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UMHLABA
ENVIRONMENTAL CONSULTING CC

31st October 2018
Ref No.: INT_001-18/3

ATT: Renalda Hittler
Intertek Testing Services
60 Malcolm Moodie Crescent
Jet Park, 1451

RE: EVALUATION OF TREATED TAP WATER SAMPLE – OCTOBER 2018.

Dear Ms. Hittler

Umhlaba Environmental Consulting CC was commissioned to evaluate water quality result of one tap water sample, analysed by Intertek Testing Laboratory (Jet Park). The tap was treated by means of 30 000 dilutions with ProSol in the Laboratory before analysis[1].

This letter will provide details of the evaluation of the treated tap water results, comparing the results to the SAN 241:2015 Drinking Water Standards and is set out as follows:

Please feel free to discuss any aspects of this feedback with the author of the report, (details provided at the end of the letter).

Kind regards

Lynn Jones
M.Sc & Pr.Sci.Nat.

[1] Information provided in an e-mail from Renalda Hitler, 16th October 2018

1 BACKGROUND INFORMATION

Purpose of sampling: To determine if the "tap water" is suitable for drinking purposes in terms of the SANS 241-1:2015 Drinking Water Standard[2] after it is treated with ProSol.

Collection date: One sample was collected on the 11th October 2018. (It is assumed that sample was collected on the same date as the "date received" indicated on the laboratory certificates.)

Sampling location: The sample was collected from a potable source (referred to as "tap water" in this report) – no information has been provided as to the source of the water or the exact location of sample collection.

Determinants tested: Potable water analysis was undertaken by Intertek Testing Laboratory (Pty) Ltd (Jet Park). This was not a full potable water analysis as the clients requested that the majority of the bacteriological determinants be excluded[3] (only *E. coli* was included in the analysis).

2 SCOPE OF WORK

1. The results of the treated tap water sample to be compared with the Evaluation Criteria listed below.

   A. SANS 241-1: 2015 for Drinking Water, Part 1: Microbiological, physical, aesthetic and chemical determinands (SANS 241-1).
   Results are compared with the "*numerical limit*" published in the following Tables and are assuming a "*lifetime consumption*:
   - "*Table 1 – Microbiological determinands*" and
   - "*Table 2 – Physical, aesthetic, operational and chemical determinands*" of

DELIVERABLES:

A letter presenting the results and a comparison of the results against the Standards referred to above.

3 ASSESSMENT OF RESULTS

Included below is a comparison of the results against **A**) SANS 241-1:2015 for Drinking Water standards, hereafter referred to as "standards" (values provided in Table 3.1, page 3 below). Laboratory certificates are provided in Section 6.

A. All the determinants analysed recorded concentrations below the standards. Thus ***the treated tap water quality is suitable for human consumption based on the determinants analysed***.

CONCLUSION:

Based on the results, the treated tap water can be used for drinking purposes.

RECOMMENDATION:

As the water before the treatment was not analysed, it is not possible to determine if the treatment had any impact on the water quality. Therefore, it is recommended that the sample before treatment should be analysed in order to compared the before and after treatment water quality if the test will be continuing.

[2] Information provided in an e-mail from Renalda Hitler and Robert Brown, 29th October 2018

[3] Information provided in an email from Renalda Hitler, 16th October 2018

LABORATORY RESULTS:

Table 3.1: Laboratory Results as provided by Intertek Testing Laboratory (Pty) Ltd – Jet Park[4]

Determinants		*Evaluation Criteria*	*Water Quality*
Site Name	Units	SANS 241:2015 **Drinking Water**	*Tap Water Sample*
Site Description			**30 000 Dilution**
Sampled Date	-		*11-Oct-18*
Sampled Time	-		*Unknown*
pH	pH	5.0 to 9.7	8.3
Electrical Conductivity (EC)	mS/m	170	16.5
Total Dissolved Solids (TDS)	mg/ℓ	1200	109
Turbidity (NTU)	NTU	5	2.11
Free Chlorine	mg/ℓ	5	BDL
Chloride (Cl)	mg/ℓ	300	131
Fluoride as F	mg/ℓ	1.5	0.28
Sulphate (SO_4)	mg/ℓ	500	22.8
Ammonia as N	mg/ℓ	1.5	BDL
Nitrate as NO_3	mg/ℓ	11	4.59
Nitrite as NO_2	mg/ℓ	0.9	BDL
Dissolved Oxygen (DO)	mg/ℓ	-	1.8
Total Organic Carbon (TOC)	mg/ℓ	-	BDL
Phenol	mg/ℓ	10	0.2
Colour	mg/ℓ	15	BDL
Cyanide	mg/ℓ	-	0.004
E. coli	cfu/100ml	Not Detected	BDL
Aluminium (Al)	mg/ℓ	0.3	BDL
Calcium (Ca)	mg/ℓ	-	21
Iron (Fe)	mg/ℓ	2.0	BDL
Potassium (K)	mg/ℓ	-	3.32
Magnesium (Mg)	mg/ℓ	-	7.10
Manganese (Mn)	mg/ℓ	0.4	BDL
Sodium (Na)	mg/ℓ	200	9.04
Arsenic (As)	mg/ℓ	0.01	BDL
Boron (B)	mg/ℓ	2.4	BDL
Barium (Ba)	mg/ℓ	0.7	0.04
Cadmium (Cd)	mg/ℓ	0.003	BDL
Chromium (Cr)	mg/ℓ	0.05	BDL
Copper (Cu)	mg/ℓ	2.0	0.66
Nickel (Ni)	mg/ℓ	0.07	BDL
Lead (Pb)	mg/ℓ	0.01	BDL
Antimony (Sb)	mg/ℓ	0.02	BDL
Selenium (Se)	mg/ℓ	0.04	BDL
Uranium (U)	mg/ℓ	0.03	BDL
Vanadium (V)	mg/ℓ	-	0.002
Zinc (Zn)	mg/ℓ	5.0	0.212
Mercury (Hg)	mg/ℓ	0.006	BDL
Bromoform	µg/ℓ	100	BDL
Chloroform	µg/ℓ	300	42

[4] Results e-mailed by Renalda Hitler, 29th October 2018

Determinants		Evaluation Criteria	Water Quality
Site Name	Units	SANS 241:2015 **Drinking Water**	*Tap Water Sample*
Site Description			**30 000 Dilution**
Sampled Date	-		*11-Oct-18*
Sampled Time	-		*Unknown*
Bromodichloromethane	µg/ℓ	60	15
Dibromochloromethane	µg/ℓ	100	BDL
Trichloroethene	µg/ℓ	-	BDL

NOTES: BDL = Below Detectable Limit ND = Not Detected

4 ASSUMPTIONS AND EXCLUSIONS

1. Sample collection was not undertaken by Umhlaba personnel.
2. Sample was collected on the same date as the “Receiving date” indicated on the laboratory certificate.
3. Analysis was undertaken by Intertek Testing Laboratory (Jet Park) with no input from Umhlaba Environmental Consulting CC
4. Umhlaba Environmental Consulting CC had no involvement on the treatment process.
5. The water quality before treatment was not provided.

6 APPENDICES

LABORATORY CERTIFICATES

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CERTIFICATE OF ANALYSIS - AMENDED

Client	Consume-It
Client Address	Unknown
Sample	Water
Sample Origin	Tap Water

Sampling Method	Sampled by client	Sample Number	ENV 18-4035
Sampling Date & Time	Unknown	Client Reference	30 000 Dilution with Prosol
Received Date & Time	11 October 2018 @ 10H00	Certificate Number	ENV 18-4035-1
Date Tests Completed	25 October 2018	Report Date	29 October 2018

DETERMINANT	METHOD	MDL	RESULT
pH	INTERTEK/ENV/IHM/002	-	8.3
Electrical conductivity, mS/m	INTERTEK/ENV/IHM/003	-	16.5
Total Dissolved Solids, mg/ l	*PL-700AL	5	109
Turbidity, NTU	*TURBIDITY METER	-	2.11
Free Chlorine, mg/l	*CHLORINE METER	0.2	<0.2
Chloride (Cl), mg/ l	INTERTEK/ENV/IHM/006	0.08	131
Fluoride (F), mg/ l	INTERTEK/ENV/IHM/006	0.02	0.28
Sulphate (SO_4), mg/ l	*INTERTEK/ENV/IHM/006	-	22.8
Ammonia as N, mg/l	INTERTEK/ENV/IHM/006	0.01	<0.01
Nitrate as NO3, mg/ l	INTERTEK/ENV/IHM/006	0.10	4.59
Nitrite as NO2, mg/ l	*INTERTEK/ENV/IHM/006	0.02	<0.02
Dissolved Oxygen (DO), mg/l	*DO METER	-	1.80
Total Organic Carbon (TOC), mg/l	#OUTSOURCED	10	<10
Phenol, mg/l	#OUTSOURCED	-	0.02
Colour, mg/l	#OUTSOURCED	10	<10
Cyanide, mg/l	#OUTSOURCED	-	0.004
Aluminium (Al), mg/ l	#OUTSOURCED	0.002	<0.002
Calcium (Ca), mg/ l	#OUTSOURCED	0.05	21.0
Iron (Fe), mg/ l	#OUTSOURCED	0.003	<0.004
Potassium (K), mg/ l	#OUTSOURCED	0.05	3.32
Magnesium (Mg), mg/ l	#OUTSOURCED	0.05	7.10
Manganese (Mn), mg/ l	#OUTSOURCED	0.001	<0.001
Sodium (Na), mg/ l	#OUTSOURCED	0.05	9.04
E.Coli, cfu/100ml	INTERTEK/MICRO/IHM	10	<10

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CERTIFICATE OF ANALYSIS - AMENDED

Client	Consume-It
Client Address	Unknown
Sample	Water
Sample Origin	Tap Water

Sampling Method	Sampled by client	Sample Number	ENV 18-4035
Sampling Date & Time	Unknown	Client Reference	30 000 Dilution with Prosol
Received Date & Time	11 October 2018 @ 10H00	Certificate Number	ENV 18-4035-1
Date Tests Completed	25 October 2018	Report Date	29 October 2018

DETERMINANT	METHOD	MDL	RESULT
Arsenic (As), mg/l	#OUTSOURCED	0.006	<0.006
Boron (B), mg/l	#OUTSOURCED	0.013	<0.013
Barium (Ba), mg/l	#OUTSOURCED	0.005	0.04
Cadmium (Cd), mg/l	#OUTSOURCED	0.002	<0.002
Chromium (Cr), mg/l	#OUTSOURCED	0.003	<0.003
Copper (Cu), mg/l	#OUTSOURCED	0.002	0.66
Nickel (Ni), mg/l	#OUTSOURCED	0.002	<0.002
Lead (Pb), mg/l	#OUTSOURCED	0.004	<0.004
Antimony (Sb), mg/l	#OUTSOURCED	0.001	<0.001
Selenium (Se), mg/l	#OUTSOURCED	0.002	<0.002
Uranium (U), mg/l	#OUTSOURCED	0.015	<0.015
Vanadium (V), mg/l	#OUTSOURCED	0.001	0.002
Zinc (Zn), mg/l	#OUTSOURCED	0.005	0.212
Mercury (Hg), mg/l	#OUTSOURCED	0.004	<0.004
Bromoform, µg/l	#OUTSOURCED	5	<5
Chloroform, µg/l	#OUTSOURCED	5	42
Bromodichloromethane, µg/l	#OUTSOURCED	10	15
Dibromochloromethane, µg/l	#OUTSOURCED	2	<2
Trichloroethene, µg/l	#OUTSOURCED	5	<5

Amended to include E.Coli results left out on the initial report.

Key: * NOT ACCREDITED # SUBCONTRACTED TEST X OUT OF SPECIFICATION TEST

NOTES:
Intertek does not accept responsibility for errors that may have risen during collection of the samples nor during the transport of the samples by the client or any third party. Opinions and interpretations expressed herein are outside the scope of SANAS accreditation. Results marked "Not SANAS Accredited" in this report are not included in the SANAS Schedule of Accreditation for this laboratory. Results marked as "Subcontracted Test" in this report are not included in the SANAS schedule of accreditation for this laboratory. Measurement of uncertainty values are available upon request.

Renalda Hittler
Technical Signatory

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REPORTING BY:

Compiled By:	Tryphosa Mokalapa (Umhlaba Environmental Consulting CC)	
Reviewed By:		Lynn Jones (Umhlaba Environmental Consulting CC)
Applicable Qualification:	• NDip Analytical Chemistry (2005-2007). TUT. Pretoria. RSA. • BTech Chemistry (2008 & 2014). TUT. Pretoria. RSA. • BSc Hon Environmental Management (2012-2014). UNISA. Pretoria. RSA.	• BSc Hon Geology (1996). Rhodes University. Grahamstown. RSA. • MSc Zoology (1997-1999). Rhodes University. Grahamstown. RSA. • Short Course on the Role and Use of Aquatic Bio-monitoring. (*February 2001 - Rhodes University*) • Air Quality Management and Pollution Control in South Africa. (*April 2002 - Matrix and University of the Witwatersrand CEE*) • Environmental Monitoring and Reporting (*July 2005 – University of Witwatersrand*) • Short Course in Wetland Training - Background to wetlands. delineation and impact assessments. *(September 2005 – University of Pretoria)* • Short Course in Air Quality Management: Dustfall Monitoring and Reporting *(October 2017 – Gondwana Environmental Solutions)*
Relevant Experience:	Tryphosa Mokalapa has been working on the field of water quality monitoring and environmental management since 2007. During this time she has been involved in sample collection (potable, surface, sewerage and ground water), preparation of samples for analysis, laboratory analysis, and interpretation of results and report writing.	Lynn Jones has been working on the field of environmental management since 2000. During this time, she has undertaken monitoring reporting for over 25 operations (predominantly on aggregate and gold mines). Since 2009. Lynn has been responsible for establishing and managing monitoring networks for the mining industry.