



Quarterly Water Quality Status of the Waterval River Catchment

1 July 2012 - 30 June 2013

In-stream Water Quality Guidelines

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	E. coli
WAW	Winkelhaakspruit @ Secunda 26°31'12.14"S 29° 4'17.79"E	12.00	59	0.33	185	3.20	4.60	50	43	71	7.40	
		2.70	57	0.40	195	2.70	3.00	70	41	70	7.60	
		3.10	38	0.46	150	2.60	2.40	32	24	78	7.90	
		7.80	65	0.42	150	2.60	2.80	64	41	78	7.40	
WAB	Kleinspruit @ Secunda 26°32'44.49"S 29° 7'46.66"E	0.12	19	0.54	195	1.60	0.10	63	19	50	6.20	
		0.12	27	0.57	155	7.50	0.14	125	21	68	7.80	
		1.40	26	0.52	150	10.00	0.28	96	23	80	8.00	
		0.10	25	0.65	145	2.70	0.16	71	20	56	7.80	
WAT	Kleinspruit @ Secunda 26°33'9.73"S 29° 4'58.31"E	0.58	31	0.51	150	1.10	0.29	67	25	54	7.30	
		0.81	34	0.53	155	5.90	0.23	96	22	56	7.60	
		0.61	18	0.68	195	3.60	0.19	64	18	59	7.80	
		0.44	30	0.50	155	1.90	0.17	75	22	54	7.70	
WAR	Waterval River @ Roodebank 26°37'44.10"S 29° 1'32.31"E	5.90	42	0.58	185	1.10	2.80	62	30	63	7.30	
		1.90	51	0.67	200	3.90	0.79	95	32	52	7.60	
		2.90	24	0.54	115	7.10	0.48	97	25	57	7.70	
		3.10	38	0.56	170	1.30	0.57	70	32	59	7.50	
WAE	Waterval River @ Elandslaagte 26°51'30.04"S 28°53'23.52"E	0.72	44	0.42	165	1.10	1.80	69	31	57	8.20	
		0.50	43	0.57	125	1.90	0.61	100	30	54	7.40	
		1.80	28	0.40	115	0.77	0.43	44	26	43	7.40	
		0.10	38	0.51	130	1.80	0.07	70	29	51	7.60	
S-EVAN_W	Evander Sewage Works 26°29'32.97"S 29° 6'54.97"E	13.00	42	0.30	210	2.20	2.90	41	99	69	7.40	1260490
		7.70	42	0.58	160	8.80	4.20	64	74	67	7.40	495390
		9.60	55	0.51	175	2.70	2.50	67	105	76	7.40	938300
		10.00	37	0.33	240	0.42	2.90	49	110	70	7.60	1613070
S-SEC_LOC	Embalenhle Sewage Works 26°33'21.66"S 29° 4'16.66"E	13.00	57	0.27	340	3.40	8.30	58	105	87	7.50	177120
		16.00	62	0.22	330	0.35	7.30	67	105	91	7.40	523580
		20.00	54	0.21	310	0.18	4.20	55	79	85	7.90	328820
		30.00	81	0.28	1400	0.27	5.30	84	170	105	7.50	69650
S-SEC_SEW	Secunda Sewage Works* 26°32'21.04"S 29° 8'42.00"E	0.19	53	0.32	155	1.40	0.46	75	69	67	7.50	0
		1.10	43	0.44	185	1.80	0.28	90	43	65	8.00	810
		0.34	50	0.44	150	2.50	0.38	77	28	64	7.60	22

\*The above colour coding is as per the Waterval River Instream Water Quality Guideline and not Water Use License conditions for any mining/ industries.

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-EVAN_W	Evander Sewage Works 26°29'32.97"S 29° 6'54.97"E	13.00	35	0.30	210	2.20	2.90	31	99	69	7.40	1260490
		7.70	42	0.58	210	8.80	4.20	41	74	67	7.40	495390
		9.60	42	0.51	160	2.70	2.50	64	105	76	7.40	938300
		10.00	55	0.33	175	0.42	2.90	67	110	70	7.60	1613070
S-SEC_LOC	Embalenhle Sewage Works 26°33'21.66"S 29° 4'16.66"E	13.00	63	0.27	215	3.40	6.30	65	105	87	7.50	177120
		16.00	57	0.22	340	0.35	7.30	58	105	91	7.40	523580
		20.00	62	0.21	330	0.18	4.20	67	79	85	7.90	328820
		30.00	54	0.28	310	0.27	5.30	55	170	105	7.50	69650
S-SEC_SEW	Secunda Sewage Works* 26°32'21.04"S 29° 8'42.00"E	10.00	42	0.28	120	1.40	2.40	58	31	58	7.00	8
		0.19	57	0.32	135	1.00	0.46	57	59	67	7.50	0
		1.10	53	0.44	170	1.80	0.28	73	43	65	8.00	810
		0.34	43	0.44	185	2.50	0.38	90	28	64	7.60	22

\* Applicable Water Quality Standards for final effluent discharge from Secunda Sewage Works (as per DWA licence)

Key

WAB	Bossiespruit @ Secunda	0.59	-	1 July 12 - 30 Sept 12
		0.12	-	1 Oct 12 - 31 Dec 12
		2.1	-	1 Jan 13 - 31 Mar 13
		0.28	-	1 Apr 13 - 30 Jun 13

Water Quality Guidelines

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

In-stream Water Quality Guidelines for the Waterval 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>3</sub> )	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	0.2 - 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	> 0.50
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

\* Applicable Water Quality Standards for final effluent discharge from Secunda Sewage Works (as per DWA licence)

Variable	Limit
pH	5.5 - 9.5
Electrical Conductivity	≤ 70 mS/m
Chemical Oxygen Demand	≤ 75 mg/l
Ammonia as N	≤ 6 mg/l
Nitrate / Nitrite as Nitrogen	≤ 15 mg/l
Orthophosphate as P	≤ 10 mg/l
Fluoride	≤ 1 mg/l
Faecal coliform units (FCU)	0 per 100ml

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>3</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