



Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment

1 April 2016 - 31 March 2017






Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	W-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	T. coli
VSS	Sandspruit below Vaal River @ Kliplaatsdrift 27°12'30.82"S 29°26'12.83"E	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	8.48	
		0.91	21	0.40	218	0.57	0.13	61	19	52	8.67	
		0.2	11	0.23	69	0.21	0.1	24	24	22	7.40	
KB	Klip River @ Barnardskop 27°28'12.33"S 29°36'1.76"E	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	
		<0.2	6	0.23	90	<0.1	<0.1	8	12	23	7.66	
		0.2	<10	0.20	45	0.10	0.1	12	27	15	7.00	
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	
		0.2	<10	0.22	39	0.10	0.1	7	12	12	7.20	
KD	Klip River @ De Langesdrift 27°10'57.77"S 29°14'5.54"E	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	
		<0.2	11	0.33	183	<0.1	0.11	21	13	45	8.06	
		0.2	<10	0.16	42	0.10	0.1	9	27	59	6.60	
KSV	Spruitsonderdrift downstream of Vrede 27°21'8.15"S 29°10'16.87"E	1.40	19	0.40	161	0.83	0.53	34	28	56	8.33	
		1.72	40	0.43	277	0.93	0.40	42	31	69	8.62	
		0.48	43	0.36	212	2.67	0.91	72	36	71	8.09	
		0.20	18	0.24	105	0.48	0.1	25	32	75	7.10	
VDS	Vaal River downstream of Standerton 27°0'55.97"S 29°1'29.30"E	<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	
		<0.2	25	0.43	132	<0.1	0.20	36	19	37	8.00	
		0.20	11	0.23	75	0.17	0.10	21	23	23	7.40	
VGB	Gladdedrift Bridge @ Villiers 26°59'31.24"S 28°43'47.18"E	<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	
		<0.2	13	0.27	147	<0.1	<0.1	29	22	42	8.46	
		0.34	11	0.38	72	0.15	0.1	37	24	22	7.50	
VV	Vaal @ Villiers 27°1'20.13"S 28°36'0.32"E	<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
		<0.2	19	0.24	127	<0.1	<0.1	44	22	40	8.28	48
		0.31	12	0.30	68	0.67	0.10	26	27	24	7.30	1370
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26°53'27.99"S 28°15'0.16"E	<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
		0.71	15	0.31	96	1.01	6.55	31	22	27	8.16	44
		0.2	12	0.28	55	0.67	0.1	30	23	18	7.80	205
WF	Wilge River @ Frankfort 27°16'18.00"S 28°29'28.41"E	<0.2	3	0.33	51	0.64	0.30	8	25	14	7.46	834
		0.26	2	<0.15	42	0.88	0.10	6	14	11	7.58	4056
		0.71	7	0.20	40	1.16	0.24	9	26	11	7.57	573
		0.2	<10	0.18	53	0.17	0.1	8	14	16	7.40	550
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26°59'1.64"S 28°13'25.08"E	0.29	2	0.23	53	0.16	0.28	15	16	15	7.89	233
		0.23	5	0.49	49	0.46	<0.1	9	15	13	7.98	1
		<0.2	11	0.22	52	0.77	0.28	18	12	14	7.84	4
		0.2	13	0.25	42	0.51	0.1	25	12	12	7.90	38
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26°53'48.81"S 28°11'9.92"E	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	16	7.93	1
		<0.2	13	0.24	49	2.76	0.19	25	15	13	7.62	8
		0.20	<10	0.33	48	0.97	0.1	84	13	22	7.30	3
VD1I	Vaal Dam 1 Integrated @ RW intake 26°53'0.26"S 28°7'14.35"E	0.34	6	0.30	66	1.03	0.41	11	14	19	7.93	811
		0.44	5	1.87	66	0.39	0.17	13	14	20	7.91	8
		8.90	23	0.30	57	1.23	0.77	32	11	19	7.34	16
		0.2	21	0.23	50	0.80	0.1	29	10	15	7.70	12
C-KLIPR_VDAM	Klip River inflow to VaalDam 27°07'43.93"S 28°17'01.47"E	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	
		0.20	26	0.24	62	1.60	0.10	24	26	18	7.30	
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	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
		16.53	60	0.25	170	4.60	3.03	67	50	72	7.15	80663
		18.00	65	0.58	180	6.10	1.80	74	46	61	7.20	664530
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	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
		10.53	27	0.23	94	9.65	2.57	31	43	44	7.14	119053
		6.80	38	0.18	125	3.60	2.60	52	36	52	8.10	4170
S-FRANKF_NAMA HA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	10.40	32	0.17	101	4.33	3.36	41	27	44	7.40	138120
		11.65	46	0.34	115	6.12	3.30	32	50	52	7.45	96
		15.60	41	0.33	122	8.72	3.84	39	42	54	7.49	860
		6.80	53	0.16	165	0.93	4.20	59	39	58	7.80	180
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	<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
		2.48	83	0.27	185	1.13	3.54	28	62	68	8.27	1111
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	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
		15.40	26	0.30	99	7.20	3.94	23	28	44	7.15	242246
		7.40	49	0.18	125	7.60	3.40	45	46	56	7.70	110480
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	<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
		0.21	33	0.23	46	4.00	3.40	44	18	49	7.20	1130
		0.29	51	0.21	185	5.50	1.40	49	18	69	7.60	860
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	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
		32.17	96	0.34	300	0.12	2.86	60	191	108	7.37	132340
		19.00	94	0.24	175	0.30	0.36	52	82	67	7.20	196300

Sewage Works Compliance (where applicable) to General Standard (GN 1191 Oct 1999)												
Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	M-Alkalinity	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	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
		16.53	60	0.25	170	4.6	3.03	67	50	72	7.15	80663
		18.00	65	0.58	180	6.1	1.80	74	46	61	7.20	664530
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	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
		10.53	27	0.23	94	9.7	2.57	31	43	44	7.14	119053
		6.80	38	0.18	125	3.6	2.60	52	36	52	8.10	4170
S-FRANKF_NAMAHA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	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
		15.60	41	0.33	122	8.7	3.84	39	42	54	7.49	860
		6.80	53	0.16	165	0.9	4.20	59	39	58	7.80	180
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	<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
		2.48	83	0.27	185	1.1	3.54	28	62	68	8.27	1111
		8.38	28	0.19	87	6.9	3.12	26	35	41	7.53	306842
S-ORANJEVILLE	WWTW 26°58'47.06"S 28°12'35.72"E	12.47	29	0.32	111	6.6	3.33	26	38	46	7.26	275577
		15.40	26	0.30	99	7.2	3.94	23	28	44	7.15	242246
		7.49	49	0.18	125	7.6	3.40	45	46	56	7.70	110480
		<0.5	32	0.26	70	16.5	2.53	36	24	48	7.57	33
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	0.10	32	0.18	74	13.0	3.10	49	30	56	7.30	9
		0.21	33	0.23	46	4.0	3.40	44	18	49	7.20	1130
		0.29	51	0.21	185	5.5	1.40	49	18	69	7.60	860
		23.40	83	0.44	246	5.1	4.00	51	89	86	7.40	651420
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	26.17	75	0.41	267	2.4	4.48	52	158	95	7.34	1541443
		32.17	96	0.34	300	0.1	2.85	60	191	108	7.37	132340
		19.00	94	0.24	175	0.3	0.36	52	82	67	7.20	196300

**Key**

VD11	Vaal Dam 1 Integrated @ RW intake	0.12	-	1 Apr 16 - 30 Jun 16
		0.12	-	1 July 16 - 30 Sept 16
		0.12	-	1 Oct 2016 - 31 Dec 2016
		0.12	-	1 Jan 17 - 31 Mar 17

**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
<b>Physical</b>					
Conductivity	mS/m	< 10	10 - 30	30 - 45	> 45
pH	pH units	6.5 - 8.5			< 6.5; > 8.5
<b>Organic</b>					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 15	15 - 20	> 20
<b>Macro Elements</b>					
Ammonia (NH <sub>4</sub> )	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 <sub>3</sub> mg/l	< 40	40 - 75	75 - 120	> 120
Nitrate (NO <sub>3</sub> )	mg/l	< 0.1	0.1 - 0.2	0.2 - 0.3	> 0.3
Phosphate (PO <sub>4</sub> )	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.5
Sulphate (SO <sub>4</sub> )	mg/l	< 20	20 - 45	45 - 70	> 70
<b>Bacteriological</b>					
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
<b>Physical</b>			
Conductivity	mS/m	<150	>=150
pH	pH units	5.5 - 9.5	< 5.5; >9.5
<b>Organic</b>			
Chemical Oxygen Demand (COD)**	mg/l	<75	>=75
<b>Macro Elements</b>			
Ammonia (NH <sub>4</sub> )	mg/l	<3	>=3
Fluoride (F)	mg/l	<1	>=1
Nitrate (NO <sub>3</sub> )	mg/l	<15	>=15
Phosphate (PO <sub>4</sub> )	mg/l	<10	>10
<b>Bacteriological</b>			
Faecal coliforms	counts/100ml	<1000	>=1000

\*\* After removal of algae