



**RAND WATER**  
**Madibeng Water Quality Report**  
**1 Month**

21 November 2020 to 22 December 2020

Date generated: 08 January 2021

|  |                                |                |                                   |               |   |   | Descriptive Statistics |                    |                         |
|--|--------------------------------|----------------|-----------------------------------|---------------|---|---|------------------------|--------------------|-------------------------|
| Determinands                                   | Measurement Units              | Risks          | SANS 241:2015 standard limits (1) | No of results | Required compliances to SANS 241:2015 spec(%) | Achieved compliances to SANS 241:2015 spec(%) | Mean                   | Standard Deviation | Mean + 3 Std deviations |
| <b>Microbiological determinands</b>            |                                |                |                                   |               |   |   |                        |                    |                         |
| <i>E. coli</i>                                 | (mpn per 100 mL)               | Acute health   | Non-detect                        | 24            | 99.0%   | 100%  | 0                      | 0.00               | 0                       |
| Total Coliforms                                | (mpn per 100 mL)               | Operational    | ≤ 10                              | 24            | 95.0%   | 95.83%  | 1                      | 3.06               | 10                      |
| Heterotrophic Plate Count                      | (cfu per 1 mL)                 | Operational    | ≤ 1000                            | 30            | 95.0%   | 100%  | 0                      | 0.72               | 3                       |
| <i>Cryptosporidium spp</i> (2)                 | (org / 10 Litre)               | Acute health   | Non-detect                        | 17            | 99.0%   | 100%  | 0                      | 0.00               | 0                       |
| <i>Giardia spp</i> (2)                         | (org / 10 Litre)               | Acute health   | Non-detect                        | 17            | 99.0%   | 100%  | 0                      | 0.00               | 0                       |
| Somatic Coliphages (2)                         | (count per 10 mL)              | Operational    | Non-detect                        | 80            | 95.0%   | 100%  | 0                      | 0.00               | 0                       |
| <b>Physical and Aesthetic determinands</b>     |                                |                |                                   |               |   |   |                        |                    |                         |
| Colour   | (mg / L as Pt-Co)              | Aesthetic      | ≤ 15                              | 2             | 95.0%   | 100%  | 7.00                   | 1.41               | 11.24                   |
| Conductivity                                   | (mS / m)                       | Aesthetic      | ≤ 170                             | 30            | 95.0%   | 100%  | 21.63                  | 2.82               | 30.10                   |
| Total Dissolved Solids                         | (mg / L)                       | Aesthetic      | ≤ 1200                            | 2             | 95.0%   | 100%  | 142.50                 | 10.61              | 174.32                  |
| Turbidity                                      | (NTU)                          | Operational    | ≤ 1                               | 30            | 95.0%   | 100%  | 0.26                   | 0.02               | 0.32                    |
| Turbidity                                      | (NTU)                          | Aesthetic      | ≤ 5                               | 30            | 95.0%   | 100%  | 0.26                   | 0.02               | 0.32                    |
| pH   | (pH units)                     | Operational    | ≥ 5 to ≤ 9.7                      | 30            | 95.0%   | 100%  | 7.99                   | 0.16               | 8.46                    |
| <b>Chemical Properties: Macro determinands</b> |                                |                |                                   |               |   |   |                        |                    |                         |
| Ammonia  | (mg / L as N)                  | Aesthetic      | ≤ 1.5                             | 30            | 95.0%   | 100%  | 0.29                   | 0.14               | 0.72                    |
| Chloride                                       | (mg / L as Cl)                 | Aesthetic      | ≤ 300                             | 3             | 95.0%   | 100%  | 12.00                  | 0.00               | 12.00                   |
| Free chlorine                                  | (mg / L as Cl <sub>2</sub> )   | Chronic health | ≤ 5                               | 30            | 97.0%   | 100%  | 0.08                   | 0.03               | 0.16                    |
| Monochloramine                                 | (mg / L as Cl <sub>2</sub> )   | Chronic health | ≤ 4.1                             | 30            | 97.0%   | 100%  | 1.16                   | 0.27               | 1.96                    |
| Fluoride                                       | (mg / L as F)                  | Chronic health | ≤ 1.5                             | 3             | 97.0%   | 100%  | 0.34                   | 0.02               | 0.39                    |
| Nitrate  | (mg / L as N)                  | Acute health   | ≤ 11                              | 30            | 99.0%   | 100%  | 0.51                   | 0.03               | 0.60                    |
| Nitrite  | (mg / L as N)                  | Acute health   | ≤ 0.9                             | 32            | 99.0%   | 100%  | 0.10                   | 0.16               | 0.58                    |
| Combined nitrate plus nitrite (3)              | (mg / L as N)                  | Acute health   | ≤ 1                               | 30            | 99.0%   | 100%  | 0.16                   | 0.19               | 0.72                    |
| Residual disinfectant (4)                      | (mg / L as Cl <sub>2</sub> )   | Operational    | ≥ 0.1                             | 30            | 95.0%   | 100%  | 1.24                   | 0.27               | 2.04                    |
| Sodium   | (mg / L as Na)                 | Aesthetic      | ≤ 200                             | 2             | 95.0%   | 100%  | 8.20                   | 0.14               | 8.62                    |
| Sulphate                                       | (mg / L as SO <sub>4</sub> )   | Aesthetic      | ≤ 250                             | 3             | 95.0%   | 100%  | 16.00                  | 0.00               | 16.00                   |
| Sulphate                                       | (mg / L as SO <sub>4</sub> )   | Acute health   | ≤ 500                             | 3             | 99.0%   | 100%  | 16.00                  | 0.00               | 16.00                   |
| Zinc   | (mg / L as Zn)                 | Aesthetic      | ≤ 5                               | 2             | 95.0%   | 100%  | 0.00                   | 0.00               | 0.00                    |
| <b>Chemical Properties: Micro determinands</b> |                                |                |                                   |               |   |   |                        |                    |                         |
| Aluminium                                      | (µg / L as Al)                 | Operational    | ≤ 300                             | 2             | 95.0%   | 100%  | 21.00                  | 4.24               | 33.73                   |
| Antimony                                       | (µg / L as Sb)                 | Chronic health | ≤ 20                              | 2             | 97.0%   | 100%  | 0.60                   | 0.00               | 0.60                    |
| Arsenic  | (µg / L as As)                 | Chronic health | ≤ 10                              | 2             | 97.0%   | 100%  | 0.80                   | 0.00               | 0.80                    |
| Barium   | (µg / L as Ba)                 | Chronic health | ≤ 700                             | 2             | 97.0%   | 100%  | 32.50                  | 3.54               | 43.11                   |
| Boron  | (µg / L as B)                  | Chronic health | ≤ 2400                            | 2             | 97.0%   | 100%  | 7.25                   | 8.13               | 31.65                   |
| Cadmium  | (µg / L as Cd)                 | Chronic health | ≤ 3                               | 2             | 97.0%   | 100%  | 1.00                   | 0.00               | 1.00                    |
| Chromium (Total)                               | (µg / L as Cr)                 | Chronic health | ≤ 50                              | 2             | 97.0%   | 100%  | 0.50                   | 0.00               | 0.50                    |
| Copper   | (µg / L as Cu)                 | Chronic health | ≤ 2000                            | 2             | 97.0%   | 100%  | 2.90                   | 1.27               | 6.72                    |
| Cyanide (Recoverable)                          | (µg / L as CN)                 | Acute health   | ≤ 200                             | 2             | 99.0%   | 100%  | 5.00                   | 0.00               | 5.00                    |
| Iron   | (µg / L as Fe)                 | Chronic health | ≤ 2000                            | 2             | 97.0%   | 100%  | 100.00                 | 0.00               | 100.00                  |
| Iron   | (µg / L as Fe)                 | Aesthetic      | ≤ 300                             | 2             | 95.0%   | 100%  | 100.00                 | 0.00               | 100.00                  |
| Lead   | (µg / L as Pb)                 | Chronic health | ≤ 10                              | 2             | 97.0%   | 100%  | 2.00                   | 0.00               | 2.00                    |
| Manganese                                      | (µg / L as Mn)                 | Chronic health | ≤ 400                             | 2             | 97.0%   | 100%  | 2.00                   | 0.00               | 2.00                    |
| Manganese                                      | (µg / L as Mn)                 | Aesthetic      | ≤ 100                             | 2             | 95.0%   | 100%  | 2.00                   | 0.00               | 2.00                    |
| Mercury  | (µg / L as Hg)                 | Chronic health | ≤ 6                               | 2             | 97.0%   | 100%  | 0.80                   | 0.00               | 0.80                    |
| Nickel   | (µg / L as Ni)                 | Chronic health | ≤ 70                              | 2             | 97.0%   | 100%  | 3.00                   | 0.00               | 3.00                    |
| Selenium                                       | (µg / L as Se)                 | Chronic health | ≤ 40                              | 2             | 97.0%   | 100%  | 4.00                   | 0.00               | 4.00                    |
| Uranium  | (µg / L as U)                  | Chronic health | ≤ 30                              | 2             | 97.0%   | 100%  | 0.50                   | 0.00               | 0.50                    |
| <b>Organic determinands</b>                    |                                |                |                                   |               |   |   |                        |                    |                         |
| Total Organic Carbon                           | (mg / L)                       | Chronic health | ≤ 10                              | 2             | 97.0%   | 100%  | 2.80                   | 0.14               | 3.22                    |
| Phenols as C <sub>6</sub> H <sub>5</sub> OH    | (µg / L)                       | Aesthetic      | ≤ 10                              | 2             | 95.0%   | 100%  | 3.00                   | 0.00               | 3.00                    |
| Chloroform - CHCl <sub>3</sub>                 | (µg / L)                       | Chronic health | ≤ 300                             | 2             | 97.0%   | 100%  | 39.50                  | 4.95               | 54.35                   |
| Bromoform - CHBr <sub>3</sub>                  | (µg / L)                       | Chronic health | ≤ 100                             | 2             | 97.0%   | 100%  | 10.00                  | 0.00               | 10.00                   |
| Dibromochloromethane - CHBr <sub>2</sub> Cl    | (µg / L)                       | Chronic health | ≤ 100                             | 2             | 97.0%   | 100%  | 10.00                  | 0.00               | 10.00                   |
| Bromodichloromethane - CHBrCl <sub>2</sub>     | (µg / L)                       | Chronic health | ≤ 60                              | 2             | 97.0%   | 100%  | 14.50                  | 0.71               | 16.62                   |
| Combined trihalomethanes (5)                   | (µg / L)                       | Chronic health | ≤ 1                               | 2             | 97.0%   | 100%  | 0.40                   | 0.03               | 0.48                    |
| Total Microcystin (2)                          | (µg / L)                       | Chronic health | ≤ 1                               | no data       | 97.0%   | no data                                       | .                      | no data            | .                       |
| <b>For monitoring/reporting purposes only</b>  |                                |                |                                   |               |   |   |                        |                    |                         |
| Calcium (6)                                    | (mg / L as Ca)                 | Aesthetic      | ≤ 150                             | 2             | not applicable                                | 100%  | 15.00                  | 0.00               | 15.00                   |
| Hardness (7)                                   | (mg / L as CaCO <sub>3</sub> ) | Operational    | ≥ 20 to ≤ 200                     | 2             | not applicable                                | 100%  | 60.00                  | 0.00               | 60.00                   |
| Magnesium (6)                                  | (mg / L as Mg)                 | Aesthetic      | ≤ 70                              | 2             | not applicable                                | 100%  | 5.45                   | 0.07               | 5.66                    |
| Potassium (6)                                  | (mg / L as K)                  | Aesthetic      | ≤ 50                              | 2             | not applicable                                | 100%  | 2.50                   | 0.00               | 2.50                    |
| <b>Rand Water Risk Determinands (RWRD) (6)</b> |                                |                |                                   |               |   |   |                        |                    |                         |
| Odour  | TON                            | RWRD           | ≤ 2                               | 18            | not applicable                                | 100%  | 1.00                   | 0.00               | 1.00                    |
| Taste  | FTN                            | RWRD           | ≤ 2                               | 18            | not applicable                                | 100%  | 1.00                   | 0.00               | 1.00                    |

| Risks                        | Required compliances to SANS 241: 2015 standard | Overall Compliances - SANS 241: 2015 standard |
|------------------------------|---|---|
| Acute health microbiological | 99.0%   | 100%  |
| Acute health chemical        | 99.0%   | 100%  |
| Chronic health               | 97.0%   | 100%  |
| Aesthetic                    | 95.0%   | 100%  |
| Operational                  | 95.0%   | 99.56%  |

- Notes  
(1) Specification SANS 241 date of effect : 1 July 2016  
(2) Measured at water treatment works exit points  
(3) (NO<sub>2</sub>/0.9 + NO<sub>3</sub>/11)  
(4) Residual disinfectant : Results from the chloraminated system = Sum of Free and Monochloramine  
(5) (CHCl<sub>3</sub>/300 + CHBr<sub>3</sub>/100 + CHBr<sub>2</sub>Cl/100 + CHBrCl<sub>2</sub>/60)  
(6) Customer request: Results not included in the risk indices compliance calculations and limits based on SANS 241:2006  
(7) Customer request: Results not included in the risk indices compliance calculations and limits based on RW Internal Spec  
\*\*\*\* Determinands with no data are due to instrument breakdown\*\*\*\*