute health	≤ 500	104	99.0%	100%	71.10	18.29	125.98
Zinc	(mg / L as Zn)	Aesthetic	≤ 5	108	95.0%	100%	0.02	0.02	0.08
Chemical Properties: Micro determinands									
Aluminium	(µg / L as Al)	Operational	≤ 300	108	95.0%	100%	45.81	29.16	133.29
Antimony	(µg / L as Sb)	Chronic health	≤ 20	60	97.0%	100%	0.64	0.15	1.09
Arsenic	(µg / L as As)	Chronic health	≤ 10	65	97.0%	100%	3.54	3.10	12.82
Barium	(µg / L as Ba)	Chronic health	≤ 700	108	97.0%	100%	56.52	12.44	93.84
Boron	(µg / L as B)	Chronic health	≤ 2400	108	97.0%	100%	43.06	13.12	82.42
Cadmium	(µg / L as Cd)	Chronic health	≤ 3	65	97.0%	100%	1.16	0.27	1.98
Chromium (Total)	(µg / L as Cr)	Chronic health	≤ 50	108	97.0%	100%	5.00	0.00	5.00
Copper	(µg / L as Cu)	Chronic health	≤ 2000	108	97.0%	100%	11.02	5.78	28.35
Cyanide (Recoverable)	(µg / L as CN)	Acute health	≤ 200	108	99.0%	100%	5.00	0.00	5.00
Iron	(µg / L as Fe)	Chronic health	≤ 2000	108	97.0%	100%	25.16	26.73	105.35
Iron	(µg / L as Fe)	Aesthetic	≤ 300	108	95.0%	100%	25.16	26.73	105.35
Lead	(µg / L as Pb)	Chronic health	≤ 10	65	97.0%	100%	3.76	2.75	12.00
Manganese	(µg / L as Mn)	Chronic health	≤ 400	108	97.0%	100%	18.81	14.68	62.85
Manganese	(µg / L as Mn)	Aesthetic	≤ 100	108	95.0%	100%	18.81	14.68	62.85
Mercury	(µg / L as Hg)	Chronic health	≤ 6	64	97.0%	100%	1.03	0.33	2.02
Nickel	(µg / L as Ni)	Chronic health	≤ 70	108	97.0%	100%	5.02	0.17	5.54
Selenium	(µg / L as Se)	Chronic health	≤ 40	65	97.0%	100%	5.30	1.84	10.82
Uranium	(µg / L as U)	Chronic health	≤ 30	60	97.0%	100%	0.68	0.50	2.18
Organic determinands									
Total Organic Carbon	(mg / L)	Chronic health	≤ 10	70	97.0%	100%	5.06	0.98	8.01
Phenols as C_6H_5OH	(µg / L)	Aesthetic	≤ 10	70	95.0%	100%	3.00	0.00	3.00
Chloroform - $CHCl_3$	(µg / L)	Chronic health	≤ 300	70	97.0%	100%	21.56	11.42	55.82
Bromoform - $CHBr_3$	(µg / L)	Chronic health	≤ 100	70	97.0%	100%	10.00	0.00	10.00
Dibromochloromethane - $CHBr_2Cl$	(µg / L)	Chronic health	≤ 100	70	97.0%	100%	16.49	4.24	29.21
Bromodichloromethane - $CHBrCl_2$	(µg / L)	Chronic health	≤ 60	70	97.0%	100%	20.43	7.03	41.53
Combined trihalomethanes (5)	(µg / L)	Chronic health	≤ 1	69	97.0%	100%	0.59	0.21	1.22
Total Microcystin (2)	(µg / L)	Chronic health	≤ 1	68	97.0%	100%	0.31	0.00	0.31
For monitoring/reporting purposes only									
Calcium (6)	(mg / L as Ca)	Aesthetic	≤ 150	108	not applicable	100%	33.47	5.45	49.81
Hardness (7)	(mg / L as $CaCO_3$)	Operational	≥ 20 to ≤ 200	107	not applicable	99.07%	160.21	27.70	243.31
Magnesium (6)	(mg / L as Mg)	Aesthetic	≤ 70	108	not applicable	100%	22.10	4.55	35.73
Potassium (6)	(mg / L as K)	Aesthetic	≤ 50	108	not applicable	100%	8.94	1.61	13.76
Rand Water Risk Determinands (RWRD) (6)									
Odour	TON	RWRD	≤ 2	143	not applicable	100%	1.02	0.15	1.47
Taste	FTN	RWRD	≤ 2	143	not applicable	100%	1.02	0.15	1.47

Water quality risk indices

Risks	Required compliances to SANS 241: 2015 standard	Overall Compliances - SANS 241: 2015 standard
Acute health microbiological	99.0%	99.02%
Acute health chemical	99.0%	100%
Chronic health	97.0%	100%
Aesthetic	95.0%	100%
Operational	95.0%	95.32%

Notes
(1) Specification_SANS 241 date of effect : 1 July 2016
(2) Measured at water treatment works exit points
(3) (NO2/0.9 + NO3/11)
(4) Residual disinfectant : Results from the chloraminated system = Sum of Free and Monochloramine
(5) (CHCl3/300 + CHBr3/100 + CHBr2Cl/100 + CHBrCl2/60)
(6) Customer request: Results not included in the risk indices compliance calculations and limits based on SANS 241:2006
(7) Customer request: Results not included in the risk indices compliance calculations and limits based on RW Internal Spec