

b.n. kirk (natal) cc

Reg. No. CK 1994/015428/23

Water, Sewage & Industrial Effluent Testing Laboratory

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CERTIFICATE OF ANALYSIS - BN Kirk (Natal) cc

CLIENT:	Ilembe District Municipality	JOB NO:	W 5-1
WORKS:	WOSIYANE WATER TREATMENT WORKS		
ADDRESS:	P.O. Box 1788 Kradukuza 4450		
ATTENTION:	<i>Mr. H.N. Maphumulo</i>	REPORT DATE:	25-04-2014
eMail:	Group 4 Details	DATE ANALYSED:	23-04-2014
In accordance with the visit schedule and procedure QP21.		DATE RECEIVED:	16-04-2014

ANALYTICAL RESULTS

1	2	3	4	2014													
Determinand	Test Method No	SANS 241-1:2011 Physical, aesthetic, operational, chemical and Microbiological determinands				Date Sampled											
		Risk	Unit	Standard limits ^a	% Compliance	08-01	22-01	06-02	19-02	05-03	19-03	02-04	15-04				

RAW WATER

Physical and aesthetic determinands

pH at 25°C ^c	P09/042	<i>Operational</i>	<i>pH units</i>			7.6		Plant	Plant	Not	Not	Not	7.8						
Colour	P09/011	<i>Aesthetic</i>	<i>mg/L Pt-Co</i>			38		Not In	Not In	Monitored	Monitored	Monitored	22						
Turbidity ^b {A}	P09/045	<i>Operational</i>	<i>NTU</i>			4.8		Operation	Operation				2.8						
		<i>Aesthetic</i>	<i>NTU</i>			4.8							2.8						
Conductivity at 25°C	P09/044	<i>Aesthetic</i>	<i>mS/m</i>			15							15						
Total Dissolved Solids {A}	P09/031	<i>Aesthetic</i>	<i>mg/L</i>			64							104						

Chemical determinands - micro-determinands

Iron as Fe	P09/014	<i>Chronic health</i>	<i>mg/L</i>			0.41							0.40						
		<i>Aesthetic</i>	<i>mg/L</i>			0.41								0.40					
Manganese as Mn	P09/015	<i>Chronic health</i>	<i>mg/L</i>			0.02							0.01						
		<i>Aesthetic</i>	<i>mg/L</i>			0.02								0.01					

FINAL WATER																
Physical and aesthetic determinands																
pH at 25°C ^c	P09/042	Operational	pH units	≥ 5 to ≤ 9.7	100%	7.5	7.6									7.8
Colour	P09/011	Aesthetic	mg/L Pt-Co	≤ 15	0%	39										25
Turbidity ^b {A}	P09/045	Operational	NTU	≤ 1	0%	4.5										2.4
		Aesthetic	NTU	≤ 5	100%	4.5										2.4
Conductivity at 25°C	P09/044	Aesthetic	mS/m	≤ 170	100%	15										15
Total Dissolved Solids {A}	P09/031	Aesthetic	mg/L	≤ 1200	100%	54										94
Total Chlorine	-	ns	ns	ns		0.06	0.04									0.14
Free chlorine	P09/025	Chronic health	mg/L	≤ 5	100%	0.04	0.04									0.10
Monochloramine	P09/025	Chronic health	mg/L	≤ 3	100%	0.02	0.00									0.04
Chemical determinands - macro-determinands																
Nitrate as NO ³	P09/018	Acute health - 1	mg/L	ns		1.0										2.7
Nitrate as N ^d	P09/018	Acute health - 1	mg/L	≤ 11	100%	0.23										0.61
Ammonia as NH ³	P09/002	Aesthetic	mg/L	≤ 1.5	100%	<0.1										0.60
Total Hardness as CaCO ³	P09/013	ns	ns	ns		44										48
Calcium Hardness as CaCO ³	P09/005	ns	ns	ns		14										20
Chloride as Cl ⁻ {A}	P09/007	Aesthetic	mg/L	≤ 300	100%	20										25
Calcium as Ca	P09/004	ns	ns	ns		5.6										8.0
Magnesium as Mg	P09/016	ns	ns	ns		7.2										6.7
Sulphate as SO ₄ ²⁻ {A}	P09/035	Acute health - 1	mg/L	≤ 500	100%	3.1										2.4
		Aesthetic	mg/L	≤ 250	100%	3.1										2.4
Chemical determinands - micro-determinands																
Iron as Fe	P09/014	Chronic health	mg/L	≤ 2	100%	0.45										0.37
		Aesthetic	mg/L	≤ 0.3	0%	0.45										0.37
Manganese as Mn	P09/015	Chronic health	mg/L	≤ 0.5	100%	0.02										0.01
		Aesthetic	mg/L	≤ 0.1	100%	0.02										0.01
Aluminium as Al	P09/053	Operational	mg/L	≤ 0.3	100%	not tested	0.97									not tested

^a = The health-related standards are based on the consumption of 2 L of water per day per person of a mass of 60kg over a period of 70 years.

^b = Values in excess of those given in column 4 may negatively impact disinfection.

^c = Low pH values can result in structural problems in the distribution system.

^d = This is equivalent to nitrate at 50mg NO₃⁻ /L and nitrite as 3mg NO₂⁻ /L

^e = Microcystin only needs to be measured where an algal bloom (>20 000 cyanobacteria cells per millilitre) is present in a raw water source. In the absence of algal monitoring, an algal bloom is deemed to occur where the surface water is visibly green in the vicinity of the abstraction, or samples taken have a strong musty odour.

MICROBIOLOGICAL RESULTS																
E.coli ^a {A}	P09/046	Acute health - 1	Count per 100ml	Not detected	0%	732	9						132			
Faecal coliforms ^b {A}	P09/046	Acute health - 1	Count per 100ml	Not detected	0%	732	20						132			
Total coliforms ^c	P09/102	Operational	Count per 100ml	< 10	0%	>10000**	57						281			
Heterotrophic plate count ^f	P09/103	Operational	Count per ml	< 1000	0%	>10000**	>10000**						1928			

Key: nd = not detected ** = too numerous to count

a = Definitive, preferred indicator of faecal pollution.

b = Indicator of unacceptable microbial water quality, could be tested instead of E.coli , but is not the preferred indicator of faecal pollution.

Also provides information on treatment efficiency and aftergrowth in distribution networks.

c = Confirms a risk of human infection and faecal pollution and also provides information on treatment efficiency. The detection of selected viruses confirms faecal pollution of human origin.


d = Confirms a risk of infection and faecal pollution and also provides information on treatment efficiency. The detection of selected protozoan parasites confirms a human health risk.

e = Indicates potential faecal pollution and provides information on treatment efficiency and aftergrowth.


f = Process indicator that provides information on treatment efficiency, aftergrowth in distribution networks and adequacy of disinfectant residuals.

g = Process indicator that provides information on treatment efficiency.

for and on behalf of B N KIRK (Natal)cc



Dawn Bester - Laboratory Manager
Technical Signatory



S. Subban - Chemistry Lab
Supervisor
Technical Signatory

25-04-2014

Date

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Accreditation Disclaimer:

1. Results marked {A} are included in the SANAS Schedule of accreditation for this laboratory.
2. Results marked "Subcontracted Test" in this report, are not included in the SANAS Schedule of accreditation for this laboratory.
3. The estimated uncertainty of measurements for the accredited test results is obtainable from the laboratory - QP24 Appendix A.
4. The results relate to the sample tested and the most recent methods available with a 95% confidence level.

End of Report