

## b.n. kirk (natal) cc

Reg. No. CK 1994/015428/23

Water, Sewage &amp; Industrial Effluent Testing Laboratory

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## CERTIFICATE OF ANALYSIS - BN Kirk (Natal) cc

CLIENT:	iLembe District Municipality	BNK Reference No.:	iLembe/MM33 SANS 09-04-2014
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eMail:	<a href="#">Group 3 Details</a>	DATE RECEIVED	09-04-2014
Analysis Date	14-04-2014	REPORT DATE:	17-04-2014

## ANALYTICAL RESULTS

1	2	3	4		
Determinand	Test Method No	SANS 241-1:2011 Physical, aesthetic, operational, chemical and Microbiological determinands			MM33 Hlanganini Tap
		Risk	Unit	Standard limits <sup>a</sup>	

## Physical and aesthetic determinands



Free chlorine	P09/025	Chronic health	mg/L	≤ 5	0.12
Monochlorine	P09/025	Chronic health	mg/L	≤ 3	0.04
Colour	P09/011	Aesthetic	mg/L Pt-Co	≤ 15	23
Conductivity at 25°C	P09/044	Aesthetic	mS/m	≤ 170	193
Total Dissolved Solids {A}	P09/031	Aesthetic	mg/L	≤ 1200	1178
Turbidity <sup>b</sup> {A}	P09/045	Operational	NTU	≤ 1	8.2
		Aesthetic	NTU	≤ 5	8.2
pH at 25°C <sup>c</sup>	P09/042	Operational	pH units	≥ 5 to ≤ 9.7	7.2

## Chemical determinands - macro-determinands

Nitrate as NO <sup>3</sup>	P09/018	Acute health - 1	mg/L	ns	0.36
Nitrate as N <sup>d</sup>	P09/018	Acute health - 1	mg/L	≤ 11	0.08
Nitrite as N <sup>d</sup>	P09/019	Acute health - 1	mg/L	≤ 0.9	0.02
Sulphate as SO <sub>4</sub> <sup>2-</sup> {A}	P09/035	Acute health - 1	mg/L	≤ 500	68
		Aesthetic	mg/L	≤ 250	68
Fluoride as F <sup>-</sup>	P09/010	Chronic health	mg/L	≤ 1.5	0.20
Ammonia as NH <sup>3</sup>	P09/002	Aesthetic	mg/L	≤ 1.5	<0.1
Chloride as Cl <sup>-</sup> {A}	P09/007	Aesthetic	mg/L	≤ 300	505
Sodium as Na	P09/047	Aesthetic	mg/L	≤ 200	221
Zinc as Zn	P09/047	Aesthetic	mg/L	≤ 5	0.049

## Chemical determinands - micro-determinands

Antimony as Sb	P09/047	Chronic health	mg/L	≤ 0.02	nd
Arsenic as As	P09/089	Chronic health	mg/L	≤ 0.01	nd
Cadmium as Cd	P09/047	Chronic health	mg/L	≤ 0.003	nd
Total Chromium as Cr	P09/047	Chronic health	mg/L	≤ 0.05	0.008
Cobalt as Co	P09/047	Chronic health	mg/L	≤ 0.5	0.004
Copper as Cu	P09/047	Chronic health	mg/L	≤ 2	nd
Cyanide as CN <sup>-</sup>	P09/069	Acute health - 1	mg/L	≤ 0.07	nd
Iron as Fe	P09/014	Chronic health	mg/L	≤ 2	0.52
		Aesthetic	mg/L	≤ 0.3	0.52
Lead as Pb	P09/047	Chronic health	mg/L	≤ 0.01	nd
Manganese as Mn	P09/015	Chronic health	mg/L	≤ 0.5	0.27
		Aesthetic	mg/L	≤ 0.1	0.27
Mercury as Hg	P09/092	Chronic health	mg/L	≤ 0.006	nd
Nickel as Ni	P09/047	Chronic health	mg/L	≤ 0.07	nd
Selenium as Se	P09/090	Chronic health	mg/L	≤ 0.01	nd
Vanadium as V	P09/047	Chronic health	mg/L	≤ 0.2	0.002
Aluminium as Al	P09/053	Operational	mg/L	≤ 0.3	0.03

<b>Chemical determinands - organic determinands</b>					
Total Organic Carbon as C	P09/093	<i>Chronic health</i>	<i>mg/L</i>	$\leq 10$	7.8
<b>Trihalomethanes :</b>					
<i>Chloroform</i>	<i>sub contracted</i>	<i>Chronic health</i>	<i>mg/L</i>	$\leq 0.3$	0.00226
<i>Bromoform</i>	<i>sub contracted</i>	<i>Chronic health</i>	<i>mg/L</i>	$\leq 0.1$	<0.0001
<i>Dibromochloromethane</i>	<i>sub contracted</i>	<i>Chronic health</i>	<i>mg/L</i>	$\leq 0.1$	<0.0001
<i>Bromodichloromethane</i>	<i>sub contracted</i>	<i>Chronic health</i>	<i>mg/L</i>	$\leq 0.06$	<0.0001
Phenols	P09/071	<i>Aesthetic</i>	<i>mg/L</i>	$\leq 0.01$	nd
<p><b>a</b> = 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.</p> <p><b>b</b> = Values in excess of those given in column 4 may negatively impact disinfection.</p> <p><b>c</b> = Low pH values can result in structural problems in the distribution system.</p> <p><b>d</b> = This is equivalent to nitrate at 50mg NO<sub>3</sub><sup>-</sup> /L and nitrite as 3mg NO<sub>2</sub><sup>-</sup> /L</p> <p><b>e</b> = Microcystin only needs to be measured where an algal bloom (&gt;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.</p>					
<b>MICROBIOLOGICAL RESULTS</b>					
E.coli <sup>a</sup> {A}	P09/046	<i>Acute health - 1</i>	<i>Count per 100ml</i>	<i>Not detected</i>	0
Faecal coliforms <sup>b</sup> {A}		<i>Acute health - 1</i>	<i>Count per 100ml</i>	<i>Not detected</i>	16
Total coliforms <sup>c</sup>	P09/102	<i>Operational</i>	<i>Count per 100ml</i>	$< 10$	24
Heterotrophic plate count <sup>f</sup>	P09/103	<i>Operational</i>	<i>Count per ml</i>	$< 1000$	2052
Somatic coliphages <sup>g</sup> <sup>e</sup>	P09/104	<i>Operational</i>	<i>Count per 10ml</i>	<i>Not detected</i>	0
<b>KEY: ns = not specified / nd = not detected</b>					
<p><b>a</b> = Definitive, preferred indicator of faecal pollution.</p> <p><b>b</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.</p> <p><b>c</b> = 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.</p> <p><b>d</b> = 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.</p> <p><b>e</b> = Indicates potential faecal pollution and provides information on treatment efficiency and aftergrowth.</p> <p><b>f</b> = Process indicator that provides information on treatment efficiency, aftergrowth in distribution networks and adequacy of disinfectant residuals.</p> <p><b>g</b> = Process indicator that provides information on treatment efficiency.</p>					
<i>for and on behalf of B N KIRK (Natal) cc</i>					
				17-04-2014	
<i>Dawn Bester</i> <i>Laboratory Manager /</i> <i>Managing Director</i> <i>(CertNatSci 200223/13)</i>		<i>D. Subban - Chemistry Supervisor</i>		<i>Date</i>	
<b>Disclaimer:</b>					
<p>1. While every reasonable precaution is taken in obtaining these results the Company does not accept responsibility for any matters arising from the further use of these results.</p> <p>2. In the case of sample/s submitted by the client, the results expressed in this certificate represent only the sample/s as received.</p> <p>3. This certificate shall not be reproduced except in full, without the written approval of the Company.</p>					
<b>Accreditation Disclaimer:</b>					
<p>1. Results marked {A} are included in the SANAS Schedule of accreditation for this laboratory.</p> <p>2. Results marked "Subcontracted Test" in this report, are not included in the SANAS Schedule of accreditation for this laboratory.</p> <p>3. The estimated uncertainty of measurements for the accredited test results is obtainable from the laboratory - QP24 Appendix A.</p> <p>4. The results relate to the sample tested and the most recent methods available with a 95% confidence level.</p>					

**End of Report**