



Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment

1 July 2015 - 30 June 2016

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	M-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	T. col.
VSS	Sandspruit below Vaal River @ Kliplaatsdrift 27°12'30.82"S 29°26'12.83"E	<0.5	9	0.26	178	0.18	0.20	34	12	40	8.35	
		<0.2	15	0.32	190	4.20	<0.1	41	15	47	8.55	
		0.78	9	0.42	72	1.30	0.28	44	18	53	6.02	
		0.41	10	0.52	193	0.29	<0.1	43	18	48	8.5	
KB	Klip River @ Barnardskop 27°28'12.33"S 29°36'1.76"E	<0.2	11	0.23	117	<0.1	<0.1	20	15	30	7.83	
		0.46	5	0.28	54	0.36	0.20	18	20	21	7.50	
		1.30	5	0.28	59	0.43	<0.1	17	13	17	7.61	
KW	Klip @ Winkelhaak 27°14'41.55"S 29°23'59.91"E	<0.2	19	0.45	63	1.20	<0.2	58	18	29	7.63	
KD	Klip River @ De Langesdrift 27°10'57.77"S 29°14'5.54"E	<0.2	10	0.24	215	0.15	<0.1	16	20	48	8.09	
		0.27	15	0.49	247	1.51	<0.2	19	13	51	8.17	
		0.33	7	0.38	90	0.31	0.22	25	17	26	7.65	
		0.52	15	0.33	115	0.42	<0.1	22	19	26	7.85	
KSV	Spruitsonderdrift downstream of Vrede 27°21'8.15"S 29°10'16.87"E	<0.2	49	0.34	262	6.43	0.66	63	27	67	7.78	
		<0.2	50	0.56	345	1.37	1.00	32	31	80	8.22	
		1.40	19	0.40	161	0.83	0.53	34	28	56	8.33	
		1.72	40	0.43	277	0.93	0.4	42	31	69	8.62	
VDS	Vaal River downstream of Standerton 27° 0'55.97"S 29° 1'29.30"E	<0.2	23	0.26	118	0.50	0.25	42	21	34	7.76	
		<0.5	20	0.48	110	2.00	<0.2	37	21	32	7.55	
		<0.2	7	0.35	56	0.28	0.20	23	23	26	7.36	
		8.15	33	0.46	127	0.37	0.39	44	22	36	7.82	
VGB	Gladdedrift Bridge @ Villiers 26°53'21.24"S 28°43'47.18"E	<0.2	16	0.29	128	0.49	<0.2	36	23	38	8.07	
		1.30	15	0.40	143	0.41	<0.2	40	31	39	8.06	
		<0.2	27	0.33	66	1.85	<0.2	42	33	29	7.48	
		<0.2	10	0.40	94	0.43	0.10	26	28	27	7.88	
VV	Vaal @ Villiers 27° 1'20.13"S 28°36'0.32"E	0.31	22	0.32	141	0.25	<0.1	36	21	40	8.27	490
		2.73	23	0.50	143	1.02		47	23	49	7.79	1204
		<0.2	13	0.43	100	0.96	0.18	34	30	31	7.93	507
		0.30	12	0.25	93	0.53	0.12	29	26	29	7.90	1709
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26°53'27.99"S 28°15'0.16"E	0.10	10	0.27	80	0.51	<0.1	21	26	22	7.90	1
		2.00	8	0.45	89	0.19	0.46	19	20	24	7.95	4
		<0.2	13	0.40	113	0.19	0.23	21	17	31	8.07	125
		0.26	10	0.41	86	1.04	0.14	29	20	26	7.94	4
WF	Wilge River @ Frankfort 27°16'18.00"S 28°29'28.41"E	0.10	4	0.22	43	0.69	<0.1	8	18	12	7.49	126
		2.00	1	0.95	68	0.30	<0.2	6	22	16	7.65	190
		<0.2	3	0.33	51	0.64	0.30	8	25	14	7.46	634
		0.26	2	<0.15	42	0.88	0.10	6	14	11	7.58	4056
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26°59'1.64"S 28°13'25.08"E	0.33	10	0.23	59	15.58	<0.1	17	18	15	7.57	18
		1.47	3	0.61	57	0.19	0.23	8	16	14	7.96	9
		0.29	5	0.23	53	0.16	0.28	15	16	15	7.89	233
		0.23	10	0.49	49	0.46	<0.1	9	15	13	7.98	11
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26°53'48.81"S 28°11'9.92"E	<0.2	6	0.24	67	0.22	<0.1	17	20	19	7.87	2
		0.78	4	0.48	62	0.31	0.24	11	13	17	7.92	4
		0.41	4	0.27	64	0.37	0.26	9	11	18	7.90	109
		<0.2	6	0.40	62	0.45	<0.1	10	11	22	7.30	3
VD1I	Vaal Dam 1 Integrated @ RW intake 26°53'0.26"S 28° 7'14.35"E	9.20	10	0.24	70	3.57	0.80	20	18	20	7.86	9
		<0.5	5	0.30	67	0.39	0.50	47	14	20	8.02	8
		0.34	6	0.30	66	1.03	0.41	11	14	19	7.93	611
		0.44	5	1.87	66	0.39	0.17	13	14	20	7.91	8
C-KLIPR_VDAM	Klip River inflow to VaalDam 27°07'43.93"S 28° 17'01.47"E	0.26	12	0.28	132	0.32	0.10	18	36	33	8.00	
		1.45	15	0.49	183	1.66	0.54	22	34	49	7.97	
		2.00	36	0.40	85	6.34	1.25	38	29	34	7.57	
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	<0.2	43	0.30	88	6.14	0.70	67	57	60	7.48	513
		13.30	40	0.58	212	12.00	3.03	54	329	68	7.46	675672
		11.43	49	0.35	117	1.50	1.97	62	58	52	7.49	20897
		18.60	70	0.36	200	1.41	4.40	59	68	76	7.39	810
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	12.05	34	0.23	135	7.70	2.95	28	52	53	7.50	19914
		6.22	56	0.34	105	9.80	2.86	35	59	46	7.38	14187
		3.11	29	0.26	77	9.22	2.63	39	42	43	7.18	4910
		7.08	28	0.19	79	11.10	2.48	30	57	43	7.16	14936
S-FRANKF_NAMA HA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	15	32	<0.15	160	3.30	3.43	34	112	55	7.63	1681
		11.13	32	0.40	139	3.38	3.25	32	66	49	7.72	118
		10.40	32	0.17	101	4.33	3.96	41	27	44	7.40	138120
		11.65	46	0.34	115	6.12	3.30	32	50	52	7.45	96
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	8.80	66.67	0.28	202	4.51	3.92	40	91	75	7.82	203
		3.75	74	0.43	208	6.55	3.53	67	76	79	7.79	628
		<0.2	96	0.41	92	<0.1	4.10	11	43	69	8.34	461
		0.47	100	0.31	154	0.21	2.90	17	104	66	7.68	1557
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	13.14	36	0.27	103	28.94	3.93	37	57	48	7.37	253.651
		9.26	26	0.80	92	10.03	3.55	20	38	43	7.20	270987
		8.38	28	0.19	87	6.87	3.12	26	35	41	7.53	306842
		12.47	29	0.32	111	6.58	3.33	26	38	46	7.26	275577
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	15.2	37	0.23	143	5.44	2.33	34	30	53	7.74	847
		0.36	54	0.34	71	12.96	1.63	48	22	54	7.62	912
		<0.5	32	0.26	70	16.47	2.53	36	24	48	7.57	33
		0.10	32	0.18	74	13.00	3.10	49	30	56	7.30	9
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	26.00	38	0.28	307	2.30	4.05	34	231	97	7.68	2404283
		2.73	23	0.50	143	1.02	33.85	47	23	49	7.79	1204
		23.40	83	0.44	246	5.09	4.00	51	89	86	7.40	851420
		26.17	75	0.41	267	2.42	4.48	52	158	95	7.34	1541443






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	E. coli			
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	<0.2	43	0.30	88	6.1	0.70	67	57	60	7.48	512.6666667
		13.30	40	0.58	212	12.0	3.03	54	329	68	7.46	675672
		11.43	49	0.35	117	1.5	1.97	62	58	52	7.49	20897
		18.60	70	0.36	200	1.4	4.40	59	68	76	7.39	810
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	12.05	34	0.23	135	7.7	2.95	28	52	53	7.50	19914
		6.22	56	0.34	105	9.8	2.86	35	59	46	7.38	14187
		3.11	29	0.26	77	9.2	2.63	39	42	43	7.18	4910
		7.08	28	0.19	79	11.1	2.48	30	57	43	7.16	14936
S-FRANKF_NAMAHA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	14.90	32	<0.15	160	3.3	3.43	34	112	55	7.63	1681
		11.13	32	0.40	139	3.4	3.25	32	66	49	7.72	118
		10.40	32	0.17	101	4.3	3.36	41	27	44	7.40	138120
		11.65	46	0.34	115	6.1	3.30	32	50	52	7.45	96
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	8.80	67	0.28	202	4.5	3.92	40	91	75	7.82	202.8333333
		3.75	74	0.43	208	0.5	3.53	67	76	79	7.79	628
		<0.2	96	0.41	92	<0.1	4.10	11	43	69	8.34	461
		0.47	100	0.31	154	0.2	2.90	17	104	66	7.68	1557
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	13.14	36	0.27	103	28.9	3.93	37	57	48	7.37	253.651
		9.26	26	0.80	92	10.0	3.55	20	38	43	7.20	270987
		8.38	28	0.19	87	6.9	3.12	26	35	41	7.53	306842
		12.47	29	0.32	111	6.6	3.33	26	38	46	7.26	275577
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	15.15	37	0.23	143	5.4	2.33	34	30	53	7.74	846.5
		0.36	54	0.34	71	13.0	1.63	48	22	54	7.62	912
		<0.5	32	0.26	70	16.5	2.53	36	24	48	7.57	32.5
		0.10	32	0.18	74	13.0	3.10	49	30	56	7.30	9
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	26.00	38	0.28	307	2.3	4.05	34	231	97	7.68	2404283
		2.73	23	0.50	143	1.0	33.85	47	23	49	7.79	1204
		23.40	83	0.44	246	5.1	4.00	51	89	86	7.40	651420.2
		26.17	75	0.41	267	2.4	4.5	52	158	95	7.34	1541443

Key

VD11	Vaal Dam 1 Integrated @ RW intake	0.12	-	1 July 15 - 30 Sept 15
		0.12	-	1 Oct 1 - 31 Dec 15
		0.12	-	1 Jan 16 - 31 Mar 16
		0.12	-	1 Apr 16 - 30 Jun 16

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