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**White River WWTP (Site 1)**

The tables below show data analysed for Site 1 which is located upstream of the study area. The wastewater treatment plant treats domestic wastewater from White River town and nearby locations and discharges effluent into White River, which is a tributary of Crocodile River.

**Supplementary table 1:** Effluent discharge quality limits as per White River WWTP water use licence

| Constituents | Limits |
|---|---|
| Electrical conductivity (ms/m) | 70 |
| Nitrite and nitrates (mg/L) | 15 |
| Phosphate (mg/L) | 1 |
| Ammonia-N (mg/L) | 1 |
| Chemical oxygen demand (mg/L) | 75 |
| *E. coli* (count per mL) | 0 |
| Suspended solids (mg/L) | 25 |
| pH | 5.5–9.5 |

**Supplementary table 2:** Water quality data for the 2017 wet and dry seasons at Site 1

| Month | pH | COD (mg/L) | $NO_2$ + $NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 7.40 | 66 | 1.53 | 11.40 | 2.17 | 0 | 14.4 | 56.5 |
| February | 7.00 | 602 | 1.27 | 5.70 | 3.59 | 184 200 | 221 | 58.2 |
| March | 7.18 | 76 | 1.65 | 20.70 | 4.13 | 0 | 19.2 | 61.7 |
| October | 7.52 | 47 | 4.46 | 0.20 | 0.13 | 0 | 6.8 | 45.8 |
| November | 6.95 | 80 | 0.33 | 12.30 | 1.80 | 0 | 27.2 | 51.4 |
| December | 7.66 | 55 | 0.11 | 11.10 | 1.99 | 0 | 17.2 | 48.9 |
| **Mean** | **7.3** | **154.3** | **1.55** | **10.2** | **2.30** | **30 700** | **51.0** | **63.2** |
| **Dry season** | | | | | | | | |
| April | 7.30 | 88 | 0.96 | 21.70 | 4.47 | 282 800 | 71.2 | 63.4 |
| May | 8.11 | 47 | 0.39 | 15.20 | 5.85 | 484 000 | 6 | 64.3 |
| June | 7.24 | 38 | 4.03 | 7.53 | 1.54 | 0 | 8.4 | 62.8 |
| July | 7.35 | 59 | 0.11 | 12.20 | 5.22 | 0 | 20.80 | 64.0 |
| August | 7.28 | 48 | 0.75 | 16.30 | 0.66 | 484 000 | 19.6 | 68.0 |
| September | 7.07 | 46 | 4.14 | 5.32 | 3.43 | 25 | 11.20 | 90.5 |
| **Mean** | **7.4** | **54.3** | **1.73** | **13.04** | **3.53** | **208 470.8** | **22.9** | **68.8** |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **1** | **1** | **0** | **25** | **70** |

**Supplementary table 3:** Water quality data for the 2018 wet and dry seasons at Site 1

| Month | pH | COD (mg/L) | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 6.74 | 34 | 1.69 | 3.29 | 0.62 | 2 | 8.00 | 44.6 |
| February | 7.07 | 69.0 | 4.79 | 2.32 | 1.47 | 5800 | 51.6 | 39.8 |
| March | 6.99 | 49.0 | 0.22 | 1.61 | 0.36 | 0 | 21.2 | 45.0 |
| October | 7.12 | 127.0 | 3.25 | 10.7 | 1.13 | 0 | 53.2 | 52.8 |
| November | 7.33 | 116.0 | 0.18 | 12.2 | 0.82 | 5000 | 98.8 | 54.1 |
| December | 7.17 | 40.0 | 1.92 | 2.80 | 0.55 | 0 | 12.8 | 48.7 |
| **Mean** | **7.07** | **72.5** | **2.01** | **5.49** | **0.825** | **1800** | **40.9** | **47.5** |
| **Dry season** | | | | | | | | |
| April | 7.16 | 46.0 | 2.01 | 6.67 | 4.31 | 58 | 18.4 | 43.8 |
| May | 6.55 | 64.0 | 9.25 | 0.36 | 4.43 | 2400 | 23.6 | 39.2 |
| June | 6.98 | 44.0 | 1.88 | 4.84 | 0.18 | 0 | 8.00 | 46.6 |
| July | 7.11 | 44.0 | 3.35 | 7.83 | 0.66 | 0 | 12.4 | 59.2 |
| August | 7.67 | 59.0 | 2.26 | 7.81 | 0.34 | 0 | 14.4 | 51.5 |
| September | 6.51 | 32.0 | 1.92 | 2.33 | 0.08 | 21 600 | 15.2 | 41.7 |
| **Mean** | **7.00** | **48.2** | **3.44** | **4.97** | **1.67** | **4010** | **15.3** | **47** |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **1** | **1** | **0** | **25** | **70** |

**Supplementary table 4:** Water quality data for the 2019 wet and dry seasons at Site 1

| Month | pH | COD (mg/L) | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 7.6 | 28 | 42.6 | 0.20 | 0.55 | 35 600 | 35.2 | 42.6 |
| February | 7.04 | 237 | 44.5 | 5.57 | 8.68 | 209 200 | 198.0 | 44.5 |
| March | 6.86 | 58 | 57.4 | 4.66 | 5.84 | 5800 | 16.0 | 57.40 |
| October | 8.10 | 36 | 58.9 | 13.20 | 1.80 | – | 4.80 | 58.9 |
| November | 7.70 | 134 | 50.2 | 0.02 | 5.92 | – | 52.0 | 50.2 |
| December | 7.3 | 105 | 65.5 | 27.9 | 3.20 | – | 6.40 | 65.5 |
| **Mean** | **7.4** | **100** | **53.2** | **8.59** | **4.33** | | **52.07** | **53.2** |
| **Dry season** | | | | | | | | |
| April | 7.31 | 54.0 | 55.7 | 5.54 | 0.72 | 0 | 22.0 | 55.7 |
| May | 6.82 | 138.0 | 53.2 | 11.9 | 0.04 | 397 200 | 112.0 | 53.2 |
| June | 7.02 | 156.0 | 61.1 | 18.0 | 1.71 | 184 200 | 102.0 | 61.1 |
| July | 7.64 | 38.0 | 46.9 | 7.99 | 0.17 | 154 000 | 12.8 | 46.9 |
| August | 7.37 | 90.0 | 63.6 | 12.2 | 1.46 | 0 | 50.0 | 63.6 |
| September | 6.8 | 208 | 72.63 | 26.6 | 6.10 | 0 | 42.4 | 72.63 |
| **Mean** | **7.2** | **114** | **58.9** | **13.7** | **1.7** | **122 567** | **56.9** | **58.9** |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **1** | **1** | **0** | **25** | **70** |

**White River – Crocodile River confluence (Site 2)**

The tables below show data analysed for Site 2 which is located downstream of Site 1. The site is a confluence point between White River and Crocodile River, and the area is mostly dominated by agricultural land-use activities.

**Supplementary table 5:** Water quality data for the 2017 wet and dry seasons at Site 2

| Month | pH | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|
| **Wet season** | | | | | | |
| January | 7.54 | 0.1 | 0.2 | 0.1 | 65 | 35.20 |
| February | – | – | – | – | – | – |
| March | 7.48 | 0.97 | 0.20 | 0.10 | 1533 | 31.10 |
| October | 7.43 | 0.10 | 0.22 | 0.01 | 4400 | 39.9 |
| November | 7.82 | 0.10 | 0.20 | 0.01 | 19 | 38.10 |
| December | 7.89 | 0.11 | 0.20 | 0.01 | 45 | 31.30 |
| **Mean** | 7.6 | 0.2 | 0.2 | 0.04 | 1212 | 35.12 |
| **Dry season** | | | | | | |
| April | 7.82 | 0.29 | 0.20 | 0.10 | 315 | 34.1 |
| May | 8.23 | 0.18 | 0.20 | 0.10 | 88 | 31 |
| June | 7.85 | 0.10 | 0.20 | 0.10 | 28 | 31.1 |
| July | 7.70 | 0.10 | 0.20 | 0.10 | 15 | – |
| August | 6.99 | 0.12 | 0.20 | 0.10 | 158 | 23.9 |
| September | 7.51 | 0.10 | 0.20 | 0.01 | 1153 | 32.8 |
| **Mean** | 7.68 | 0.15 | 0.20 | 0.085 | 293 | 30.58 |
| **Resource quality objectives** | **6.5–8.5** | **6** | **6** | **0.125** | **130** | **70** |

**Supplementary table 6:** Water quality data for the 2018 wet and dry seasons at Site 2

| Month | pH | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|
| **Wet season** | | | | | | |
| January | 7.29 | 0.10 | 0.20 | 0.01 | 35 | 34.50 |
| February | 7.87 | 0.10 | 0.20 | 0.01 | 145 | 33.80 |
| March | 7.51 | 0.00 | 0.20 | 0.02 | 260 | 29.70 |
| October | 7.64 | 0.10 | 0.20 | 0.01 | 55 | 31.10 |
| November | 7.82 | 0.10 | 0.20 | 0.12 | 75 | 34.20 |
| December | 7.65 | 0.10 | 0.20 | 0.01 | 78 | 33.70 |
| **Mean** | 7.63 | 0.083 | 0.20 | 0.03 | 108 | 33.7 |
| **Dry season** | | | | | | |
| April | 7.40 | 0.10 | 0.20 | 0.02 | 388 | 27.60 |
| May | 7.65 | 0.10 | 0.20 | 0.08 | 50 | 23.30 |
| June | 7.38 | 0.10 | 0.20 | 0.01 | 140 | 29.00 |
| July | 7.38 | 0.10 | 0.20 | 0.01 | 48 | 29.00 |
| August | 7.98 | 0.10 | 0.20 | 0.01 | 78 | 29.80 |
| September | 7.61 | 0.10 | 0.20 | 0.01 | 78 | 27.80 |
| **Mean** | 7.6 | 0.10 | 0.20 | 0.023 | 130.3 | 29.9 |
| **Resource quality objectives** | **6.5–8.5** | **6** | **6** | **0.125** | **130** | **70** |

**Supplementary table 7:** Water quality data for the 2019 wet and dry seasons at Site 2

| Month | pH | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|
| **Wet season** | | | | | | |
| January | 7.92 | 0.10 | 0.20 | 0.01 | 50 | 33.00 |
| February | 7.75 | 0.10 | 0.20 | 0.01 | 65 | 34.50 |
| March | 7.52 | 0.13 | 0.20 | 0.03 | 90 | 34.40 |
| October | 7.70 | 0.10 | 0.01 | 0.07 | – | 28.80 |
| November | 7.90 | 0.10 | 0.02 | 0.02 | – | 21.40 |
| December | 7.90 | 0.10 | 0.02 | 0.10 | – | 41.90 |
| **Mean** | 7.78 | 0.105 | 0.04 | 0.04 | 68.3 | 32.3 |
| **Dry season** | | | | | | |
| April | 7.72 | 0.11 | 0.20 | 0.01 | 170 | 39.20 |
| May | 7.27 | 0.10 | 0.20 | 0.02 | 23 | 24.60 |
| June | 7.31 | 0.10 | 0.20 | 0.01 | 55 | 23.90 |
| July | 7.86 | 0.10 | 0.20 | 0.01 | 8 | 23.40 |
| August | 7.61 | 0.10 | 0.20 | 0.02 | 25 | 22.80 |
| September | 7.67 | 0.15 | 0.05 | 0.02 | – | 28.33 |
| **Mean** | 7.57 | 0.11 | 0.175 | 0.015 | 56.2 | 27.03 |
| **Resource quality objectives** | **6.5–8.5** | **6** | **6** | **0.125** | **130** | **70** |

**Kanyamazane WWTP (Site 3)**

The tables below show data analysed for Site 3 which is located approximately 27 km downstream of Site 2. The wastewater treatment plant treats domestic wastewater from Kanyamazane township and discharges effluent into the Crocodile River**.**

**Supplementary table 8:** Effluent quality limits as per Kanyamazane WWTP water use licence

| Constituents | Limits |
|---|---|
| Electrical conductivity (ms/m) | 75 |
| Nitrite and nitrates (mg/L) | 15 |
| Phosphate (mg/L) | 1 |
| Ammonia-N (mg/L) | 6 |
| Chemical oxygen demand (mg/L) | 75 |
| *E. coli* ( count per mL) | 0 |
| Suspended solids (mg/L) | 25 |
| pH | 5.5–9.5 |

**Supplementary table 9:** Water quality data for the 2017 wet and dry seasons at Site 3

| Month | pH | COD (mg/L) | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 6.81 | 28.00 | 16.70 | 0.20 | 1.09 | 0 | 2.4 | 50.70 |
| February | 7.40 | 25.00 | 14.80 | 0.20 | 0.26 | 22 000 | 4.4 | 52.10 |
| March | 7.36 | 33.00 | 8.94 | 3.18 | 0.84 | 0 | 8.4 | 52.20 |
| October | 7.32 | 46.00 | 13.90 | 2.47 | 2.86 | 0 | 2 | 59.10 |
| November | 7.60 | 34.00 | 15.00 | 0.69 | 4.02 | 0 | 3.2 | 57.80 |
| December | 7.79 | 40.00 | 12.10 | 0.21 | 3.73 | 0 | 0.4 | 53.90 |
| **Mean** | **7.38** | **34.3** | **13.6** | **1.158** | **2.13** | **3666.7** | **3.47** | **54.3** |
| **Dry season** | | | | | | | | |
| April | 7.37 | 20.00 | 13.90 | 1.07 | 0.87 | 0 | 0.4 | 51.50 |
| May | 7.76 | 38.00 | 17.20 | 1.00 | 0.41 | 0 | 6.8 | 55.10 |
| June | 7.47 | 46.00 | 10.70 | 5.25 | 0.94 | 0 | **15.6** | 57.20 |
| July | 7.37 | 20.00 | 13.90 | 4.62 | 0.84 | 0 | 14.8 | 63.60 |
| August | 7.30 | 51.00 | 15.30 | 4.56 | 1.05 | 0 | 10.4 | 64.80 |
| September | 7.44 | 44.00 | 17.40 | 0.36 | 3.33 | 0 | 6.4 | 61.40 |
| **Mean** | **7.45** | **36.5** | **14.7** | **2.81** | **1.24** | **0** | **9.07** | **58.93** |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **6** | **1** | **0** | **25** | **75** |

**Supplementary table 10:** Water quality data for the 2018 wet and dry seasons at Site 3

| Month | pH | COD (mg/L) | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 7.33 | 28.00 | 12.8 | 0.20 | 3.47 | 0 | 3.60 | 53.90 |
| February | 7.42 | 25.00 | 14.1 | 0.20 | 3.70 | 0 | 0.40 | 53.90 |
| March | 7.39 | 33.00 | 12.5 | 0.20 | 3.50 | 0 | 1.20 | 50.30 |
| October | 7.66 | 46.00 | 15.3 | 0.22 | 3.88 | 0 | 0.40 | 59.10 |
| November | 7.63 | 34.00 | 13.1 | 1.64 | 3.82 | 0 | 6.00 | 54.90 |
| December | 7.55 | 40.00 | 15 | 0.94 | 4.26 | 0 | 6.40 | 56.60 |
| **Mean** | **7.49** | **34.3** | **13.8** | **0.57** | **3.77** | **0** | **3.00** | **54.78** |
| **Dry season** | | | | | | | | |
| April | 7.49 | 20.00 | 14.1 | 0.20 | 3.71 | 0 | 0.40 | 51.60 |
| May | 7.53 | 38.00 | 14.8 | 1.19 | 3.36 | 0 | 2.40 | 49.70 |
| June | 7.36 | 46.00 | 16.5 | 0.69 | 2.89 | 0 | 0.80 | 52.80 |
| July | 7.46 | 20.00 | 18 | 1.15 | 3.07 | 0 | 4.00 | 61.00 |
| August | 7.31 | 51.00 | 18.4 | 0.20 | 3.57 | 0 | 3.20 | 63.70 |
| September | 7.46 | 44.00 | 15.8 | 1.40 | 3.34 | 2420 | 8.00 | 61.50 |
| **Mean** | **7.44** | **36.5** | **16.26** | **0.805** | **3.32** | **403.3** | **3.13** | **56.7** |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **6** | **1** | **0** | **25** | **75** |

**Supplementary table 11:** Water quality data for the 2019 wet and dry seasons at Site 3

| Month | pH | COD (mg/L) | $NO_2$ + $NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 7.42 | 25 | 14.10 | 0.2 | 3.7 | 0 | 0.4 | 53.90 |
| February | 7.39 | 33 | 12.50 | 0.2 | 3.5 | 0 | 1.2 | 50.30 |
| March | 7.49 | 20 | 14.10 | 0.2 | 3.71 | 0 | 0.4 | 51.60 |
| October | 7.63 | 34.00 | 13.10 | 1.64 | 3.82 | 0 | 6.00 | 54.90 |
| November | 7.55 | 40.00 | 15.00 | 0.94 | 4.26 | 0 | 6.40 | 56.60 |
| December | 7.80 | 10.00 | 13.80 | 0.20 | 3.55 | 0 | 0.80 | 52.90 |
| **Mean** | **7.54** | **27.0** | **13.8** | **0.56** | **3.76** | **0** | **2.53** | **53.4** |
| **Dry season** | | | | | | | | |
| April | 7.53 | 38 | 14.80 | 1.19 | 3.36 | 0 | 2.4 | 49.70 |
| May | 7.36 | 46 | 16.50 | 0.69 | 2.89 | 0 | 0.8 | 52.80 |
| June | 7.46 | 20 | 18.00 | 1.15 | 3.07 | 0 | 4 | 61.00 |
| July | 7.31 | 51 | 18.40 | 0.2 | 3.57 | 0 | 3.2 | 63.70 |
| August | 7.46 | 44 | 15.80 | 1.4 | 3.34 | 2420 | 8 | 61.50 |
| September | 7.66 | 46 | 15.30 | 0.22 | 3.88 | 0 | 0.4 | 59.10 |
| **Mean** | **7.46** | **40.8** | **16.5** | **0.808** | **3.35** | **403.3** | **3.13** | **58.00** |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **6** | **1** | **0** | **25** | **75** |

**Kanyamazane N4 Bridge (Site 4)**

The tables below show data analysed for Site 4 which is located downstream of Kanyamazane WWTP (Site 3). The area is densely populated and water resource quality is mostly influenced by anthropogenic activities undertaken within the surrounding informal settlements.

**Supplementary table 12:** Water quality data for the 2017 wet and dry seasons at Site 4

| Month | pH | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|
| **Wet season** | | | | | | |
| January | 7.85 | 0.74 | 0.20 | 0.1 | 570 | 18.4 |
| February | 7.99 | 0.79 | 0.20 | 0.1 | 815 | 23.4 |
| March | 7.54 | 0.72 | 0.20 | 0.1 | 1153 | 15.1 |
| October | 7.69 | 1.03 | 0.20 | 0.097 | 440 | 23.9 |
| November | 8.05 | 1.03 | 0.20 | 0.103 | 3065 | 24.4 |
| December | 7.78 | 0.97 | 0.20 | 0.103 | 5230 | 21.3 |
| **Mean** | 7.81 | 0.88 | 0.20 | 0.10 | 1879 | 21.1 |
| **Dry season** | | | | | | |
| April | 7.91 | 0.94 | | 0.1 | 8800 | 21.7 |
| May | 8.17 | 0.96 | | 0.1 | 11 400 | 26.1 |
| June | 8.13 | 1.49 | | 0.12 | 730 | 28.1 |
| July | 8.19 | 1.51 | | 0.1 | 3065 | 31.8 |
| August | 7.54 | 1.67 | | 0.12 | 605 | 30.00 |
| September | 7.88 | 0.87 | | 0.11 | 115 | 29.2 |
| **Mean** | 7.97 | 1.24 | | 0.108 | 4119 | 27.8 |
| **Resource quality objectives** | **6.5–8.5** | **6** | **6** | **0.125** | **130** | **70** |

**Supplementary table 13:** Water quality data for the 2018 wet and dry seasons at Site 4

| Month | pH | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|
| **Wet season** | | | | | | |
| January | 6.32 | 1.09 | 0.2 | 0.09 | 2440 | 25.4 |
| February | 8.08 | 0.80 | 0.2 | 0.06 | 2055 | 22.90 |
| March | 7.54 | 0.86 | 0.2 | 0.1 | 1380 | 21.00 |
| October | 7.85 | 1.08 | 0.2 | 0.15 | 545 | 27.10 |
| November | 7.88 | 0.93 | 0.2 | 0.13 | 525 | 23.50 |
| December | 7.82 | 0.94 | 0.2 | 0.18 | 9930 | 23.40 |
| **Mean** | 7.6 | 0.95 | 0.2 | 0.12 | 2812 | 23.9 |
| **Dry season** | | | | | | |
| April | 7.67 | 0.94 | 0.2 | 0.11 | 575 | 0.90 |
| May | 7.63 | 1.32 | 0.2 | 0.16 | 895 | 22.50 |
| June | 7.69 | 0.96 | 0.2 | 0.16 | 4900 | 26.30 |
| July | 7.82 | 1.31 | 0.2 | 0.22 | 5230 | 31.50 |
| August | 7.76 | 0.89 | 0.2 | 0.16 | 595 | 30.80 |
| September | 7.91 | 1.14 | 0.2 | 0.17 | 1050 | 32.40 |
| **Mean** | 7.7 | 1.09 | 0.2 | 0.16 | 2207 | 24.06 |
| **Resource quality objectives** | **6.5–8.5** | **6** | **6** | **0.125** | **130** | **70** |

**Supplementary table 14:** Water quality data for the 2019 wet and dry seasons at Site 4

| Month | pH | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|
| **Wet season** | | | | | | |
| January | 7.68 | 0.80 | 0.2 | 0.05 | 3245 | 22.30 |
| February | 7.85 | 0.77 | 0.2 | 0.11 | 4330 | 21.10 |
| March | 7.55 | 1.08 | 0.2 | 0.11 | 655 | 23.60 |
| October | 7.60 | 1.54 | 0.02 | 0.35 | – | 33.40 |
| November | 8.70 | 1.20 | 0.10 | 0.04 | – | 21.40 |
| December | - | 13.00 | 0.02 | 0.40 | – | 33.00 |
| **Mean** | 7.65 | 3.07 | 0.123 | 0.176 | 2743 | 25.8 |
| **Dry season** | | | | | | |
| April | 7.88 | 1.09 | 0.2 | 0.07 | 1935 | 25.70 |
| May | 7.69 | 1.02 | 0.2 | 0.12 | 135 | 28.50 |
| June | 8.08 | 1.14 | 0.2 | 0.11 | 140 | 31.70 |
| July | 8.09 | 0.88 | 0.2 | 0.12 | 153 | 31.50 |
| August | 8.09 | 1.03 | 0.2 | 0.17 | 235 | 32.90 |
| September | 7.96 | 1.19 | 0.02 | 0.20 | – | 31.14 |
| **Mean** | 7.70 | 1.92 | 0.17 | 0.13 | 519 | 30.24 |
| **Resource quality objectives** | **6.5–8.5** | **6** | **6** | **0.125** | **130** | **70** |

**Matsulu WWTP (Site 5)**

The tables below show data analysed for Site 5 which is located downstream of Site 4. The wastewater treatment plant treats domestic wastewater from Matsulu township and discharges effluent into the Crocodile River. The plant is situated in a residential area that is also dominated by agricultural land-use activities**.**

**Supplementary table 15:** Effluent quality limits as per Matsulu WWTP water use licence

| Constituents | Limits |
|---|---|
| Electrical conductivity (ms/m) | 70 |
| Nitrite and nitrates (mg/L) | 15 |
| Phosphate (mg/L) | 1 |
| Chemical oxygen demand (mg/L) | 75 |
| Ammonia-N (mg/L) | 3 |
| *E. coli* (count per mL) | 0 |
| Suspended solids (mg/L) | 25 |
| pH | 5.5–9.5 |

**Supplementary table 16:** Water quality data for the 2017 wet and dry seasons at Site 5

| Month | pH | COD (mg/L) | $NO_2$ + $NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 7.63 | 10.00 | 4.72 | 0.2 | 1.82 | 0 | 1.6 | 50.6 |
| February | 7.71 | 26.00 | 7.29 | 0.2 | 1.73 | 0 | 3.6 | 57.4 |
| March | 7.7 | 10.00 | 5.12 | 0.2 | 0.53 | 0 | 0.4 | 54.4 |
| October | 7.38 | 27.00 | 6.11 | 0.2 | 1.78 | 0 | 0.8 | 59.4 |
| November | 7.8 | 10.00 | 6.51 | 0.2 | 1.91 | 46 | 1.2 | 56.4 |
| December | 7.79 | 12.00 | 5.58 | 0.2 | 1.77 | 0 | 0.4 | 59.7 |
| **Mean** | 7.6 | 15.8 | 5.9 | 0.2 | 1.59 | 7.67 | 1.33 | 56.3 |
| **Dry season** | | | | | | | | |
| April | 6.99 | 12.00 | 6.93 | 0.2 | 0.36 | 0 | 0.4 | 52.5 |
| May | 8.26 | 18.00 | 6.7 | 0.2 | 1.12 | 0 | 0.4 | 57.8 |
| June | 7.53 | 41.00 | 8.55 | 0.2 | 1.78 | 0 | 4.00 | 58.8 |
| July | 7.53 | 16.00 | 7.86 | 0.2 | 2.72 | 0 | 0.4 | 64.9 |
| August | 7.58 | 31.00 | 7.1 | 0.2 | 2.72 | 0 | 1.2 | 62.5 |
| September | 7.51 | 10.00 | 8.35 | 0.2 | 5.32 | 0 | 4.4 | 63.6 |
| **Mean** | 7.6 | 31.3 | 7.58 | 0.2 | 2.34 | 0 | 1.36 | 60.3 |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **3** | **1** | **0** | **25** | **70** |

**Supplementary table 17:** Water quality data for the 2018 wet and dry seasons at Site 5

| Month | pH | COD (mg/L) | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 7.51 | 10 | 8.01 | 0.2 | 2.56 | 0 | 0.4 | 60.1 |
| February | 7.69 | 10 | 5.78 | 0.2 | 2.56 | 0 | 0.4 | 54.4 |
| March | 7.46 | 16 | 5.00 | 0.2 | 1.66 | 0 | 0.4 | 55.8 |
| October | 7.67 | 42 | 7.68 | 0.2 | 2.62 | 1 | 2 | 62.70 |
| November | 7.82 | 20.00 | 7.99 | 0.2 | 3.02 | 0.00 | 0.40 | 66.50 |
| December | 7.62 | 14.00 | 4.36 | 0.2 | 2.84 | 0.00 | 2.00 | 60.60 |
| **Mean** | 7.6 | 18.7 | 6.47 | 0.2 | 2.54 | 0.167 | 0.933 | 60.02 |
| **Dry season** | | | | | | | | |
| April | 7.58 | 26 | 6.23 | 0.2 | 2.38 | 0 | 0.4 | 61.3 |
| May | 7.03 | 14 | 7.41 | 0.2 | 1.91 | 0 | 0.4 | 55.30 |
| June | 6.97 | 22 | 7.23 | 0.2 | 2.65 | 0 | 0.4 | 58.00 |
| July | 7.56 | 10 | 11.70 | 0.2 | 2.63 | 0 | 0.4 | 65.60 |
| August | 7.69 | 23 | 8.28 | 0.2 | 1.83 | 0 | 1.2 | 68.80 |
| September | 7.98 | 14 | 5.19 | 0.2 | 0.88 | 0 | 0.4 | 69.60 |
| **Mean** | 7.5 | 18.2 | 7.67 | 0.2 | 2.05 | 0 | 0.53 | 63.0 |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **3** | **1** | **0** | **25** | **70** |

**Supplementary table 18:** Water quality data for the 2019 wet and dry seasons at Site 5

| Month | pH | COD (mg/L) | $NO_2$ + $NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 7.63 | 10.00 | 5.36 | 0.2 | 2.04 | 0 | 0.40 | 60.90 |
| February | 7.80 | 12.00 | 6.36 | 0.2 | 2.57 | 0 | 0.40 | 59.20 |
| March | 7.68 | 14.00 | 6.48 | 0.2 | 1.59 | 0 | 4.40 | 60.80 |
| October | 7.70 | 12.00 | 8.14 | 4.9 | 4.70 | – | 0.80 | 78.20 |
| November | 7.50 | – | 6.33 | 0.02 | 0.70 | – | 0.40 | 57.50 |
| December | 7.60 | 61.00 | 7.25 | 0.1 | 2.00 | – | 0.40 | 77.20 |
| **Mean** | 7.7 | 21.8 | 6.65 | 0.94 | 2.27 | 0 | 1.13 | 65.6 |
| **Dry season** | | | | | | | | |
| April | 8.04 | 22.00 | 7.60 | 0.2 | 2.32 | 1.00 | 0.40 | 66.90 |
| May | 7.64 | 14.00 | 6.70 | 0.2 | 1.83 | 0.00 | 0.40 | 64.60 |
| June | 7.44 | 24.00 | 5.36 | 0.2 | 2.97 | 0.00 | 0.40 | 71.10 |
| July | 8.18 | 21.00 | 11.60 | 0.2 | 2.63 | 0.00 | 0.40 | 80.60 |
| August | 7.70 | 16.00 | 7.35 | 0.2 | 1.91 | 184.00 | 1.20 | 79.50 |
| September | 7.77 | – | 8.77 | 0.02 | 0.80 | – | 2.00 | 67.35 |
| **Mean** | 7.8 | 19.4 | 7.90 | 0.17 | 2.08 | 37.00 | 0.8 | 71.68 |
| **Resource quality objectives** | **5.5–9.5** | **75** | **15** | **3** | **1** | **0** | **25** | **70** |

**Downstream Komatipoort WWTP (Site 6)**

The tables below show data analysed for Site 6 which is located approximately 50 m downstream of Komatipoort WWTP. which primarily treats domestic wastewater from Komatipoort Town. The area is mostly dominated by agricultural land-use activities (sugar cane, maize).

**Supplementary table 19:** Water quality data for the 2017 wet and dry seasons at Site 6

| Month | pH | COD (mg/L) | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 8.25 | – | 5.83 | 0.2 | 0.10 | 415 | – | 130.00 |
| February | 8.26 | – | 6.86 | 0.2 | 0.21 | 38 825 | – | 128.20 |
| March | 8.18 | – | 6.69 | 0.2 | 0.22 | 590 | – | 129.00 |
| October | 7.9 | – | 7.64 | 0.2 | 0.73 | 2040 | – | 130.00 |
| November | 8.11 | – | 8.71 | 0.2 | 0.16 | 345 | – | 131.00 |
| December | 8.15 | – | 8.6 | 0.2 | 0.04 | 288 | – | 136.00 |
| **Mean** | **8.15** | – | **7.39** | **0.2** | **0.242** | **7083.8** | – | **130.7** |
| **Dry season** | | | | | | | | |
| April | 8.3 | – | 7.87 | 0.2 | 0.10 | 233 | – | 126.00 |
| May | 8.32 | – | 8.96 | 0.2 | 0.10 | 430 | – | 126.00 |
| June | 8.3 | – | 7.37 | 0.64 | 0.42 | 278 | – | 127.00 |
| July | 8.32 | – | 8.04 | 1.05 | 0.33 | 158 | – | 129.00 |
| August | 7.84 | – | 10.00 | 0.2 | 0.64 | 278 | – | 121.60 |
| September | 8.24 | – | 9.01 | 0.2 | 0.02 | 98 | – | 128.00 |
| **Mean** | **8.22** | – | **8.25** | **0.415** | **0.267** | **245.8** | – | **126.3** |
| **Resource quality objectives** | **6.5–8.5** | – | **6** | **6** | **0.125** | **130** | – | **70** |

**Supplementary table 20:** Water quality data for the 2018 wet and dry seasons at Site 6

| Month | pH | COD (mg/L) | $NO_2 + NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 8.11 | – | 9.59 | 0.20 | 0.04 | 295 | – | 128 |
| February | 7.97 | – | 5.15 | 0.68 | 1.34 | 6050 | – | 127.00 |
| March | 8.20 | – | 9.74 | 0.20 | 0.05 | 1028 | – | 123.70 |
| October | 7.80 | – | 9.13 | 0.36 | 0.52 | 650 | – | 138.00 |
| November | 8.05 | – | 8.47 | 0.42 | 1.56 | 295 | – | 138.00 |
| December | 8.20 | – | 11.00 | 0.20 | 0.02 | 1153 | – | 139.00 |
| **Mean** | **8.05** | – | **8.85** | **0.343** | **0.588** | **1578.5** | – | **132.3** |
| **Dry season** | | | | | | | | |
| April | 8.19 | – | 10.20 | 0.20 | 0.03 | 570 | – | 137.00 |
| May | 8.22 | – | 9.41 | 0.20 | 0.53 | 193 | – | 128.00 |
| June | 7.98 | – | 9.93 | 0.35 | 0.47 | 270 | – | 127.00 |
| July | 8.00 | – | 9.20 | 0.20 | 0.22 | 463 | – | 125.70 |
| August | 8.58 | – | 9.49 | 1.09 | 0.60 | 1153 | – | 132.00 |
| September | 7.97 | – | 11.10 | 0.20 | 0.47 | 1028 | – | 134.00 |
| **Mean** | 8.15 | – | 9.89 | 0.373 | 0.387 | 612.8 | – | 130.6 |
| **Resource quality objectives** | **6.5–8.5** | **75** | **6** | **6** | **0.125** | **130** | **25** | **70** |

**Supplementary table 21:** Water quality data for the 2019 wet and dry seasons at Site 6

| Month | pH | COD (mg/L) | $NO_2$ + $NO_3^-$ (mg/L) | $NH_3$ (mg/L) | $PO_4$ (mg/L) | *E. coli* | Suspended solids (mg/L) | Electrical conductivity (ms/m) |
|---|---|---|---|---|---|---|---|---|
| **Wet season** | | | | | | | | |
| January | 7.78 | – | 6.84 | 0.20 | 1.21 | 4965 | – | 140.00 |
| February | 8.28 | – | 9.66 | 0.20 | 0.90 | 475 | – | 135.00 |
| March | 8.06 | – | 8.33 | 0.20 | 0.49 | 680 | – | 126.00 |
| October | 7.40 | – | 12.40 | 4.10 | 3.80 | – | – | 66.50 |
| November | 7.90 | – | 14.20 | 0.02 | 0.19 | – | – | 12.30 |
| December | 8.20 | – | 9.79 | 0.02 | 5.10 | – | – | 135.90 |
| **Mean** | **7.94** | – | **10.2** | **0.79** | **1.94** | **2040** | – | **102.6** |
| **Dry season** | | | | | | | | |
| April | 7.89 | – | 9.30 | 0.65 | 1.13 | 3 | – | 132.00 |
| May | 8.16 | – | 4.82 | 0.20 | 0.25 | 4965 | – | 92.40 |
| June | 8.18 | – | 9.90 | 1.43 | 0.81 | 0 | – | 133.00 |
| July | 8.15 | – | 11.50 | 1.45 | 0.75 | 0 | – | 137.00 |
| August | 8.07 | – | 11.30 | 1.13 | 0.52 | 403 | – | 145.00 |
| September | 8.12 | – | 12.90 | 0.02 | 0.02 | – | – | 136.00 |
| **Mean** | **8.095** | – | **9.95** | **0.813** | **0.58** | **917.8** | – | **129.2** |
| **Resource quality objectives** | **6.5–8.5** | **75** | **6** | **6** | **0.125** | **130** | **25** | **70** |