



RAND WATER

Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment

1 January 2014 - 31 December 2014

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	M-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	L. coli
VSV	Sandspruit above Volksrust 27°14'26.03"S 29°53'21.78"E	0.25	<10	0.22	48	<0.10	0.20	14	20	16	7.00	
		0.20	11	0.14	96	0.15	0.08	23	<10	25	7.80	
		0.25	<10	0.14	75	0.10	0.16		9	20	7.80	
VSS	Sandspruit below Vaal River @ Kliplaatsdrift 27°12'30.82"S 29°26'12.83"E	0.25	<10	0.27	87	<0.10	0.15	22	21	24	7.60	
		0.20	<10	0.22	165	<0.10	0.12	34	<10	40	8.20	
		0.25	12	0.30	210	0.14	0.19	45	7	47	8.40	
KB	Klip River @ Barnardskop 27°28'12.33"S 29°36'1.76"E	0.59	<10	0.14	140	0.12	0.08	5	28	36	8.00	
		0.25	<10	0.17	42	<0.10	0.29	<5.0	25	13	7.10	
		0.20	<10	0.85	45	0.20	0.08	8	<10	11	7.30	
KW	Klip @ Winkelhaak 27°14'41.55"S 29°23'59.91"E	0.25	<10	0.08	65	0.37	0.19	22	7	15	8.10	
		0.22	<10	0.22	46	0.86	0.08	20	26	22	7.80	
		0.25	<10	0.26	94	<0.10	0.52	13	21	24	7.50	
KD	Klip River @ De Langesdrift 27°10'57.77"S 29°14'5.54"E	0.31	<10	0.19	85	0.11	0.26	12	<10	21	7.50	
		0.25	<10	0.20	140	0.25	0.32	52	5	31	8.00	
		0.34	12	0.26	135	0.44	0.05	26	16	34	7.90	
KSV	Spruitsonderdrift downstream of Vrede 27°21'8.15"S 29°10'16.87"E	0.25	<10	0.26	92	<0.10	0.25	16	24	24	7.40	
		0.20	<10	0.25	150	0.37	0.08	23	<10	34	7.90	
		0.20	<10	0.31	200	0.62	0.40	38	5	43	8.20	
VDS	Vaal River downstream of Standerton 27°05'59.97"S 29°12'29.30"E	0.20	10	0.30	120	0.96	0.12	28	32	31	7.60	
		0.25	<10	0.28	135	0.38	0.24	21	26	34	7.90	
		0.20	17	0.28	180	0.69	0.16	39	31	47	8.50	
VGB	Gladdedrift Bridge @ Villiers 26°59'31.24"S 28°43'47.18"E	0.25	35	0.44	255	0.24	0.32	84	39	58	8.90	
		1.50	24	0.37	215	0.85	0.43	65	38	55	7.80	
		0.25	<10	0.30	75	0.31	0.23	21	28	23	7.20	
VV	Vaal @ Villiers 27°12'0.13"S 28°36'0.32"E	0.20	<10	0.23	125	0.38	0.08	28	17	30	8.00	
		0.25	13	0.30	150	0.96	0.19	34	25	36	8.50	
		0.18	10	0.31	105	0.58	0.08	24	25	31	7.50	
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26°53'27.99"S 28°15'0.16"E	2.50	30	0.36	97	0.34	0.82	44	32	28	7.40	
		0.20	<10	0.25	135	0.78	0.08	26	21	34	7.70	
		0.25	10	0.30	160	0.42	0.14	30	18	39	8.40	
WF	Wilge River @ Frankfort 27°16'18.00"S 28°29'28.41"E	0.18	11	0.26	115	0.90	0.08	34	25	33	7.90	
		0.25	<10	0.22	48	<0.10	0.20	14	20	16	7.00	425
		0.20	<10	0.26	120	0.52	0.11	28	16	31	7.80	27
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26°59'1.64"S 28°13'25.08"E	0.69	15	0.36	170	0.41	0.24	25	18	43	8.30	89
		0.18	12	0.42	135	2.60	0.06	33	22	37	8.00	44
		0.20	<10	0.34	65	0.59	0.13	28	28	21	7.40	13
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26°53'48.81"S 28°11'9.92"E	0.20	<10	0.25	61	0.74	0.13	22	27	22	7.20	2
		0.25	<10	0.48	69	0.67	0.12	22	20	21	8.00	5
		0.18	<10	0.25	85	0.31	0.06	25	21	24	8.10	11
VD1I	Vaal Dam 1 Integrated @ RW intake 26°53'0.26"S 28°7'14.35"E	0.20	<10	0.18	53	0.33	0.08	7	16	14	7.30	2,500
		0.20	<10	0.08	50	0.42	0.10	8	<10	11	7.40	84
		0.25	<10	0.19	46	0.36	0.10	7	9	11	7.40	290
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	0.18	<10	0.25	56	2.50	0.06	18	9	14	7.60	2,210
		0.25	<10	0.23	59	0.23	0.10	14	16	16	7.60	3,500
		4.50	<10	0.21	58	0.46	0.40	18	25	18	7.40	3
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	0.20	<10	0.28	62	0.91	0.11	19	16	16	8.10	5
		<0.092	<10	0.18	61	0.38	0.06	11	14	16	7.80	3
		0.25	<10	0.27	63	0.64	0.16	28	19	20	7.60	7
S-FRANKF_NAMA HA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	0.20	<10	0.24	61	0.92	0.08	29	17	21	7.40	4
		0.20	14	0.51	61	2.10	0.08	85	17	17	7.90	1
		0.13	<10	0.18	63	0.79	0.06	14.00	16	22	7.30	3
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	0.25	<10	0.29	67	0.51	0.10	27	16	21	7.60	50
		0.20	<10	0.22	62	0.83	0.11	34	18	22	7.40	7
		0.20	<10	0.31	64	1.00	0.08	34	20	18	8.10	3
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	<0.092	<10	0.23	62	2.50	0.10	19	16	18	7.90	19
		0.23	21	0.40	66	1.80	0.12	38	26	17	7.60	
		19	38	0.44	250	0.13	2.70	34	155	73	7.30	9,188,000
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	24	52	0.37	250	<0.10	3.20	28	210	71	7.00	6,208,500
		27	32	0.31	250	0.76	2.80	42	235	76	7.40	3,947,300
		15	58	0.22	205	1.80	3.50	71	97	77	7.50	172,640
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	6	29	0.30	88	8.20	3.00	37	47	50	7.40	6,670
		13	39	0.12	170	0.91	3.60	39	50	58	8.00	10
		10	49	0.25	190	0.30	3.60	36	87	66	7.80	215
S-FRANKF_NAMA HA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	5	31	0.11	82	13.00	3.40	29	36	45	7.40	1,630
		4	30	0.28	130	7.30	1.90	39	28	49	7.70	365
		15	74	0.30	270	1.80	2.90	56	125	91	7.70	145,350

Sewage Works Compliance (where applicable) to General Standard (GN 1191 Oct 1999)

Sample Points	Sample Point Description	Ammonia	Fluoride	Nitrate	Phosphate	Chemical Oxygen Demand	Conductivity	pH	L. coli			
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	19	21	0.44	250	0.13	2.70	34	155	73	7.30	9,188,000
		24	38	0.37	250	<0.10	3.20	28	210	71	7.00	6,208,500
		27	52	0.31	250	0.76	2.80	42	235	76	7.40	3,947,300
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	15	32	0.22	205	1.8	3.50	71	97	77	7.50	172,640
		6	29	0.30	88	8.2	3.00	37	47	50	7.40	6,670
		13	39	0.12	170	0.91	3.60	39	50	58	8.00	10
S-FRANKF_NAMA HA	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	10	49	0.25	190	0.3	3.60	36	87	66	7.80	215
		5	31	0.11	82	13.00	3.40	29	36	45	7.40	1,630
		4	30	0.28	130	7.30	1.90	39	28	49	7.70	365
S-FRANKF_OXI_P	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	15	58	0.22	205	1.80	3.50	71	97	77	7.50	172,640
		6	29	0.30	88	8.2	3.00	37	47	50	7.40	6,670
		13	39	0.12	170	0.91	3.60	39	50	58	8.00	10
S-FRANKF_OXI_P	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	10	49	0.25	190	0.3	3.60	36	87	66	7.80	215
		5	31	0.11	82	13.00	3.40	29	36	45	7.40	1,630
		4	30	0.28	130	7.30	1.90	39	28	49	7.70	365

S-ORANJEVILLE	WWTW											
		5	0.11	82	13	3.40	29	36	45	7.40	1.630	
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW		31									
		4	0.28	130	7.3	1.90	39	28	49	7.70	365	
S-VILLIERS	Final Effluent of Villiers WWTW		30									
		15	0.30	270	1.8	2.90	56	125	91	7.70	145,350	
74												

Key

VD11	Vaal Dam 1 Integrated @ RW intake	0.12	-	1 Jan 14 - 31 Mar 14
		0.12	-	1 Apr 14 - 30 Jun 14
		0.12	-	1 July 14 - 30 Sept 14
		0.12	-	1 Oct 14 - 31 Dec 14

Water Quality Guidelines

	-	Ideal
	-	Acceptable
	-	Tolerable
	-	Unacceptable
	-	No sample or result available

In-stream Water Quality Guidelines for the Vaal Dam Catchment

Variables	Measured as	Ideal Catchment Background	Acceptable Management Target	Tolerable Interim Target	Unacceptable
Physical					
Conductivity	mS/m	< 10	10 - 30	30 - 45	> 45
pH	pH units	6.5 - 8.5			< 6.5; > 8.5
Organic					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 15	15 - 20	> 20
Macro Elements					
Ammonia (NH ₄)	mg/l	< 0.2	0.2 - 0.5	0.5 - 1.0	> 1
Chloride (Cl)	mg/l	< 25	25 - 50	50 - 75	> 75
Fluoride (F)	mg/l	< 0.05	0.05 - 0.20	0.2 - 0.4	> 0.4
Alkalinity	CaCO ₃ mg/l	< 40	40 - 75	75 - 120	> 120
Nitrate (NO ₃)	mg/l	< 0.1	0.1 - 0.2	0.2 - 0.3	> 0.3
Phosphate (PO ₄)	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.5
Sulphate (SO ₄)	mg/l	< 20	20 - 45	45 - 70	> 70
Bacteriological					
Faecal coliforms	counts/100ml	< 10	10 - 60	60 - 120	> 120

Sewage Works Compliance to General Standard (GN 1191 Oct 1999)

Variables	Measured as	Acceptable Management Target	Unacceptable
Physical			
Conductivity	mS/m	<150	>=150
pH	pH units	5.5 - 9.5	< 5.5; >9.5
Organic			
Chemical Oxygen Demand (COD)**	mg/l	<75	>=75
Macro Elements			
Ammonia (NH ₄)	mg/l	<3	>=3
Fluoride (F)	mg/l	<1	>=1
Nitrate (NO ₃)	mg/l	<15	>=15
Phosphate (PO ₄)	mg/l	<10	>10
Bacteriological			
Faecal coliforms	counts/100ml	<1000	>=1000

** After removal of algae