

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	BNK Reference No.:	iLembe/MAP10 SANS 15-04-2014
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ATTENTION:	<i>Mr. N.H. Maphumulo</i>	Clients Order. No	Full SANS
eMail:	Group 4 Details	DATE RECEIVED	15-04-2014
Analysis Date	22-04-2014	REPORT DATE:	24-04-2014

ANALYTICAL RESULTS

1	2	3	4		
Determinand	Test Method No	SANS 241-1:2011 Physical, aesthetic, operational, chemical and Microbiological determinands			MAP 10 Ntunjambili Tap
		Risk	Unit	Standard limits ^a	

Physical and aesthetic determinands



Free chlorine	P09/025	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 5</i>	0.18
Monochloramine	P09/025	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 3</i>	0.09
Colour	P09/011	<i>Aesthetic</i>	<i>mg/L Pt-Co</i>	<i>≤ 15</i>	0
Conductivity at 25°C	P09/044	<i>Aesthetic</i>	<i>mS/m</i>	<i>≤ 170</i>	16
Total Dissolved Solids {A}	P09/031	<i>Aesthetic</i>	<i>mg/L</i>	<i>≤ 1200</i>	102
Turbidity ^b {A}	P09/045	<i>Operational</i>	<i>NTU</i>	<i>≤ 1</i>	0.20
		<i>Aesthetic</i>	<i>NTU</i>	<i>≤ 5</i>	0.20
pH at 25°C ^c	P09/042	<i>Operational</i>	<i>pH units</i>	<i>≥ 5 to ≤ 9.7</i>	7.3

Chemical determinands - macro-determinands

Nitrate as NO ³	P09/018	<i>Acute health - 1</i>	<i>mg/L</i>	<i>ns</i>	17.0
Nitrate as N ^d	P09/018	<i>Acute health - 1</i>	<i>mg/L</i>	<i>≤ 11</i>	3.8
Nitrite as N ^d	P09/019	<i>Acute health - 1</i>	<i>mg/L</i>	<i>≤ 0.9</i>	0.04
Sulphate as SO ₄ ²⁻ {A}	P09/035	<i>Acute health - 1</i>	<i>mg/L</i>	<i>≤ 500</i>	4.7
		<i>Aesthetic</i>	<i>mg/L</i>	<i>≤ 250</i>	4.7
Fluoride as F ⁻	P09/010	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 1.5</i>	0.26
Ammonia as NH ³	P09/002	<i>Aesthetic</i>	<i>mg/L</i>	<i>≤ 1.5</i>	0.40
Chloride as Cl ⁻ {A}	P09/007	<i>Aesthetic</i>	<i>mg/L</i>	<i>≤ 300</i>	18
Sodium as Na	P09/047	<i>Aesthetic</i>	<i>mg/L</i>	<i>≤ 200</i>	13
Zinc as Zn	P09/047	<i>Aesthetic</i>	<i>mg/L</i>	<i>≤ 5</i>	0.122

Chemical determinands - micro-determinands

Antimony as Sb	P09/047	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.02</i>	nd
Arsenic as As	P09/089	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.01</i>	nd
Cadmium as Cd	P09/047	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.003</i>	nd
Total Chromium as Cr	P09/047	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.05</i>	nd
Cobalt as Co	P09/047	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.5</i>	nd
Copper as Cu	P09/047	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 2</i>	0.004
Cyanide as CN ⁻	P09/069	<i>Acute health - 1</i>	<i>mg/L</i>	<i>≤ 0.07</i>	nd
Iron as Fe	P09/014	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 2</i>	nd
		<i>Aesthetic</i>	<i>mg/L</i>	<i>≤ 0.3</i>	nd
Lead as Pb	P09/047	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.01</i>	nd
Manganese as Mn	P09/015	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.5</i>	nd
		<i>Aesthetic</i>	<i>mg/L</i>	<i>≤ 0.1</i>	nd
Mercury as Hg	P09/092	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.006</i>	nd
Nickel as Ni	P09/047	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.07</i>	nd
Selenium as Se	P09/090	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.01</i>	nd
Vanadium as V	P09/047	<i>Chronic health</i>	<i>mg/L</i>	<i>≤ 0.2</i>	0.001
Aluminium as Al	P09/053	<i>Operational</i>	<i>mg/L</i>	<i>≤ 0.3</i>	nd

Chemical determinands - organic determinands					
Total Organic Carbon as C	P09/093	<i>Chronic health</i>	<i>mg/L</i>	≤ 10	4.4
Trihalomethanes :					
<i>Chloroform</i>	<i>sub contracted</i>	<i>Chronic health</i>	<i>mg/L</i>	≤ 0.3	0.4710
<i>Bromoform</i>	<i>sub contracted</i>	<i>Chronic health</i>	<i>mg/L</i>	≤ 0.1	0.0046
<i>Dibromochloromethane</i>	<i>sub contracted</i>	<i>Chronic health</i>	<i>mg/L</i>	≤ 0.1	0.0010
<i>Bromodichloromethane</i>	<i>sub contracted</i>	<i>Chronic health</i>	<i>mg/L</i>	≤ 0.06	0.0020
Phenols	P09/071	<i>Aesthetic</i>	<i>mg/L</i>	≤ 0.01	<0.01
<p>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.</p> <p>b = Values in excess of those given in column 4 may negatively impact disinfection.</p> <p>c = Low pH values can result in structural problems in the distribution system.</p> <p>d = This is equivalent to nitrate at 50mg NO₃⁻ /L and nitrite as 3mg NO₂⁻ /L</p> <p>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.</p>					
MICROBIOLOGICAL RESULTS					
E.coli ^a {A}	P09/046	<i>Acute health - 1</i>	<i>Count per 100ml</i>	<i>Not detected</i>	0
Faecal coliforms ^b {A}		<i>Acute health - 1</i>	<i>Count per 100ml</i>	<i>Not detected</i>	0
Total coliforms ^c	P09/102	<i>Operational</i>	<i>Count per 100ml</i>	< 10	0
Heterotrophic plate count ^f	P09/103	<i>Operational</i>	<i>Count per ml</i>	< 1000	0
Somatic coliphages ^g	P09/104	<i>Operational</i>	<i>Count per 10ml</i>	<i>Not detected</i>	0
KEY: ns = not specified / nd = not detected					
<p>a = Definitive, preferred indicator of faecal pollution.</p> <p>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>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.</p> <p>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.</p> <p>e = Indicates potential faecal pollution and provides information on treatment efficiency and aftergrowth.</p> <p>f = Process indicator that provides information on treatment efficiency, aftergrowth in distribution networks and adequacy of disinfectant residuals.</p> <p>g = Process indicator that provides information on treatment efficiency.</p>					
<i>for and on behalf of B N KIRK (Natal) cc</i>					
				12-May-14	
Dawn Bester <i>Laboratory Manager / Managing Director (CertNatSci 200223/13)</i>		D. Subban - Chemistry Supervisor		Date	
Disclaimer:					
<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>					
Accreditation Disclaimer:					
<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