

**Barrage Consumer Supply Water Quality Report (SANS 241) - 12 Month**

23 October 2017 to 22 October 2018

Date generated: 05 November 2018

| Determinand                                 | Measurement units            | Risk           | Required compliance to SANS 0241 2015 standard (%) | SANS 0241:2015 standard limits (1) | No of results  | Achieved Compliance to SANS0241: 2015 Spec(%) | Descriptive statistics |                |                              |
|---|------------------------------|----------------|--|------------------------------------|----------------|---|------------------------|----------------|------------------------------|
|   |                              |                |  |                                    |                |   | Mean                   | Std Deviation  | Mean + 3 standard deviations |
| <b>Microbiological determinands</b>         |                              |                |  |                                    |                |   |                        |                |                              |
| <i>E. coli</i>                              | (mpn per 100 mL)             | Acute health   | 99.0%  | 0                                  | 159            | 100.0%  | 0                      | 0.00           | 0                            |
| Total Coliforms                             | (mpn per 100 mL)             | Operational    | 95.0%  | 10                                 | 159            | 100.0%  | 0                      | 0.00           | 0                            |
| Heterotrophic Plate Count                   | (cfu per 1 mL)               | Operational    | 95.0%  | ≤1000                              | 159            | 100.0%  | 4                      | 9.89           | 33                           |
| <i>Cryptosporidium spp</i>                  | (org / 10 Litre)             | Acute health   | 99.0%  | 0                                  | 24             | 100.0%  | 0                      | 0.00           | 0                            |
| <i>Giardia spp</i>                          | (org / 10 Litre)             | Acute health   | 99.0%  | 0                                  | 24             | 100.0%  | 0                      | 0.00           | 0                            |
| Somatic Coliphages                          | (count per 10 mL)            | Operational    | 95.0%  | 0                                  | 53             | 100.0%  | 0                      | 0.00           | 0                            |
| <b>Physical and Aesthetic determinands</b>  |                              |                |  |                                    |                |   |                        |                |                              |
| Colour                                      | (mg / L as Pt-Co)            | Aesthetic      | 95.0%  | ≤15                                | 20             | 100.0%  | 5.10                   | 0.31           | 6.00                         |
| Conductivity                                | (mS / m)                     | Aesthetic      | 95.0%  | ≤170                               | 159            | 100.0%  | 74.76                  | 14.78          | 99.42                        |
| Total Dissolved Solids                      | (mg / L)                     | Aesthetic      | 95.0%  | ≤1200                              | 20             | 100.0%  | 448.75                 | 98.97          | 745.65                       |
| Turbidity                                   | (NTU)                        | Operational    | 95.0%  | ≤1                                 | 159            | 99.4%   | 0.33                   | 0.18           | 0.87                         |
| Turbidity                                   | (NTU)                        | Aesthetic      | 95.0%  | ≤5                                 | 159            | 100.0%  | 0.33                   | 0.18           | 0.87                         |
| pH  | (pH units)                   | Operational    | 95.0%  | ≥ 5 to ≤ 9.7                       | 159            | 100.0%  | 8.07                   | 0.11           | 8.40                         |
| <b>Chemical Properties</b>                  |                              |                |  |                                    |                |   |                        |                |                              |
| <b>Macro determinands</b>                   |                              |                |  |                                    |                |   |                        |                |                              |
| Ammonia                                     | (mg / L as N)                | Aesthetic      | 95.0%  | ≤1.5                               | 159            | 100.0%  | 0.06                   | 0.14           | 0.47                         |
| Chloride                                    | (mg / L as Cl)               | Aesthetic      | 95.0%  | ≤300                               | 20             | 100.0%  | 58.50                  | 20.42          | 119.75                       |
| Free chlorine                               | (mg / L as Cl <sub>2</sub> ) | Chronic health | 97.0%  | ≤5                                 | 159            | 100.0%  | 1.60                   | 0.47           | 2.20                         |
| Monochloramine                              | (mg / L as Cl <sub>2</sub> ) | Chronic health | 97.0%  | ≤4.1                               | not applicable | not applicable                                | not applicable         | not applicable | not applicable               |
| Fluoride                                    | (mg / L as F)                | Chronic health | 97.0%  | ≤1.5                               | 20             | 100.0%  | 0.20                   | 0.02           | 0.25                         |
| Nitrate                                     | (mg / L as N)                | Acute health   | 99.0%  | ≤11                                | 159            | 100.0%  | 3.32                   | 1.23           | 7.00                         |
| Nitrite                                     | (mg / L as N)                | Acute health   | 99.0%  | ≤0.9                               | 159            | 100.0%  | 0.03                   | 0.00           | 0.03                         |
| Combined nitrate plus nitrite (2)           | (mg / L as N)                | Acute health   | 99.0%  | ≤1                                 | 159            | 100.0%  | 0.33                   | 0.11           | 0.67                         |
| Residual disinfectant                       | (mg / L)                     | Operational    | 95.0%  | ≥0.2 Chlorinated system            | 159            | 100.0%  | 1.60                   | 0.47           | 3.00                         |
| Sodium                                      | (mg / L as Na)               | Aesthetic      | 95.0%  | ≤200                               | 20             | 100.0%  | 55.79                  | 20.99          | 118.75                       |
| Sulphate                                    | (mg / L as SO <sub>4</sub> ) | Aesthetic      | 95.0%  | ≤250                               | 20             | 100.0%  | 146.70                 | 46.03          | 284.80                       |
| Sulphate                                    | (mg / L as SO <sub>4</sub> ) | Acute health   | 99.0%  | ≤500                               | 20             | 100.0%  | 146.70                 | 46.03          | 284.80                       |
| Zinc  | (mg / L as Zn)               | Aesthetic      | 95.0%  | ≤5                                 | 20             | 100.0%  | 0.08                   | 0.22           | 0.73                         |
| <b>Micro determinands</b>                   |                              |                |  |                                    |                |   |                        |                |                              |
| Aluminium                                   | (µg / L as Al)               | Operational    | 95.0%  | ≤300                               | 20             | 100.0%  | 34.25                  | 9.70           | 49.81                        |
| Antimony                                    | (µg / L as Sb)               | Chronic health | 97.0%  | ≤20                                | 19             | 100.0%  | 0.83                   | 1.46           | 5.21                         |
| Arsenic                                     | (µg / L as As)               | Chronic health | 97.0%  | ≤10                                | 17             | 100.0%  | 1.63                   | 2.25           | 6.37                         |
| Barium                                      | (µg / L as Ba)               | Chronic health | 97.0%  | ≤700                               | 20             | 100.0%  | 35.25                  | 8.42           | 45.81                        |
| Boron                                       | (µg / L as B)                | Chronic health | 97.0%  | ≤2400                              | 20             | 100.0%  | 73.05                  | 24.53          | 109.05                       |
| Cadmium                                     | (µg / L as Cd)               | Chronic health | 97.0%  | ≤3                                 | 17             | 100.0%  | 2.41                   | 0.36           | 3.50                         |
| Chromium (Total)                            | (µg / L as Cr)               | Chronic health | 97.0%  | ≤50                                | 20             | 100.0%  | 13.00                  | 4.10           | 25.31                        |
| Copper                                      | (µg / L as Cu)               | Chronic health | 97.0%  | ≤2000                              | 20             | 100.0%  | 9.60                   | 0.82           | 10.00                        |
| Cyanide (Recoverable)                       | (µg / L as CN)               | Acute health   | 99.0%  | ≤200                               | 20             | 100.0%  | 11.75                  | 7.66           | 34.72                        |
| Iron  | (µg / L as Fe)               | Chronic health | 97.0%  | ≤2000                              | 20             | 100.0%  | 20.94                  | 13.49          | 61.78                        |
| Iron  | (µg / L as Fe)               | Aesthetic      | 95.0%  | ≤300                               | 20             | 100.0%  | 20.94                  | 13.49          | 61.78                        |
| Lead  | (µg / L as Pb)               | Chronic health | 97.0%  | ≤10                                | 17             | 100.0%  | 0.95                   | 1.57           | 5.67                         |
| Manganese                                   | (µg / L as Mn)               | Chronic health | 97.0%  | ≤400                               | 20             | 100.0%  | 10.63                  | 2.77           | 18.92                        |
| Manganese                                   | (µg / L as Mn)               | Aesthetic      | 95.0%  | ≤100                               | 20             | 100.0%  | 10.63                  | 2.77           | 18.92                        |
| Mercury                                     | (µg / L as Hg)               | Chronic health | 97.0%  | ≤6                                 | 19             | 100.0%  | 0.72                   | 0.25           | 1.47                         |
| Nickel                                      | (µg / L as Ni)               | Chronic health | 97.0%  | ≤70                                | 20             | 100.0%  | 9.60                   | 1.01           | 12.62                        |
| Selenium                                    | (µg / L as Se)               | Chronic health | 97.0%  | ≤40                                | 17             | 100.0%  | 1.25                   | 1.09           | 4.51                         |
| Uranium                                     | (µg / L as U)                | Chronic health | 97.0%  | ≤30                                | 19             | 100.0%  | 0.97                   | 0.87           | 3.59                         |
| <b>Organic determinands</b>                 |                              |                |  |                                    |                |   |                        |                |                              |
| Total Organic Carbon                        | (mg / L)                     | Chronic health | 97.0%  | ≤10                                | 20             | 100.0%  | 4.20                   | 1.02           | 7.27                         |
| Phenols as C <sub>6</sub> H <sub>5</sub> OH | (µg / L)                     | Aesthetic      | 95.0%  | ≤10                                | 20             | 100.0%  | 4.60                   | 0.82           | 7.06                         |
| Chloroform - CHCl <sub>3</sub>              | (µg / L)                     | Chronic health | 97.0%  | ≤300                               | 20             | 100.0%  | 30.10                  | 11.96          | 53.05                        |
| Bromoform - CHBr <sub>3</sub>               | (µg / L)                     | Chronic health | 97.0%  | ≤100                               | 20             | 100.0%  | 2.46                   | 3.87           | 10.00                        |
| Dibromochloromethane - CHBr <sub>2</sub> Cl | (µg / L)                     | Chronic health | 97.0%  | ≤100                               | 20             | 100.0%  | 9.88                   | 2.73           | 14.81                        |
| Bromodichloromethane - CHBrCl <sub>2</sub>  | (µg / L)                     | Chronic health | 97.0%  | ≤60                                | 20             | 100.0%  | 18.21                  | 5.37           | 26.43                        |
| Combined trihalomethanes (3)                | (µg / L)                     | Chronic health | 97.0%  | ≤1                                 | 20             | 100.0%  | 0.53                   | 0.16           | 1.01                         |
| Total Mycrocystin                           | (µg / L)                     | Chronic health | 97.0%  | ≤0.7                               | 12             | 100.0%  | 0.31                   | 0.00           | 0.31                         |

| <b>Water quality risk indices</b> |  |                             |
|-----------------------------------|--|-----------------------------|
| Risk                              | Required compliance to SANS 241: 2015 standard | Overall Compliance-SANS 241 |
| Acute health microbiological      | 99.00%   | 100.00%                     |
| Acute health chemical             | 99.00%   | 100.00%                     |
| Chronic health                    | 97.00%   | 100.00%                     |
| Aesthetic                         | 95.00%   | 100.00%                     |
| Operational                       | 95.00%   | 99.88%                      |

**Notes:**  
(1) Specification date of effect : 1 July 2016  
(2) (NO<sub>2</sub>/0.9 + NO<sub>3</sub>/11)  
(3) (CHCl<sub>3</sub>/300 + CHBr<sub>3</sub>/100 + CHBr<sub>2</sub>Cl/100 + CHBrCl<sub>2</sub>/60)