

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	E.coli	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
VSS	Sandspruit below Vaal River @ Klipplaatsdrift 27° 12.508'S 29° 26.225'E	1	0.14	14	12	36		0.55	132	<0.50	7.9	<0.25	45
		2	0.52	14	13	39		0.55	145	<0.50	8.2	<0.25	37
		3	0.02	15	16	122		0.51	158	<0.50	5.9	<0.25	39
		4	0.09	220	8	22		0.85	65	2.60	7.1	<0.25	39
KB	Klip River @ Barnardskop 27° 28.203'S 29° 36.032'E	1	0.07	13	6	14		0.22	49	<0.5	7.5	<0.25	7
		2	0.03	11	5	13		<0.2	30	<0.50	7.3	<0.25	6
		3	0.02	27	6	18		0.24	52	<0.50	7.5	<0.25	5
		4	0.11	60	12	20		0.39	51	<0.50	7.3	<0.25	24
KW	Klip @ Winkelhaak 27° 14.694'S 29° 23.996'E	1	0.09	13	12	27		0.53	106	0.60	7.7	<0.25	20
		2											
		3											
		4	0.19	28	12	53		0.48	134	<0.50	7.5	<0.25	18
KD	Klip River @ De Langesdrift 27° 10.964'S 29° 14.097'E	1	0.13	13	10	28		0.48	114	0.61	7.6	<0.25	27
		2	0.01	12	7	20		0.27	84	<0.50	7.7	<0.25	14
		3	0.04	22	10	41		0.37	163	<0.50	8.1	<0.25	15
		4	0.10	36	9	41		0.68	155	1.70	7.3	<0.25	32
KSV	Spruitsonderdrift downstream of Vrede 27° 21.137'S 29° 10.281'E	1	0.04	31	21	49		0.40	183	0.90	7.7	0.30	24
		2	0.08	23	45	65		0.60	166	0.83	8.1	<0.25	55
		3	0.05	30	57	83		0.76	118	1.93	8.5	0.56	62
		4	1.73	42	57	63		1.36	138	0.80	7.7	2.23	40
VDS	Vaal River downstream of Standerton 27° 0.933'S 29° 1.488'E	1	0.07	20	16	31		0.45	113	0.78	7.4	<0.25	29
		2	0.05	18	16	30		0.44	105	<0.50	7.8	<0.25	29
		3	0.09	35	24	44		0.53	162	<0.50	8.2	<0.25	35
		4	0.49	38	30	45		0.71	148	0.67	7.6	<0.25	46
VGB	Gladdedrift Bridge @ Villiers 26° 59.521'S 28° 43.786'E	1	0.04	25	25	42		0.48	153	<0.5	7.8	0.46	41
		2	0.05	19	15	33		0.48	107	<0.50	7.9	<0.25	31
		3	8.52	16	20	40		0.46	145	<0.50	7.9	1.23	35
		4	0.07	20	40	61		0.69	225	<0.50	8.0	<0.25	54
VV	Vaal @ Villiers 27° 1.389'S 28° 35.631'E	1	0.09	25	34	47	663	0.63	142	1.14	7.6	<0.25	49
		2	0.06	23	20	34	998	0.53	87	0.55	7.5	<0.25	34
		3	0.38	27	29	42	8	0.55	143	<0.50	8.3	<0.25	41
		4	0.51	27	30	41	596	0.72	112	1.93	7.4	0.32	44
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26° 55.366'S 28° 17.219'E	1	0.06	19	13	25	3	0.41	87	<0.50	8.2	<0.25	27
		2	0.06	16	11	23	17	0.40	82	<0.50	8.0	<0.25	24
		3	0.03	18	18	38	0	0.49	114	<0.50	8.0	<0.25	32
		4	0.06	23	22	39	68	0.64	130	0.62	8.2	0.27	49
WF	Wilge River @ Frankfort 27° 16.311'S 28° 29.489'E	1	0.05	20	4	12	312	0.21	48	<0.50	7.6	<0.25	8
		2	0.05	14	3	18	1 323	0.27	54	<0.50	7.4	<0.25	9
		3	0.30	11	3	14	597	0.21	53	<0.50	7.6	<0.25	7
		4	0.09	22	9	21	537	0.20	91	<0.50	7.7	<0.25	14
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26° 56.208'S 28° 12.699'E	1	0.05	11	4	14	3	0.27	56	<0.50	7.9	<0.25	14
		2	0.09	20	5	15	21	0.26	55	<0.50	7.9	<0.25	18
		3	0.03	16	20	17	0	0.39	65	1.03	7.8	<0.25	22
		4	0.05	21	5	16	4	0.25	59	<0.50	8.0	<0.25	15
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26° 54.484'S 28° 11.933'E	1	0.05	12	6	17	1	0.28	62	<0.50	8.0	<0.25	16
		2	0.03	11	5	16	53	0.30	59	<0.50	7.8	<0.25	17
		3	1.13	31	6	15	1	0.29	59	<0.50	7.8	<0.25	14
		4	0.07	29	8	19	7	0.36	65	0.72	7.9	<0.25	22



Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment

01 Jan 2019 - 31 Dec 2019

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	E.coli	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
VD11	Vaal Dam 1 Integrated @ RW Intake	1	0.56	13	7	18	4	0.28	62	<0.5	7.9	<0.25	22
		2	0.04	11	7	20	8	0.30	61	0.63	7.8	<0.25	17
		3	0.04	11	5	15	0	0.30	62	<0.5	7.7	<0.25	15
	26° 53.075'S 28° 7.329'E	4	2.82	11	6	17	3	0.31	62	<0.5	7.9	<0.25	18
KLIPR_VDAM	Klip River inflow to Vaal Dam	1	0.19	69	10	20		0.48	69	1.10	7.4	<0.25	22
		2	0.35	34	13	61		0.50	76	0.58	7.4	0.31	25
		3	0.04	36	10	28		0.37	103	<0.5	7.7	<0.25	19
	27° 7.735'S 28° 17.028'E	4	0.10	34	17	36		0.42	125	0.60	7.6	<0.25	26

Key

VD11	Vaal Dam 1 Integrated @ RW Intake	1	0.56	- 1 Jan to 31 Mar 2019
		2	0.04	- 1 Apr to 30 Jun 2019
		3	0.04	- 1 Jul to 30 Sept 2019
		4	2.82	- 1 Oct to 31 Dec 2019

Water Quality Guidelines

	- Ideal
	- Acceptable
	- Tolerable
	- Unacceptable



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

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	Faecal coliforms	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate	
S-ST_NEW	Standerton Sewage Works 26° 58.453'S 28° 12.260'E	1	20.33	70	57	78	1 035 400	0.73	283	<0.5	7.3	2.90	40	
		2	14.02	153	64	80	1 643 000	0.88	162	<0.5	7.3	1.68	49	
		3	21.41	266	63	88	2 402 000	1.54	242	<0.5	7.2	2.08	65	
		4	34.00	228	70	93	646 910	1.42	295	<0.5	7.2	2.99	31	
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26° 53.103'S 28° 6.692'E	1	0.82	25	20	28	6 513	0.53	56	4.85	7.2	1.40	26	
		2	0.22	12	8	20	2	0.25	60	<0.5	7.4	<0.25	13	
		3	6.70	90	28	42	17 077	0.67	99	5.43	7.6	1.82	30	
		4	7.05	121	34	46	115 864	1.40	130	2.65	7.4	2.30	35	
S-FRANKF_NAMAHA	Final Effluent of Frankfort Namahadi 27° 15.691'S 28° 29.503'E	1	4.25	30	42	51	17	0.70	113	12.00	7.4	3.30	43	
		2	5.98	27	40	56	61	0.98	132	8.98	7.3	2.20	48	
		3												
		4	8.45	68	47	67	48	1.45	193	7.10	7.7	1.70	57	
S-FRANKF_OXLP	Final Effluent of Frankfort Oxidation Ponds 27° 17.453'S 28° 29.276'E	1	1.20	100	38	44	104	0.55	152	0.59	8.9	1.19	27	
		2	1.90	185	42	52	1 664	0.65	153	2.60	7.7	2.34	44	
		3	5.40	94	56	67	4 883	0.85	226	1.01	7.6	2.07	37	
		4	0.99	167	70	68	7 860	1.01	223	1.18	8.0	1.83	38	
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26° 58.804'S 28° 12.597'E	1	6.60	56	37	50	2 257 245	0.71	127	6.83	7.2	2.57	28	
		2	9.00	27	34	46	202 723	0.84	86	11.72	7.2	4.72	27	
		3	13.20	31	39	51	112 110	0.87	92	13.96	7.3	3.24	23	
		4	8.07	75	45	58	668 424	1.14	121	18.00	7.6	2.87	33	
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26° 53.324'S 28° 12.838'E	1	7.94	39	57	69	154 021	0.92	215	2.56	7.7	4.36	41	
		2	5.15	20	52	56	205	0.96	99	12.00	7.5	2.90	56	
		3	2.51	31	50	60	14	0.92	97	18.42	7.4	2.73	52	
		4	5.00	68	61	65	22	1.10	153	6.90	7.6	3.71	60	
S-VILLIERS	Final Effluent of Villiers WWTW 27° 1.908'S 28° 35.366'E	1	9.55	209	109	113	469 300	0.84	328	0.78	7.4	3.42	79	
		2	14.80	132	91	89	1 543	1.31	169	1.55	7.4	2.74	79	
		3	22.43	122	88	104	2 843	1.26	126	1.58	7.6	2.45	77	
		4	12.70	208	90	104	26 663	0.47	315	0.56	7.7	3.76	57	

Key

S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26° 53.324'S 28° 12.838'E	1	7.94	- 1 Jan to 31 Mar 2019
		2	5.15	- 1 Apr to 30 Jun 2019
		3	2.51	- 1 Jul to 30 Sept 2019
		4	5.00	- 1 Oct to 31 Dec 2019

Water Quality Guidelines

	- Acceptable
	- Unacceptable

In-stream Water Quality 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	> 1.0
Chloride (Cl)	mg/l	< 25	25 - 50	50 - 75	> 75
Fluoride (F)	mg/l	< 0.05	0.05 - 0.20	0.20 - 0.40	> 0.40
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	> 0.50
Sulphate (SO ₄)	mg/l	< 20	20 - 45	45 - 70	> 70
Bacteriological					
<i>E.coli</i>	counts/100ml	< 10	10 - 60	60 - 120	> 120
<i>Faecal coliforms</i>	counts/100ml		< 126	126 - 1000	> 1000

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			
<i>Faecal coliforms</i>	counts/100ml	< 1,000	>= 1,000

*After removal of algae

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