No. 42451 121

DEPARTMENT OF WATER AND SANITATION

NO. 655

10 MAY 2019

NATIONAL WATER ACT, 1998 (ACT NO.36 OF 1998)

PROPOSED CLASSES OF WATER RESOURCE AND RESOURCE QUALITY OBJECTIVES FOR THE BERG CATCHMENT

I, Gugile Nkwinti, in my capacity as Minister of Water and Sanitation and duly authorised in terms of Section 13(4) of the National Water Act, 1998 (Act No. 36 of 1998) hereby publish, the notice for the proposed classes of water resources and the proposed resource quality objectives for the Berg Catchment.

Any person who wishes to submit written comments with regard to the proposed classes of water resources and the proposed resource quality objectives should submit the comments within 60 days from the date of publication of this Notice to:

Director: Water Resource Classification Attention: Ms Lebogang Matlala Department of Water and Sanitation Ndinaye Building 5046 178 Francis Baard Street Private Bag x 313 Pretoria 0001 Facsimile: 012 336 6712 Email: matlalal@dws.gov.za

MR NEWINTIGE (MP) MINISTER OF WATER AND SANITATION DATE: 22/02/20/9 122 No. 42451

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SCHEDULE

DESCRIPTION OF THE WATER RESOURCE

The proposed water resource classes and resource quality objectives are determined for all or part of every significant water resource as set out below:

| Water Management Area: | Berg-Olifants Water Management Area |
|------------------------|--|
| Drainage Region: | G1, G2 Secondary Drainage Region and G40A Quaternary Drainage Region |
| River(s): | The Berg River is the largest river in the study area, which also includes a number of smaller catchments within the City of Cape Town Metropolitan area such as the Diep, Kuils, Eerste, Lourens, Sir Lowry's, Steenbras, as well as various small catchments on the Cape Peninsula and along the West Coast. |

A. PROPOSED WATER RESOURCE CLASSES AS REQUIRED IN TERMS OF SECTION 13(4)(a)(i)(aa) OF THE NATIONAL WATER ACT, 1998

- i. The proposed water resource classes for the Berg Catchment are listed in Table 1 according to the overall class per integrated unit of analysis (IUA), indicated in Figure 1.
- ii. IUAs are classified as either Class I: indicating high environmental protection and minimal utilisation; Class II indicating moderate protection and moderate utilisation; and Class III indicating sustainable minimal protection and high utilisation.
- iii. Table 1 provides the IUA, the recommended water resource class and its respective catchment configuration. The catchment configuration consists of a number of biophysical nodes representing river reaches or river resource units (RUs). The target ecological category (TEC) to be achieved or maintained for each RU in the IUA is provided.
- iv. It is important to note that additional existing geographically defined areas of specific ecological importance for water resources such as protected areas (e.g. Table Mountain National Park), critical biodiversity areas (CBAs), national freshwater environmental protection areas (NFEPAs) and the strategic water source areas (SWSA) should also be considered in terms of the recommended resource classes as these would indicate areas of specific importance that should be managed in a higher resource class (e.g. Class I) than would be the case for the average of all resource units across the IUA (e.g. in a Class II).

B. RESOURCE QUALITY OBJECTIVES OF WATER RESOURCES AS REQUIRED IN TERMS OF SECTION 13(4)(a)(i)(bb) OF THE NATIONAL WATER ACT, 1998

- i. Resource Quality Objectives (RQOs) are defined for prioritised RUs for each IUA in terms of water quantity, habitat and biota, and water quality. Prioritised RUs are indicated in Figure 1.
- ii. Table 2 to Table 10 provide the RQOs for RIVERS in priority RUs.
- iii. Table 11 to Table 17 provide the RQOs for ESTUARIES in priority RUs.
- iv. Table 18 provides the RQOs for DAMS in priority RUs
- v. Table 19 provides the RQOs for GROUNDWATER in priority RUs.
- vi. RQOs will apply from the date signed off as determined in terms of Section 13(1) of the National Water Act, 1998, unless otherwise specified by the Minister.

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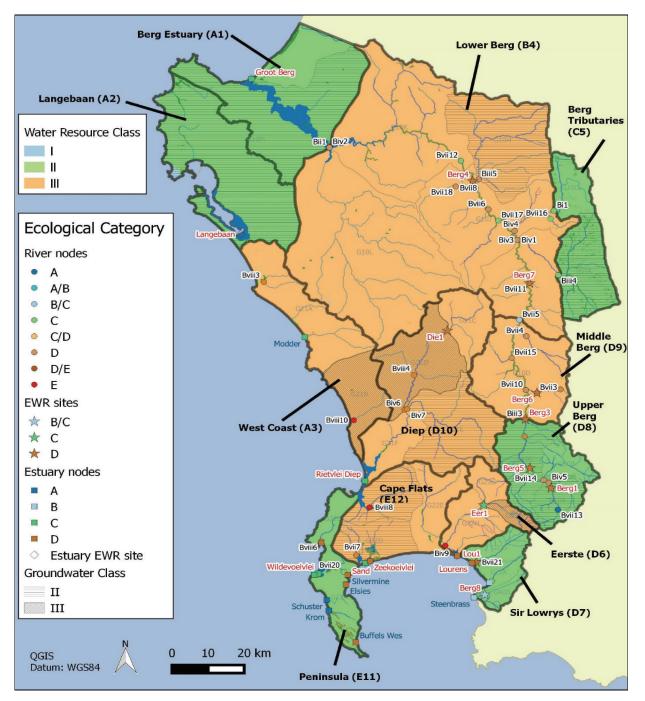


Figure 1: Proposed Water Resource Classes for the Berg Catchment

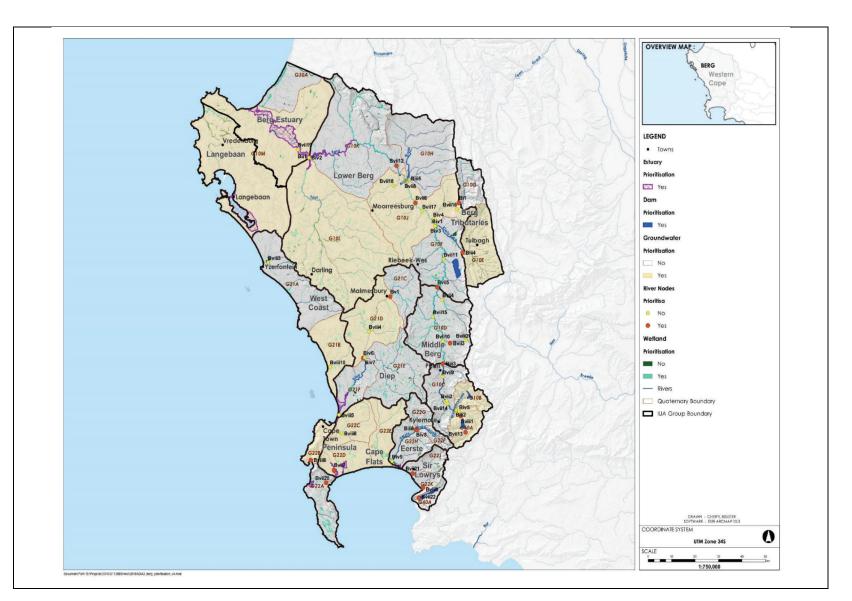


Figure 2: Proposed Priority Resource Units for the Berg Catchment

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| Integrated Unit of Analysis (IUA) | Water Resource Class for IUA | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | % nMAR* |
|--------------------------------------|---------------------------------|-------------------------|---------|----------------------|-----------------------|-----|------------|
| A1 Berg Estuary | 11 | G10M | A1-E01 | Berg (Groot) | Bxi1 | С | 52 |
| A2 Langebaan | 1 | G10M | A2-E04 | Langebaan | Bxi3 | Α | N/A |
| | | G10A | D8-R01 | Berg | Bvii13 | Α | 98 |
| D8 Upper Berg | Ш | G10A | D8-R02 | Berg | Bviii1 | С | 27 |
| | | G10C | D8-R03 | Berg | Biii3 | D | 53 |
| | | G10C | D9-R04 | Pombers | Bviii11 | С | 366 |
| D9 Middle Berg | Ш | G10D | D9-R05 | Kromme | Bvii3 | D | 89 |
| | | G10D | D9-R06 | Berg | Bvii5 | D | 49 |
| OF Dave Tributarias | | G10E | C5-R07 | Klein Berg | Biii4 | С | 82 |
| C5 Berg Tributaries | II | G10G | C5-R08 | Vier-en-Twintig | Bi1 | B/C | 23 |
| D4 Louise Dave | | G10J | B4-R09 | Berg | Bvii6 | D | 52 |
| B4 Lower Berg | III | G10K | B4-R10 | Berg | Bvii12 | D | 51 |
| | | G21D | D10-R11 | Diep | Bv1 | D | 66 |
| D10 Diep | Ш | G21D | D10-R12 | Diep | Biv6 | D | 68 |
| | | G21F | D10-E03 | Rietvlei/ Diep | Bxi7 | С | 78 |
| | | G22B | E11-R13 | Hout Bay | Bviii6 | D | 97 |
| E11 Peninsula | Ш | G22A | E11-R14 | Silvermine | Bvii20 | С | 98 |
| | | G22A | E11-E04 | Wildevöelvlei | Bxi14 | С | 107 |
| | | G22D | E12-R15 | Keysers | Bvii7 | D | 93 |
| E12 Cape Flats | Ш | G22K | E12-E05 | Zandvlei | Bxi9 | С | 93 |
| | | G22K | E12-E05 | Zeekoevlei | Bxi9 | D | N/A |
| | | G22F | D6-R16 | Eerste (Jonkershoek) | Biii6 | С | 93 |
| D6 Eerste | Ш | G22G | D6-R17 | Klippies | Biv8 | D | 77 |
| | | G22H | D6-E06 | Eerste | Bxi3 | D | 90 |
| | | G22J | D7-R18 | Lourens | Bvii21 | D | 114 |
| D7 Sir Lourdo | | G22K | D7-R19 | Sir Lowry's Pass* | Bviii9 | С | 84 |
| D7 Sir Lowry's | II | G40A | D7-R20 | Steenbras | Bvii22 | B/C | 81 |
| | | G22J | D7-E07 | Lourens | Bxi4 | D | 85 |

Table 1: Summary of recommended Water Resource Classes for each IUA and the Target Ecological Category (TEC) for priority biophysical river and estuary nodes

*Note: This is based on the estimated/simulated flow requirement in the system to meet downstream TECs as well as with current demands. Note that this will differ from the minimum flow requirement to meet the EWR at any given node. In some cases, the flow is above 100% of natural due to the impact of releases to meet downstream demands.

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Quaternary Resource **Biophysical** IUA Class RU TEC **RQO** Narrative **RQO Numeric** Component Sub-component Indicator Catchment Name Node Name Vay oct 202 Dec Jan Feb Mar Apr nn Aug Months 3 Maintenance low 1.149 0.640 2.328 3.706 Maintenance flows (million cubic metres) 3.209 0.695 1.107 4.569 2.041 0.771 4.707 Low Low flows flows Flows sufficient to maintain Quantity High flows Maintenance high the river in an A category flows High 0.440 0.073 0.000 0.000 0.000 0.000 0.000 3.153 4.160 0.664 1.327 2.022 Phosphate (PO₄-P) River nutrient levels must be ≤ 0.025 milligrams per litre (50th percentile) Nutrients Total inorganic maintained in an oligotrophic ≤ 0.70 milligrams per litre (50th percentile) nitrogen (TIN) condition. Salt concentrations need to be Electrical conductivity maintained at levels that do ≤ 30 milliSiemens/metre EC (95th percentile) Salts (EC) not adversely affect aquatic ecosystems pH, temperature, and $5.0 \le pH \le 7.0$ (5th and 95th percentiles) pH range dissolved oxygen are important System variables Quality Dissolved oxygen for the maintenance of $DO \ge 8$ milligrams per litre (5th percentile) ecosystem health. **38 Upper Berg** Berg River Unimpacted catchment, no D8-R01 G10A N/A concerns about toxic N/A Toxins = Bvii13 А substances Concentrations of waterborne pathogens should be E coli maintained in an Ideal 95%tile ≤ 130 cfu/100ml E coli / Faecal coliforms Pathogens category for full contact recreation D50 Geomorphology Sand particle size 0.860 > D50 > 0.275 VEGRAI level 3 score. Vegetation condition > 62% = C category Exotic species No exotic plant species. Terrestrial woody No terrestrial woody species. species Marginal zone cover Indigenous riparian Cover 5-25%. Habitat woody species abundance Riparian vegetation Non-woody indigenous Cover 25-50%. species Reeds No reeds Cover < 5%. Exotic species Terrestrial woody Lower zone cover abundance Cover < 10%. species

Table 2: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis D8 Upper Berg

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|---------------|-------|-------------------------|------------|------------------|--------------------------|-----|-----------|------------------|--------------------------------------|--|---|
| | | | | | | | | | Indigenous riparian | | Cover 25-60% |
| | | | | | | | | | woody species | _ | |
| | | | | | | | | | Non-woody indigenous | 5 | Cover 25-50% |
| | | | | | | | | | species | - | N e vere de |
| | | | | | | | | | Reeds | | No reeds Cover < 10%. |
| | | | | | | | | | Exotic species Terrestrial woody | - | Cover < 10%. |
| | | | | | | | | | species | | Cover = 15%.</td |
| | | | | | | | | | Indigenous riparian woody species | Upper zone cover abundance | Cover 25-50% |
| | | | | | | | | | Non-woody indigenous species | 5 | Cover 40-70%. |
| | | | | | | | | | FRAI score | Fish condition | > 80% = B category |
| | | | | | | | | | Number of indigenous | | Three species present: Sandelia capensis, Galaxia |
| | | | | | | | | Fish | fish species. | - | zebratus and Pseudobarbus burgi |
| | | | | | | | | | Sandelia capensis | | FROC = 5 |
| | | | | | | | | | Galaxias zebratus | Indigenous species richness | FROC = 5 FROC = 5 |
| | | | | | | | Biota | | Pseudobarbus burgi | - | No increase in the number of exotic fish present: |
| | | | | | | | | | Exotic fish species | | Onchorhyncus mykiss (FROC = 5) |
| | | | | | | | | | MIRAI score | 1 | > 78 % = B/C category |
| | | | | | | | | Invertebrates | SASS5 and ASPT score | | SASS5 score >180, ASPT ≥ 7.2. |
| | | | | | | | | | Number of families | Diversity of invertebrate community | >/= 23 families, at an abundance of A to C. |
| | | | | | | | | | | | Mouths Oct Oct Jul Jul Jul Jul |
| | | | | | | | Quantity | Low flows | Maintenance low flows | Flows sufficient to maintain | ance lillion Low 2.143 1.293 1.293 0.803 0.803 0.726 0.803 1.296 2.679 4.147 4.147 4.285 3.888 |
| erg | | | | | | | | High flows | Maintenance high flows | the river in a C category | Maintenance flows (million cubic metres) High Low 0.000 2.1.2 0.544 1.2 0.500 0.8 0.000 0.8 0.000 0.8 0.000 0.778 0.778 1.2 0.778 1.2 0.700 2.6 0.000 2.6 0.000 2.6 0.000 3.8 0.000 3.8 |
| er Be | | Ą | 0 2 | liver | | | | | Phosphate (PO₄-P) | Nutrient levels must be | ≤ 0.025 milligrams per litre (50th percentile) |
| D8 Upper Berg | = | G10A | D8-R02 | Berg River | Bviii1 | С | | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at an oligotrophic condition. | ≤ 0.70 milligrams per litre (50th percentile) |
| Δ | | | | | | | Quality | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at levels that do not adversely affect aquatic ecosystems | ≤ 30 milliSiemens/metre (95th percentile) |
| | | | | | | | | System variables | pH range | pH, temperature, and | $4.5 \ge pH \le 7.5$ (5th and 95th percentiles) |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | t 2°C difference from ambient water temperature |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--------------------------------------|---|---|
| | | | | | | | | | Dissolved oxygen | for the maintenance of ecosystem health. | DO ≥ 8 milligrams per litre (5th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Ideal category for full contact recreation. | ≤ 130 counts/100ml (95th percentile) |
| | | | | | | | | Geomorphology | D50 | Sand particle size | 0.521 > D50 > 0.319 |
| | | | | | | | | | VEGRAI level 3 score. | Vegetation condition | > 62% = C category |
| | | | | | | | | | Exotic species | | No exotic plant species. |
| | | | | | | | | | Terrestrial woody species | | No terrestrial woody species. |
| | | | | | | | | | | Marginal zone cover abundance | Cover < 10%. |
| | | | | | | | | | Non-woody indigenous species | - | Cover 50-75%. |
| | | | | | | | Habitat | Riparian | Reeds | | No reeds |
| | | | | | | | | vegetation | Exotic species | | Cover < 5%. |
| | | | | | | | | | Terrestrial woody | | Cover < 10%. |
| | | | | | | | | | species | | |
| | | | | | | | | | Indigenous riparian woody species | Lower zone cover abundance | Cover 50-75%. |
| | | | | | | | | | Non-woody indigenous species | | Cover 25-50%. |
| | | | | | | | | | Reeds | - | No reeds |
| | | | | | | | | | FRAI score | Fish condition | > 62% = C category |
| | | | | | | | | | Number of indigenous fish species. | | One species present: Sandelia capensis |
| | | | | | | | | Fish | Sandelia capensis | Indigenous species richness | FROC = 5 |
| | | | | | | | Biota | | Exotic fish species | · · · | No increase in the number of exotic fish present: <i>Micropterus dolomieu</i> (FROC = 5) |
| | | | | | | | | | MIRAI score | Macroinvertebrate condition | > 62%= C category |
| | | | | | | | | Invertabratas | SASS5 and ASPT score | SASS scores | SASS5 score >134, ASPT ≥ 6.1. |
| | | | | | | | | Invertebrates | Number of families | Diversity of invertebrate community | >/= 21 families, at an abundance of A to C. |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | | RQ | O N | lum | eric | | | | | | | | | | | |
|---------------|-------|-------------------------|--------|------------------|--------------------------|-----|-----------|-------------------------|--|---|--|--------------|-------|-------|-----------|------------------|--|------------|--------|--------|-------|-------|------|------|-------|---|--|--|
| | | | | | | | | | | | Months | | | | Jan | Feb | Mar | May | n I | Aug | Sep | | | | | | | |
| | | | | | | | Quantity | Low flows High flows | Maintenance low flows Maintenance high | Flows sufficient to maintain the river in a D category | Maintenance flows (million cubic metres) | Low | 5.803 | 1 612 | 1.612 | 1.456 | 1.612 A 368 | 8.382 | 9.776 | 10.102 | 8.112 | | | | | | | |
| | | | | | | | | | flows | | Maintena (millio met | High | 0.000 | | 1.721 | 0.000 | 0.000 | 0.000 | 10.525 | 0.000 | 0.000 | | | | | | | |
| | | | | | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.075 mi | lligr | ram | s/lit | re (| 50th | per | centi | le) | | | | | | | | | |
| | | | | | | | | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at a mesotrophic or better condition. | ≤ 1.75 mill | igra | ıms, | /litr | e (5 | 0th | perce | entile | :) | | | | | | | | | |
| D8 Upper Berg | | Q | 03 | Berg River | Biii3 | | | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at levels that do not adversely affect aquatic ecosystems | ≤ 55 milliSi | iem | ens | /me | etre | (95t | h pe | rcen | ile) | | | | | | | | |
| bpe | = | G10C | D8-R03 | 8 | Biii3 | D | | | pH range | pH, temperature, and | 6.5 ≤ pH ≤ | 8.5 | (5t | h ar | nd 9 | 5th j | perce | entile | s) | | | | | | | | | |
| 8 | | - | | Be | | | Quality | System variables | Water temperature | dissolved oxygen are important | 2°C differe | nce | frc | om a | mb | ient | wate | er tei | nper | ature | e | | | | | | | |
| | | | | | | | Quanty | | Dissolved oxygen | for the maintenance of ecosystem health. | DO ≥ 6 mil | ligra | ams | pe | r litr | e (5 | th pe | ercer | tile) | | | | | | | | | |
| | | | | | | | | | Ammonia | Toxicity levels must not pose a | ≤ 0.073 mi | lligr | ram | s pe | er lit | re (S | 95th | perc | entile | e) | | | | | | | | |
| | | | | | | | | Toxins | Atrazine | threat to aquatic ecosystems. | ≤ 0.079 mi | lligr | ram | s pe | er lit | re (S | 95th | perc | entile | 2) | | | | | | | | |
| | | | | | | | | | Endusulfan | . , | ≤ 0.0013 m | nillig | grar | ns p | oer l | itre | (95tł | n per | centi | le) | | | | | | | | |
| | | | | | | | | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for intermediate contact recreation. | ≤ 4000 cou | unts | /10 | 0m | l (95 | th p | erce | ntile | 1 | | |
| | | | | | | | | Geomorphology | D16, D50, D84 | Sediment particle size | | | | | | | | | | | | | | | | | | |
| | | | | | | | Habitat | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 38% = D/ | /E ca | ate | gory | / | | | | | | | | | | | | | |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 58% C/D | cat | ego | ory | | | | | | | | | | | | | | |

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Quaternary Resource **Biophysical** IUA Class RU TEC Component Sub-component Indicator **ROO** Narrative **RQO Numeric** Catchment Name Node Name -eb Mar May Jun Aug Sep Voct Dec an Apr ٦ Months Maintenance low 10.082 12.024 11.405 3.544 4.752 7.862 8.464 589 2.677 2.572 928 100 flows (million cubic metres) Low Maintenance Low flows flows Flows sufficient to maintain Quantity High flows Maintenance high the river in a C category 1.615 0.000 0.000 0.000 0.000 0.000 1.615 0.000 4.153 4.153 21.48 8.076 flows High Phosphate (PO₄-P) ≤ 0.025 milligrams/litre (50th percentile) Nutrient levels must be Total inorganic Nutrients maintained in the river at an ≤ 0.70 milligrams/litre (50th percentile) nitrogen (TIN) oligotrophic condition. Salt concentrations need to be Electrical conductivity maintained at levels that do Salts \leq 30 milliSiemens/metre (95th percentile) (EC) not adversely affect aquatic D9 Middle Berg Pombers River ecosystems D9-R04 pH range pH, temperature, and $6.5 \le pH \le 8.5$ (5th and 95th percentiles) G10C Ξ Bviii11 С dissolved oxygen are important 2°C difference from ambient water temperature Water temperature System variables for the maintenance of Quality Dissolved oxygen $DO \ge 8$ milligrams litre (5th percentile) ecosystem health. ≤ 0.073 milligrams per litre (95th percentile) Ammonia Toxicity levels must not pose a ≤ 0.079 milligrams per litre (95th percentile) Toxins Atrazine threat to aquatic ecosystems. Endusulfan ≤ 0.0013 milligrams per litre (95th percentile) Concentrations of waterborne pathogens should be Pathogens Escherichia coli maintained in an Acceptable ≤ 600 counts/100ml (95th percentile) category for full contact recreation. Geomorphology GAI score -Geomorphological condition > 38% D/E category Habitat Riparian VEGRAI level 3 score. Vegetation condition > 22% = E category vegetation Biota Invertebrates MIRAI score Macroinvertebrate condition > 80% = B category Иay Aug Sep ö Dec an Feb Mar Apr Jun ٦Ľ Months Maintenance flows (million cubic Maintenance low 0.068 0.110 0.155 0.163 0.110 0.022 0.023 0.034 0.187 0.141 0.061 0.031 Low Flows sufficient to maintain D9 Middle Berg Low flows flows Kromme River Quantity metres) High flows Maintenance high the river in a D category. D9-R05 G10D High 0.086 0.016 0.000 0.000 0.556 0.156 0.000 0.000 0.000 0.189 0.319 0.156 ≡ flows Bvii3 D Phosphate (PO₄-P) Nutrient levels must be ≤ 0.075 milligrams per litre (50th percentile) Quality Nutrients maintained in the river in an Total inorganic ≤ 1.75 milligrams per litre (50th percentile) mesotrophic condition. nitrogen (TIN)

Table 3: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis D9 Middle Berg

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| IUA | Class | Quaternary Catchment | RU | Resource | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|----------------|-------|-------------------------|--------|------------|--------------------------|------------------|--|---------------------------------------|---|--|--|
| | | Catchment | | Name | Node Name | | | Salts | Electrical conductivity (EC) | Salt concentrations must be maintained in an Ideal category. | ≤ 30 milliSiemens/metre (95th percentile) |
| | | | | | | | | | pH range | pH, temperature, and | $6.5 \le pH \le 8.5$ (5th and 95th percentiles) |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C difference from ambient water temperature |
| | | | | | | | | System variables | Dissolved oxygen | for the maintenance of ecosystem health. | $DO \ge 8$ milligrams per litre (5th percentile) |
| | | | | | | | | | Ammonia | Toxicity levels must not pose a | ≤ 0.073 milligrams per litre (95th percentile) |
| | | | | | | | | Toxins | Atrazine | threat to aquatic ecosystems. | ≤ 0.079 milligrams per litre (95th percentile) |
| | | | | | | | | | Endusulfan | threat to aquatic ecosystems. | ≤ 0.0013 milligrams per litre (95th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for intermediate contact recreation. | ≤ 2500 counts/100ml (95th percentile) |
| | | | | | | | | Geomorphology | GAI score - | Geomorphological condition | > 38% = D/E category |
| | | | | | | | Habitat | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 18% = F category |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 22% = E category |
| | | | | | | | Biota | Invertebrates | MIRAI score | Macroinvertebrate condition | > 78% = B/C category |
| | | | | | | | Quantity | Low flows High flows | Maintenance low flows Maintenance high flows | Flows sufficient to maintain the river in a D category | Maintenance flows (million cubic metres) Mod metres) metres) metres) High Low 0.000 14.246 0.000 5.200 0.000 5.200 0.000 2.648 2.199 2.611 0.000 2.523 0.000 2.342 6b 0.000 2.1152 Apr 0.000 2.535 10.152 Apr 13.45 24.388 13.45 25.280 37.63 25.299 0.000 20.701 0.000 25.299 0.000 25.293 |
| | | | | | | | | | | | |
| D9 Middle Berg | = | G10D | D9-R06 | Berg River | Bvii5 | D | | Nutrients | Phosphate (PO ₄ -P) Total inorganic nitrogen (TIN) | maintained in the river at a | ≤ 0.125 milligrams/litre (50th percentile) ≤ 3.00 milligrams/litre (50th percentile) |
| D9 Mid | | 61 | -60 | Berg | Bvii5 D | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at present state levels. | 95%tile ≤ 55 milliSiemens/metre EC | |
| | | | | | | | Quality | | pH range | pH, temperature, and | $6.5 \le pH \le 8.5$ (5th and 95th percentiles) |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C difference from ambient water temperature |
| | | | | | | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligrams litre (5th percentile) | | | |
| | | | | | | | | Toxins | Ammonia | Toxicity levels must not pose a | ≤ 0.073 milligrams per litre (95th percentile) |
| | | | | | | | | | Atrazine | threat to aquatic ecosystems. | ≤ 0.079 milligrams per litre (95th percentile) |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|------------------------|---|--|--|
| | | | | | | | | | Endosulfan | | ≤ 0.0013 milligrams per litre (95th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for intermediate contact recreation. | 95%tile ≤ 2500 cfu/100ml Escherichia coli |
| | | | | | | | | Geomorphology | D50 | Sand particle size | 0.714 > D50 > 0.251 |
| | | | | | | | | | VEGRAI level 3 score. | Vegetation condition | > 52% = D category |
| | | | | | | | | | Exotic species | | No exotic plant species. |
| | | | | | | | | | Terrestrial woody species | - | No terrestrial woody species. |
| | | | | | | | | | , i | Marginal zone cover abundance | Cover 50-75%. |
| | | | | | | | | | Non-woody indigenous species | | Cover 15-25%. |
| | | | | | | | | | Reeds | | No reeds |
| | | | | | | | | | Exotic species | - | Cover < 5%. |
| | | | | | | | Habitat | Dineview | Terrestrial woody | | Cover < 10%. |
| | | | | | | | Παριται | Riparian vegetation | species Indigenous riparian woody species | Lower zone cover abundance | Cover 50-75%. |
| | | | | | | | | | Non-woody indigenous species | | Cover 15-25%. |
| | | | | | | | | | Reeds | - | No reeds |
| | | | | | | | | | Exotic species | | Cover < 10%. |
| | | | | | | | | | Terrestrial woody species | - | Cover = 15%.</td |
| | | | | | | | | | Indigenous riparian woody species | Upper zone cover abundance | Cover 50-75%. |
| | | | | | | | | | Non-woody indigenous species | | Cover 10-20% |
| | | | | | | | | Fish | FRAI score | Fish condition | > 52% = D category |
| | | | | | | | | | Exotic fish species | Indigenous species richness | No increase in the number of exotic fish present: Cyprinus carpio (FROC = 5), Tilapia sparrmanii, |
| | | | | | | | Biota | | | | Clarias gariepinus, Gambusia affinis |
| | | | | | | | | Invertebrates | MIRAI score | | > 62% = C category |
| | | | | | | | | | SASS5 and ASPT score | SASS scores | SASS5 score >90, ASPT \geq 4.6. |
| | | | | | | | | | Number of families | Diversity of invertebrate community | >/= 18 families, at an abundance of A to C. |

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Quaternary Resource **Biophysical** IUA Class RU TEC Indicator **ROO** Narrative **RQO Numeric** Component Sub-component Catchment Node Name Name May Jul Aug Sep Vot Vov Feb Mar Apr Jun lan Months Maintenance flows (million cubic metres) Maintenance low 1.619 0.398 0.305 0.338 0.618 0.754 0.291 110 .002 1.391 .744 NO. Flows sufficient to maintain Low flows flows Quantity High flows the river in a C category Maintenance high flows 0.638 0.141 0.000 0.000 0.000 0.000 0.000 1.5160.831 0.802 0.831 2.913 High Phosphate (PO₄-P) Nutrient levels must be ≤ 0.075 milligrams/litre (50th percentile) maintained in the river at a Nutrients Total inorganic \leq 1.75 milligrams/litre (50th percentile) mesotrophic or better nitrogen (TIN) condition. Salt concentrations need to be **Berg Tributaries** Electrical conductivity maintained at levels that do Berg River ≤ 55 milliSiemens/metre (95th percentile) Salts (EC) not adversely affect aquatic C5-R07 G10E ecosystems = С Biii4 $6.5 \le pH \le 8.5$ (5th and 95th percentiles) pH range pH, temperature, and Klein I dissolved oxygen are important 2°C difference from ambient water temperature Water temperature System variables Quality ß for the maintenance of Dissolved oxygen ≥ 6 milligrams litre (5th percentile) ecosystem health. Ammonia ≤ 0.073 milligrams per litre (95th percentile) Toxins Toxicity levels must not pose a ≤ 0.079 milligrams per litre (95th percentile) Atrazine threat to aquatic ecosystems. ≤ 0.0013 milligrams per litre (95th percentile) Endusulfan Concentrations of waterborne pathogens should be Escherichia coli \leq 2500 counts/100ml (95th percentile) Pathogens maintained in an Acceptable category for intermediate contact recreation. Habitat Riparian VEGRAI level 3 score. Vegetation condition > 62% = C category vegetation > 58% = C/D category Biota Fish FRAI score Fish condition Feb Mar Apr May Jun Jul Aug Dec an Sep oct No/ Months C5 Berg Tributaries Vier-en-Twintig e flows metres) 2.050 0.563 0.573 0.674 1.128 2.358 2.620 2.470 115 0.731 1.811.631 Maintenance low Low C5-R08 G10G Flows sufficient to maintain Low flows flows = Maintenance f (million cubic m Bi1 B/C Quantity High flows Maintenance high the river in a B/C category flows 0.646 0.217 0.000 0.000 0.000 0.000 2.510 0.000 1.298 3.886 0.748 1.497 High

Table 4: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis C5 Berg Tributaries

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|------------------------|-----------------------------------|---|---|
| | | | | | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.025 milligrams per litre PO4-P |
| | | | | | | | | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at an oligotrophic condition. | ≤ 0.70 milligrams per litre TIN |
| | | | | | | | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained in an Ideal category for aquatic ecosystems | ≤ 30 milliSiemens/metre (95th percentile) |
| | | | | | | | Quality | | pH range | pH, temperature, and | $4.5 \le pH \le 7.0$ (5th and 95th percentiles) |
| | | | | | | | Quality | System variables | Water temperature | dissolved oxygen are important | 2°C difference from ambient water temperature |
| | | | | | | | | System variables | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 8 milligrams per litre (5th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Ideal category for full contact recreation. | ≤ 130 counts/100ml (95th percentile) |
| | | | | | | | Habitat | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 88% = A/B category |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 88% = A/B category |
| | | | | | | | | Invertebrates | MIRAI score | Macroinvertebrate condition | > 82% = B category |

Table 5: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis B4 Lower Berg

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | RQC | Nu | mer | ic | | | | |
|---------------|-------|-------------------------|--------|------------------|--------------------------|-----|-----------|-------------------------|---|---|---|------|-------|-------|-------------------------|------|--------|-------|---------------|-----|
| | | | | | | | | | | | Months t | Nov | Dec | Jan | Mar | Apr | May | un 11 | Aug | Sep |
| B4 Lower Berg | Ξ | G10J | B4-R09 | Berg River | Bvii6 | D | Quantity | Low flows High flows | Maintenance low flows Maintenance high flows | Flows sufficient to maintain the river in a D category | Maintenance flows (million cubic metres) High Low 2.496 26.184 | | | | 0.000 8.272 0.000 7.947 | | | | 12.479 37.184 | |
| | | | | | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≥ ≤ 0.075 milligra | ams | /litr | e (50 |)th p | erce | entile | e) | | |
| | | | | | | | Quality | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at a mesotrophic or better condition. | ≤ 1.75 milligraı | ms/l | itre | (501 | h pe | rcer | ntile) |) | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|------------------|--------------------------------------|--|---|
| | | | | | | | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at levels that do not adversely affect aquatic ecosystems | ≤ 55 milliSiemens/metre (95th percentile) |
| | | | | | | | | | pH range | pH, temperature, and | $6.5 \le pH \le 8.5$ (5th and 95th percentiles) |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C difference from ambient water temperature |
| | | | | | | | | System variables | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligrams litre (5th percentile) |
| | | | | | | | | Toxins | Atrazine | Toxicity levels must not pose a | ≤ 0.079 milligrams per litre (95th percentile) |
| | | | | | | | | TOXITIS | Endusulfan | threat to aquatic ecosystems. | ≤ 0.0013 milligrams per litre (95th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for full contact recreation. | ≤ 1000 counts/100ml (95th percentile) |
| | | | | | | | | Geomorphology | GAI score - | Geomorphological condition | > 68% = B/C category |
| | | | | | | | | | D50 | Sand particle size | 0.576 > D50 > 0.349 |
| | | | | | | | | | VEGRAI level 3 score. | Vegetation condition | > 42% = D category |
| | | | | | | | | | Exotic species | | No exotic plant species. |
| | | | | | | | | | Terrestrial woody | | No terrestrial woody species. |
| | | | | | | | | | species | | No terrestrial woody species. |
| | | | | | | | | | Indigenous riparian | Marginal zone cover | Cover 30-50%. |
| | | | | | | | | | woody species | abundance | |
| | | | | | | | | | Non-woody indigenous species | 5 | Cover 30-50%. |
| | | | | | | | | | Reeds | | Cover 30-50%. |
| | | | | | | | | | Exotic species | | Cover < 5%. |
| | | | | | | | Habitat | Riparian | Terrestrial woody species | | Cover < 10%. |
| | | | | | | | | vegetation | Indigenous riparian woody species | Lower zone cover abundance | Cover 50-75%. |
| | | | | | | | | | Non-woody indigenous species | | Cover 5-10%. |
| | | | | | | | | | Reeds | - | No reeds |
| | | | | | | | | | Exotic species | | Cover < 10%. |
| | | | | | | | | | Terrestrial woody | - | |
| | | | | | | | | | species | | Cover = 15%.</td |
| | | | | | | | | | Indigenous riparian | Upper zone cover abundance | 22.50% |
| | | | | | | | | | woody species | | Cover 30-50%. |
| | | | | | | | | | Non-woody indigenous | 6 | |
| | | | | | | | | | species | | Cover 30-50%. |

| Exotic fish species Indigenous species richness | > 18% = F category No increase in the number of exotic fish present: Cyprinus carpio, Oreochromis mossambicus, Tilapia sparrmanii, Micropterus punctulatus, Clarias gariepinus and Gambusia affinis. > 42% = D category | | | |
|---|---|--|--|--|
| | Cyprinus carpio, Oreochromis mossambicus, Tilapia sparrmanii, Micropterus punctulatus, Clarias gariepinus and Gambusia affinis. | | | |
| | > 42% = D category | | | |
| Biota Invertebrates MIRAI score Macroinvertebrate condition | | | | |
| SASS5 and ASPT score SASS scores | SASS5 score >80, ASPT ≥ 5.0 | | | |
| Number of families Diversity of invertebrate community | >/= 15 families, at an abundance of A to C. | | | |
| | Wouths Sep | | | |
| Quantity Low flows Flows sufficient to maintain High flows Maintenance high the river in a D category | ance itilion Low 17.1 10.1 6.56 5.58 5.53 5.53 7.43 9.88 9.88 9.88 20.4 20.4 23.0 | | | |
| flows | Maintenance flows (million cubic metres) High Low 2.760 17. 0.000 6.5 0.000 5.5 0.000 5.7 0.000 5.7 0.000 5.7 0.000 5.7 0.000 5.4 0.000 5.5 0.000 5.5 0.000 9.8 16.380 15. 6.480 20. 37.175 24. 0.0000 23. 0.0000 23. | | | |
| Phosphate (PO ₄ -P) Nutrient levels must be | ≤ 0.075 milligrams/litre (50th percentile) | | | |
| Nutrients Total inorganic maintained in the river at an nitrogen (TIN) | ≤ 1.75 milligrams/litre (50th percentile) | | | |
| (EC) not adversely affect aquatic | ≤ 55 milliSiemens/metre (95th percentile) | | | |
| Image: Second | $6.5 \le pH \le 8.5$ (5th and 95th percentiles) | | | |
| Water temperature dissolved oxygen are important | 2°C difference from ambient | | | |
| for the maintenance of | ≥ 6 milligrams litre (5th percentile) | | | |
| Toxins Atrazine Toxicity levels must not pose a | ≤ 0.079 milligrams per litre (95th percentile) | | | |
| Endusulfan threat to aquatic ecosystems. | ≤ 0.0013 milligrams per litre (95th percentile) | | | |
| Concentrations of waterborne pathogens should be | | | | |
| Pathogens Escherichia coli maintained in an Acceptable : category for intermediate contact recreation. | e ≤ 2500 counts/100ml (95th percentile) | | | |
| | > 68% = B/C category | | | |
| Habitat | 0.860 > D50 > 0.275 | | | |
| Habitat | > 42% = D category | | | |
| | No exotic plant species. | | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------------------|--------------------------------------|-------------------------------------|---|
| | | | | | | | | Geomorphology Riparian | Terrestrial woody species | abundance | No terrestrial woody species. |
| | | | | | | | | vegetation | Indigenous riparian woody species | - | Cover 30-50% |
| | | | | | | | | | Non-woody indigenous species | - | Cover 50-75%. |
| | | | | | | | | | Reeds | - | Cover 15-25%. |
| | | | | | | | | Fish | FRAI score | Fish condition | 85% (B category) |
| | | | | | | | | | Exotic fish species | Indigenous species richness | No increase in the number of exotic fish present: |
| | | | | | | | | Invertebrates | | | Cyprinus carpio, Oreochromis mossambicus, |
| | | | | | | | | Fish | | | Tilapia sparrmanii, Micropterus punctulatus, |
| | | | | | | | | | | | Clarias gariepinus and Gambusia affinis. |
| | | | | | | | | | MIRAI score | Macroinvertebrate condition | 81.4% (B/C category) |
| | | | | | | | | | SASS5 and ASPT score | SASS scores | SASS5 score >85, ASPT ≥ 4.2. |
| | | | | | | | | | Number of families | Diversity of invertebrate community | >/= 19 families, at an abundance of A to C. |

Table 6: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis D10 Diep

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | R | QO I | Num | neri | ic | | | | |
|------|-------|-------------------------|---------|------------------|--------------------------|-----|-----------|-------------------------|---|--|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | | | | | | | Months | Oct | Νον | Dec | Feb | Mar | Apr | May | unr | Aug | Sep |
| | | | | | | | Quantity | Low flows High flows | Maintenance low flows Maintenance high flows | Flows sufficient to maintain the river in a D category | nce flows cubic es) Low | 0.079 | 0.053 | 0.029 | 0.017 | 0.015 | 0.021 | 0.043 | 0.090 | 0.157 | 0.106 |
| | | | _ | r | | | | | nows | | Maintenance (million cu metres) High L | 0.026 | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.116 | 0.294 | 0.473 | 0.120 |
| Diep | = | 10 | R1 | River | Bv1 | D | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.075 milli | grai | ms/l | itre | (50t | h p | erce | entil | e) | | |
| D10 | = | 62 | D10-R11 | Diep | DVI | D | | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at a mesotrophic or better condition. | ≤ 1.75 millig | ram | s/lit | re (! | 50th | i pei | rcer | ntile |) | | |
| | | | | | | | Quality | Salts | Electrical conductivity (EC) | Diep River is naturally saline and should be maintained in its current status. | ≤ 450 milliSi | eme | ens/ | met | re (9 | 95th | n pe | rcen | tile) | | |
| | | | | | | | | | pH range | pH, temperature, and | 6.5 ≥ pH ≤ 8. | 5 (5 | ith a | nd 9 | 95th | pei | rcer | ntile | 5) | | |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C differen | ce fi | rom | aml | bien | t wa | ater | tem | pera | ature | 5 |
| | | | | | | | | | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligram | ns li | tre (| 5th | perc | cent | tile) | | | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|----------|-------|-------------------------|---------|------------------|--------------------------|-----|-----------|-------------------------|--|--|--|
| | | | | | | | | Toxins | Atrazine | Toxicity levels must not pose a | ≤ 0.079 milligrams per litre (95th percentile) |
| | | | | | | | | | Endusulfan | threat to aquatic ecosystems. | ≤ 0.0013 milligrams per litre (95th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | DescriptionSolutionSol | ≤ 2500 counts/100ml (95th percentile) |
| | | | | | | | | | | | Wouths Nov Oct April And April And Add Add Add Add Add Add Add Sep |
| | | | | | | | Quantity | Low flows High flows | Maintenance low flows Maintenance high | w Flows sufficient to maintain the river in a D category Months V< | nance nillion Low 0.176 0.118 0.062 0.042 0.037 0.037 0.033 0.033 0.033 0.033 0.033 0.033 0.033 0.033 0.033 0.0230 0.2206 |
| | | | | | | | | | flows | | Mainte flows (r cubic m High 0.077 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.235 0.146 0.146 0.293 |
| | | | | | | | | | Phosphate (PO ₄ -P) | River nutrient levels must be | ≤ 0.125 milligrams/litre (50th percentile) |
| | | | | | | | | Nutrients | Total inorganic nitrogen (TIN) | | < 2.5 milligrams/litre (50th percentile) |
| | | | | | | | | Salts | Electrical conductivity (EC) | and should be maintained in its | s < 350 milliSiemens/metre (95th percentile) |
| a | | | 5 | er | | | | | pH range | pH, temperature, and | $6.5 \le pH \le 8.5$ (5th and 95th percentiles) |
| Die | Ξ | G21D | -R1 | Riv | Biv6 | D | | System variables | Water temperature | dissolved oxygen are important | 2°C difference from ambient water temperature |
| D10 Diep | _ | 63 | D10-R12 | Diep River | Divo | | Quality | System variables | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligrams litre (5th percentile) |
| | | | | | | | | Toxins | Atrazine | | ≤ 0.079 milligrams per litre (95th percentile) |
| | | | | | | | | | Endusulfan | timeat to aquatic ecosystems. | ≤ 0.0013 milligrams per litre (95th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for intermediate contact recreation. | ≤ 2500 counts/100ml (95th percentile) |
| | | | | | | | | Geomorphology | GAI score | Geomorphological condition | > 22% = E category |
| | | | | | | | Habitat | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 18% = F category |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 22% = E category |
| | | | | | | | biota | Invertebrates | MIRAI score | Macroinvertebrate condition | > 22% = E category |

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Table 7: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis E11 Peninsula

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | I | RQO | Nu | mer | ic | | | | |
|---------------|-------|-------------------------|---------|------------------|--------------------------|-----|-----------|-------------------------|--|--|--|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| | | | | | | | | | Maintenance low | | Months | Oct | Nov | Dec | Jan | Mar | Apr | Мау | unr | Inc | Sep |
| | | | | | | | Quantity | Low flows High flows | flows Maintenance high flows | Flows sufficient to maintain the river in a D category | nance nillion letres) Low | 0.132 | 0.071 | 0.038 | 0.029 | 0.025 | 0.037 | 0.070 | 0.142 | 0.252 | 0.204 |
| | | | | | | | | | nows | | Maintenance flows (million cubic metres) High Low | 0.037 | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.121 | 0.302 | 0.094 | 0.188 |
| | | | | | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.125 mill | igra | ams | per | litre | e (50 |)th (| perc | enti | e) | |
| | | | | | | | | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river in a eutrophic or better condition. | ≤ 2.50 millig | grar | ns I | ber l | tre | (50t | h p | erce | ntile |) | |
| E11 Peninsula | = | G22B | E11-R13 | Hout Bay | Bviii6 | D | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at levels that do not adversely affect aquatic ecosystems | ≤ 55 milliSie | me | ns/ | meti | e (9 | 5th | per | cent | ile): | | |
| E11 | | | | - | | | Quality | | pH range | pH, temperature, and | 6.5 ≥ pH ≤ 8. | .5 (| (5th | and | 95 | th pe | erce | entil | es) | | |
| | | | | | | | Quanty | System variables | Water temperature | dissolved oxygen are important | 2°C differen | ce f | fron | n am | bie | nt w | ate | r ter | npei | atu | e |
| | | | | | | | | System variables | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligran | ns p | ber | itre | (5tł | i per | rcer | ntile) | | | |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for full contact recreation. | ≤ 4000 coun | its/: | 100 | ml (| 95tł | ı per | rcer | ntile) | | | |
| | | | | | | | Habitat | Riparian | VEGRAI level 3 score. | Vegetation condition | > 22% = E ca | iteg | gory | | | | | | | | |
| | | | | | | | | vegetation | | | | | | | | | | | | | |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 18% = E/F | cat | ego | ry | | | | | | | |
| | | | | | | | ыота | Invertebrates | MIRAI score | Macroinvertebrate condition | > 42% = D ca | ateg | gory | / | | | | | | | |
| | | | | L | | | | | | | Months | Oct | Nov | Dec | Jan | Mar | Apr | May | un[| Inr | Sep |
| Peninsula | = | G22A | E11-R14 | Silvermine River | Bvii20 | с | Quantity | Low flows High flows | Maintenance low flows Maintenance high | Flows sufficient to maintain the river in a C category | nce flows cubic es) Low | 0.167 | 0.105 | 0.053 | 0.035 | 0.027 | 0.037 | 0.069 | 0.138 | 0.287 | 0.233 |
| E11 | | | ш | Silver | | | | | flows | | Maintenance flows (million cubic metres) High Low | 0.017 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.036 | 0.088 | 0.191 | 0.053 |
| | | | | | | | Quality | Nutrients | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.075 milli | gra | ms | litre | (50 |)th p | erc | enti | e) | | |

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|------------------------|-----------------------------------|--|---|
| | | | | | | | | | Total inorganic nitrogen (TIN) | maintained in the river at a mesotrophic or better condition. | ≤ 1.75 milligrams/litre (50th percentile) |
| | | | | | | | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at levels that do not adversely affect aquatic ecosystems | ≤ 350 milliSiemens/metre (95th percentile) |
| | | | | | | | | | pH range | pH, temperature, and | $6.5 \le pH \le 8.5$ (5th and 95th percentiles) |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C difference from ambient water temperature |
| | | | | | | | | System variables | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligrams litre (5th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Ideal category for intermediate contact recreation. In the long term the aim should be to improve the river to an Acceptable category for full contact recreation. | ≤ 1000 counts/100ml (95th percentile) |
| | | | | | | | Habitat | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 62% = C category |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 82% = B category |
| | | | | | | | | Invertebrates | MIRAI score | Macroinvertebrate condition | > 62% = C category |

Table 8: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis E12 Cape Flats

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | R | QO | Num | neric | | | | | |
|----------|-------|-------------------------|-------|------------------|--------------------------|-----|-----------|-------------------------|--|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | | | | | | | Months | Oct | Nov | Dec | Feb | Mar | Apr | May | Inf | Aug | Sep |
| e Flats | _ | 2D | 2-R15 | s River | | | Quantity | Low flows High flows | Maintenance low flows Maintenance high | Flows sufficient to maintain the river in a D category | ice flows cubic es) Low | 0.038 | 0.024 | 0.014 | 0.009 | 600.0 | | 0.019 | | 0.066 | 0.054 |
| E12 Cape | ≡ | 622 | E12- | Keysers | Bvii7 | D | | | flows | | Maintenance (million cu metres) High I | 0.012 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.027 | 0.139 | 0.026 | 0.051 |
| | | | | | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.125 milli | gra | ms/ | itre | (50t | h pe | rce | ntile |) | | |
| | | | | | | | Quality | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at a eutrophic or better condition. | ≤ 3.0 milligra | ams | /litr | e (5(|)th p | serce | enti | le) | | | |

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|------------------------|---------------------------------|--|---|
| | | | | | | | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at present day levels. | ≤ 85 milliSiemens/metre (95th percentile) |
| | | | | | | | | | pH range | pH, temperature, and | $6.5 \le pH \le 8.5$ (5th and 95th percentiles) |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C difference from ambient water temperature |
| | | | | | | | | System variables | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligrams litre (5th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in a Tolerable category for intermediate contact recreation. In the long term the aim should be to improve the river to an Acceptable, and then Ideal category for intermediate contact recreation. | ≤ 4000 counts/100ml (95th percentile) |
| | | | | | | | Habitat | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 38% = D/E category |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 62% = C category |

Table 9: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis D6 Eerste

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | I | RQC | Nu | mer | ric | | | | |
|----------|-------|-------------------------|--------|------------------|--------------------------|-----|-----------|-------------------------|---|--|--|-------|--------|----------|-------|-------|--------|-------|-------|-------|
| | | | | | | | | | | | Months C | Nov | Dec | Jan - | Feb | Apr | May | un l | ang | Sep |
| | | | | River | | | Quantity | Low flows High flows | Maintenance low flows Maintenance high flows | Flows sufficient to maintain the river in a C category | nce flows n cubic res) Low 0.639 | 0.543 | 0.349 | 0.200 | 0.142 | 0.186 | 0.335 | 0.522 | 0.714 | 0.693 |
| 6 Eerste | ≡ | G22F | D6-R16 | Jonkershoek Riv | Biii6 | С | | | nows | | Maintenance (million cul metres) High L | | 0.000 | 0.000 | 0.000 | 0.000 | 0.454 | 74 | 0.206 | 0.412 |
| D6 | | | | ıkeı | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.075 milligra | ams | /litre | e (50 |)th p | perc | enti | le) | | |
| | | | | Jor | | | Quality | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at a mesotrophic or better condition. | ≤ 1.75 milligrar | ns/l | itre | (50t | h pe | erce | entile | e) | | |
| | | | | | | | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at present day levels. | ≤ 55 milliSieme | ens/ | met | re (9 | 95th | pei | rcen | tile) | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | I | RQC |) Nu | ıme | eric | | | | | |
|-----------|--------|-------------------------|----------------|------------------|--------------------------|-------|---------------|-----------------------------------|---|--|--|--------|-------|--------|-------|-------|--------|-------|-------|-------|-------|
| | | | | | | | | | pH range | pH, temperature, and | 6.5 ≤ pH ≤ 8.5 | (5th | and | 95 | th p | oerc | ent | iles) | | | _ |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C difference | fron | n ar | nbie | ent | wat | ter t | emp | bera | ture | : |
| | | | | | | | | System variables | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligrams | litre | (5t | h pe | rce | ntil | le) | | | | |
| | | | | | | | | | Ammonia | Tovisity loyals must not nose a | ≤ 0.073 milligr | ams | per | litr | e (9 | 5th | n per | cen | tile) |) | |
| | | | | | | | | Toxins | Atrazine | Toxicity levels must not pose a threat to aquatic ecosystems. | ≤ 0.079 milligr | ams | per | litr | e (9 | 5th | n per | cen | tile) |) | |
| | | | | | | | | | Endusulfan | threat to aquatic ecosystems. | ≤ 0.0013 millig | ram | s pe | er lit | re (| 95t | th pe | erce | ntile | e) | |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for intermediate contact recreation. In the long term the aim should be to improve the river to an Ideal category for intermediate contact recreation. | ≤ 2500 counts/ | 100r | nl (! | 95th | per | rcei | ntile) |) | | | |
| | | | | | | | Habitat | Geomorphology | GAI score | Geomorphological condition | > 62% = C cate | egor | v | | | | | | | | _ |
| | | | | | | | | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 62% = C cate | - | | | | | | | | | |
| | | | | | | Biota | Fish | FRAI score | Fish condition | > 42% = D cate | gory | / | | | | | | | | | |
| | | | | | | Diota | Invertebrates | MIRAI score | Macroinvertebrate condition | > 62% = C cate | egor | y | | | | | | | | | |
| | | | | | | | | Low flows | Maintenance low flows | Flows sufficient to maintain | 5 | 56 Nov | | | | _ | | | | | _ |
| | | | | | | | Quantity | High flows | Maintenance high flows | the river in a D category | Maintenance flows (million cubic metres) High Low | 0.156 | 0.135 | 0.091 | 0.064 | 0.054 | 0.058 | 0.111 | 0.133 | 0.153 | 0.163 |
| | | | | L. | | | | | | | Maintenance flows (million cubic metres) High Low | 0.066 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.182 | 0.100 | 0.291 | 0.100 |
| ste | | | ~ | live | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.125 milligr | ams, | /litr | e (5 | 0th | ре | rcen | tile |) | | |
| D6 Eerste | 8226 ≡ | D6-R17 | Klippies River | Biv8 | D | | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at a eutrophic or better condition. | ≤ 3.0 milligram | ns/lit | re (| 50tl | ו pe | erce | entil | e) | | | | |
| | | | | Kliŗ | | | Quality | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at present day levels. | ≤ 55 milliSieme | ens/ | met | re (| 95t | h p | erce | ntile | e) | | |
| | | | | | | | Quality | | pH range | pH, temperature, and | 6.5 ≤ pH ≤ 8.5 | (5th | and | 95 | th p | oerc | ent | iles) | | | |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C difference | fron | n ar | nbie | ent | wat | ter t | emp | oera | ture | : |
| | | | | | | | | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligrams | | · | · | | | | | | | | |
| | | | | | | | | Toxins | Ammonia | Toxicity levels must not pose a | ≤ 0.073 milligr | ams | per | litr | e (9 | 5th | ı per | cen | tile) |) | |
| | | | | | | | | I UXIIIS | Atrazine | threat to aquatic ecosystems. | ≤ 0.079 milligr | ams | per | litr | e (9 | 5th | n per | cen | tile) |) | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|------------------------|-----------------------|--|---|
| | | | | | | | | | Endusulfan | | ≤ 0.0013 milligrams per litre (95th percentile) |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in a Tolerable category for intermediate contact recreation. In the long term the aim should be to improve the river to an Acceptable, and then Ideal category for intermediate contact recreation. | ≤ 4000 counts/100ml (95th percentile) |
| | | | | | | | Habitat | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 22% = E category |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 18% = D/E category |
| | | | | | | | | Invertebrates | MIRAI score | Macroinvertebrate condition | > 62% = C category |

Table 10: Resource Quality Objectives for RIVERS in priority Resource Units in the Integrated Unit of Analysis D7 Sir Lowrys

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | | RQC | Nur | neri | ic | | | | |
|----------------|-------|-------------------------|--------|------------------|--------------------------|-----|-----------|-------------------------|------------------------------------|--|--|---------------|-------|--------|------------|-------|-------|-------|-------|-------|-------|
| | | | | | | | | | Maintenance low | | Months | Oct | Nov | Dec | Jan Fab | Mar | Apr | Мау | unf | Jul | Sep |
| | | | | | | | Quantity | Low flows High flows | flows Maintenance high flows | Flows sufficient to maintain the river in a D category | nance nillion etres) | Low 0.523 | 0.448 | 0.277 | 0.151 | 0.100 | | 0.254 | 0.410 | 0.520 | 0.568 |
| | | | | | | | | | nows | | Maintenance flows (million cubic metres) | High 0.355 | 0.083 | 0.000 | 0.000 | 0.000 | 0.000 | 0.563 | 1.007 | 1.463 | 0.593 |
| Ž | | | ~ | River | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.075 m | illigra | ims, | /litre | e (50 | th p | erc | entil | e) | | |
| D7 Sir Lowry's | = | G22J | D7-R18 | Lourens R | Bvii21 | D | | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at a mesotrophic or better condition. | ≤ 1.75 mil | ligran | ns/l | itre | (50tl | ו pe | erce | ntile |) | | |
| | | | | _ | | | Quality | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at present day levels. | ≤ 55 millis | Sieme | ns/ | met | re (9 | 5th | per | cent | ile) | | |
| | | | | | | | | | pH range | pH, temperature, and | 6.5 ≤ pH ≤ | š 8.5 (| 5th | and | 95tł | ו pe | rce | ntile | s) | | |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C differ | ence | fron | n an | nbier | nt w | atei | r ter | npe | ratu | ire |
| | | | | | | | | | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligr | ams l | itre | (5tł | ı per | cen | tile) |) | | | |
| | | = $\overrightarrow{2}$ | | | | | | Toxins | Ammonia | Toxicity levels must not pose a | ≤ 0.073 m | illigra | ms | per | litre | (951 | th p | erce | entil | e) | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | I | RQO | Nu | mer | ic | | | | |
|---------------|-------|-------------------------|--------|------------------------|--------------------------|-----|-----------|-------------------------|------------------------------------|--|---|---|------|-------|-------|-------|--------|-------|-------|
| | | | | | | | | | Atrazine | threat to aquatic ecosystems. | ≤ 0.079 milligrams | per li | itre | (95 | th p | perc | entile | e) | |
| | | | | | | | | | Endosulfan | | ≤ 0.0013 milligram | s per | litr | e (9 | 5th | per | centi | ile) | |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for intermediate contact recreation. In the long term the aim should be to improve the river to an Ideal category for intermediate contact recreation. | ≤ 2500 counts/100 | ml (9 | 95th | ı pei | rcei | ntile |) | | |
| | | | | | | | Habitat | Geomorphology | GAI score | Geomorphological condition | > 42% = D category | | | | | | | | |
| | | | | | | | | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 42% = D category | | | | | | | | |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 22 % = E category | <u>/ </u> | | | | | | | |
| | | | | | | | Diota | Invertebrates | MIRAI score | Macroinvertebrate condition | > 42% = D category | | | | | | | | |
| | | | | | | | | | Maintenance low | | Months O | | | | | | Jun - | _ | 5 Sep |
| | | | | | | | Quantity | Low flows High flows | flows Maintenance high flows | Flows sufficient to maintain the river in a C category | intenance flows (million cubic metres) digh Low 0.380 0.959 | 0.599 | 0.50 | 0.18(| 0.25 | 0.459 | 0.755 | 0.984 | 1.145 |
| | | | | Ŀ | | | | | | | Maintenance flows (million cubic metres) High Low 0.380 0.959 | 0.000 | 0000 | 0000 | 0.000 | 0.420 | 0.787 | 117.1 | 0.525 |
| Ś | | | | Riv | | | | | Phosphate (PO ₄ -P) | Nutrient levels must be | ≤ 0.075 milligrams, | litre | (50 | th p | bero | enti | le) | | |
| ' Sir Lowry's | = | G22J | D7-R19 | Sir Lowry's Pass River | Bviii9 | с | | Nutrients | Total inorganic nitrogen (TIN) | maintained in the river at a mesotrophic or better condition. | ≤ 1.75 milligrams/l | tre (! | 50t | h pe | erce | ntile | e) | | |
| D7 | | | | Sir Lov | | | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at present day levels. | ≤ 55 milliSiemens/ | netre | e (9 | 5th | pe | rcen | tile) | | |
| | | | | | | | Quality | | pH range | pH, temperature, and | 6.5 ≤ pH ≤ 8.5 (5th | and § | 95t | h pe | erce | ntile | es) | | |
| | | | | | | | | System variables | Water temperature | dissolved oxygen are important | 2°C difference from | ı aml | bie | nt w | ate | r ter | nper | atu | re |
| | | | | | | | | | Dissolved oxygen | for the maintenance of ecosystem health. | ≥ 6 milligrams litre | · | · . | | | · | | | |
| | | | Δ | | | | | | Ammonia | - Lovicity levels must not nose a | ≤ 0.073 milligrams | | | | | | | | |
| | | | | | | | | Toxins | Atrazine | threat to aquatic ecosystems | ≤ 0.079 milligrams | • | | · · | | | | | |
| | | | | | | | | | Endosulfan | | ≤ 0.0013 milligram | s per | litr | e (9 | 5th | per | centi | ile) | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | RQ | 0 N | lum | nerio | с | | | | |
|----------------|-------|-------------------------|--------|------------------|--------------------------|-----|-----------|-------------------------|--|--|------------------------------|------------|-------|------|-------|-------|------|-------|------|-------|-------|
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for intermediate contact recreation. In the long term the aim should be to improve the river to an Ideal category for intermediate contact recreation. | ≤ 2500 count | s/10 | Dml | (95 | ith I | pero | cent | ile) | | | |
| | | | | | | | Habitat | Riparian vegetation | VEGRAI level 3 score. | Vegetation condition | > 42% = D ca | tegor | y | | | | | | | | |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 42% = D ca | tegor | Ņ | | | | | | | | |
| | | | | | | | DIOLA | Invertebrates | MIRAI score | Macroinvertebrate condition | > 62% = C cat | egor | y | | | | | | | | |
| | | | | | | | | | Maintenance low | | Months | Oct Nov | Dec | Jan | Feb | Mar | Apr | May | Inf | Aug | Sep |
| | | | | | | | Quantity | Low flows High flows | flows Maintenance high flows | Flows sufficient to maintain the river in a B/C category | net mi | 0.427 | - | - | | | | 0.247 | | 0 | 0.502 |
| | | | | | | | | | Description (DO D) | Nutrient levels must be | High High High High | 0.000 | | | | 0.000 | | 0.077 | | 0.307 | 0.077 |
| | | | | - | | | | Nutrients | Phosphate (PO ₄ -P) Total inorganic nitrogen (TIN) | maintained in the river at a | ≤ 0.70 milligr | | | - | | | | |) | | |
| D7 Sir Lowry's | = | G40A | D7-R20 | Steenbras River | Bvii22 | B/C | | Salts | Electrical conductivity (EC) | Salt concentrations need to be maintained at present day levels. | ≤ 55 milliSien | nens, | /me | tre | (95 | ith p | oerc | enti | e) | | |
| D7 | | | | Stee | | | | | pH range | | 5.0 ≤ pH ≤ 7.5 | | | | | | | | - | | |
| | | G4 | | | | | Quality | System variables | Water temperature Dissolved oxygen | dissolved oxygen are important for the maintenance of ecosystem health. | ≥ 6 milligram | | | | | | | tem | pera | ture | |
| | | | | | | | | Taria | Iron | Toxicity levels must not pose a | ≤ 0.1 milligra | ms p | er li | tre | (95 | th p | berc | entil | e) | | |
| | | | | | | | | Toxins | Manganese | threat to aquatic ecosystems. | ≤ 0.18 milligr | ams | per | litr | e (9 | 5th | per | cent | ile) | | |
| | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for full contact recreation. | ≤ 165 counts | /100 | ml (| 95t | h pe | erce | entil | e) | - | | | |
| | | | | | | | Habitat | Geomorphology | GAI score | Geomorphological condition | > 82% = B cat | egor | у | | | | | | | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|-----------------------|-----------------------------|----------------------|
| | | | | | | | | Riparian | VEGRAI level 3 score. | Vegetation condition | > 78% = B/C category |
| | | | | | | | | vegetation | | | |
| | | | | | | | Biota | Fish | FRAI score | Fish condition | > 52% = D category |
| | | | | | | | | Invertebrates | MIRAI score | Macroinvertebrate condition | > 92% = A category |

Table 11: Resource Quality Objectives for ESTUARIES in priority Resource Units in the Integrated Unit of Analysis A1 Berg Estuary

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | | R | | lum | eric | | | | | |
|--------------|-------|--|--------------|------------------|--------------------------|----------|-----------|---|---|---|--|------------------------|----------------|----------------|--------------|----------------|----------------|--------------|-----------------------------|----------|-------|--------------|
| | | | | | | | | | | River inflow should never drop below 0.6 m ³ .s ⁻¹ and should not | t | oct | Nov | Dec | Feb | Mar | Apr | May | unr Inr | Aug | Sep | Annual |
| | | | | | | | Quantity | Surface flow | Flow | below 1 m ³ .s ⁻¹ for longer than 4 months; Flood frequency Should not increase/decrease by more than 10% from 2004 baseline conditions | MMR/MAR (% Natural) | 31.21 (46%) | | 3.92 (25%) | | | | | 04.25 (42%) 123.35 (61%) | | | 486.86 (52%) |
| | | | | | | | | Nutrients | DIN | Inorganic nutrient concentrations not to exceed | Estuary (low <100 μg/l in Zones C and Estuary (hig <60 μg/l in 2 | n Zoi I D ;h flo | nes A | A and > 5 m | I B, D |)IN < | 80 µ | g/l ; | DRP | <30 J | ug/l | in |
| Berg Estuary | = | l-E01 | oot) Estuary | Bxi1 | с | | | DIP | TPCs for macrophytes and microalgae | River inflow µg/l River inflow µg/l | | | | | | | | | | |) | |
| A1 Ber | | G10M A1-E01 Berg (Groot) Estuary | | | Quality | Salinity | Salinity | Salinity distribution not to exceed TPCs for fish, invertebrates, macrophytes and microalgae | Salinity <20 from the mo the mouth; Groundwate <3500 mg/l | outł Sali | n; Sal nity | linity of Sa | <1 p linity | opt a / eve | bove rywl | e 40 k nere | tm up in es | ostre uar | am (/ <35 | of 5; | | |
| | | | | | | | | | Temperature | c | "River inflow | w: 7 | < pł | 1 < 8. | .5 | | | | | | | |
| | | | | | | | | System variables | pН | System variables not to exceed TPCs for biota | Estuary: 7 < | рΗ | < 8.5 | 5 " | | | | | | | | |
| | | | | | | | | | Dissolved oxygen | | "River inflo | | | 0, | /1 | | | | | | | |
| | | | | | | | | | Secchi depth | | Estuary DO | | | | | | | | · · · | | | |
| | | | | | | | | | Enterococci | Concentrations of waterborne | Zones A and | 3 B < | <1.0 | m du | ring | low | flow | (< 1 | n °.s⁻ |) | | _ |
| | | | | | | | | Pathogens | Escherichia coli | Concentrations of waterborne pathogens should be maintained in an Acceptable category for contact recreation | l≤185 Enterc | 0000 | :cı/1(| UU m | 1) (90 | Jth p | erce | ntile | , haz | en sy | /ster | n) |
| | | | | | | | Habitat | Hydrodynamics | Mouth state | Habitat health adequate for | Permanentl | y op | ben | | | | | | | | | |

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| JA Cla | ass | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|--------|-----|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--|--|---|
| | | | | | | | | Sediments | Tidal variation Sediment characteristics, Channel shape/size | microalgae, macrophytes, invertebrates, fish, birds and recreational use | <10% change from present state Bathymetry and sediment MdØ change <10% from baseline |
| | | | | | | | | Microalgae | Biomass and community composition of phytoplankton and benthic microalgae community | | Blue-green algae <10% of phytoplankton cell counts, Benthic microphytobenthic < 40 mg/m ² chlorophyll a, The frequency of dinoflagellates < 5% of the total phytoplankton counts |
| | | | | | | | Biota | Macrophytes | Extent, distribution and richness of macrophytes | Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use | Maintain the present distribution (2003-2005) and abundance of the different plant community types and estuarine habitats (intertidal mudflats with <i>Zostera</i> <i>capensis</i> 206 ha, intertidal salt marsh 499 ha, open pan 1159 ha, halophytic floodplain 1521 ha, xeric floodplain 919.1 ha, reeds and sedges 586.6 ha and sedge pan 292.5 ha), Prevent an increase in mats of macroalgae in the lower intertidal reaches, Reduce the area covered by water hyacinth (<i>Eicchornia crassipes</i>) in the upper reaches by 50% compared to the present state (2003-2005), Prevent an increase in size of the open pan dry areas (1159 ha in 2003-2005), Prevent a decrease in size of the sedge pan areas (293 ha in 2003-2005). <i>Juncus maritimus</i> , and waterblommetjies <i>Aponogeton distachyos</i> are present, Prevent the spread of invasive aliens in the riparian zone (e.g. <i>Acacia mearnsii</i> and <i>Eucalyptus camaldulensis</i>), Maintain intact reed and sedge stands along the banks of the estuary by ensuring that salinity is not greater than 20 ppt for 3 months at 20 km from the month during summer, Prevent an increase in bare ground in the halophytic and xeric floodplain habitats by maintaining the present-day flooding patterns |
| | | | | | | | | Invertebrates | Macrofauna community composition, abundance and richness | Abundance and community composition of Invertebrates suitable for fish, birds | Retain present species richness, distribution of species and mix (low species abundance, high dominance) in Zones A to the middle reaches of Zone C. One or two species will always be present at high densities compared to others (e.g. <i>Pseudodiaptomus hessei, Grandidierella sp.</i>) in these Zones (A to C), Indicator species such as <i>Capitella capitata</i> , should not dominate benthic species at any site, <i>Callianassa kraussi</i> and <i>Upogebia africana</i> distribution patterns remain similar to present state. |

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--|--|--|
| | | | | | | | | Fish | Fish community composition, abundance and richness | Abundance and community composition of fish community suitable for birds | Retain the full complement of estuarine resident (7 species) and estuary associated marine (5 species) present in the estuary with population sizes sufficient to ensure their persistence in perpetuity, Ensure that exotic freshwater species do not increase to levels where they can exclude any more indigenous species through predation or competitive interactions, Maintain recruitment of adult and juvenile fish at present levels. This requires maintaining sufficient flow for freshwater plume (temperature, salinity and olfactory gradient) entering the sea. This implies that there should be a significant number of 0 -1-year-old fish and no missing year classes. |
| | | | | | | | | | Avifauna community composition, abundance and richness | Health avifauna community contributing to conservation of avifauna species in SA | Retain at least 90% of the baseline species richness, abundance and diversity of the bird community determined using regression slope based on a 3-year running average |

Table 12: Resource Quality Objectives for ESTUARIES in priority Resource Units in the Integrated Unit of Analysis A2 Langebaan

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----------|-------|-------------------------|--------|------------------|--------------------------|-----|-----------|------------------|------------------|---|--|
| | | | | | | | | Nutrients | NO ₃ | Inorganic nutrient concentrations not to exceed TPCs for macrophytes and microalgae | NO₃<1.3 mg.l ⁻¹ |
| Langebaan | | Z | 02 | aan | | | | Salinity | Salinity | Salinity distribution not to exceed TPCs for fish, invertebrates, macrophytes and microalgae | Salinity at the head of the lagoon <40; Rest of the lagoon 34 < Salinity < 36 |
| | = | G10M | A2-E02 | Langebaan | Bxi3 | A | Quality | System variables | Dissolved oxygen | , | >4 mg.l ⁻¹ |
| A2 | | | | | | | | | Secchi depth | TPCs for biota | Sechii depth >1 m |
| | | | | | | | | | Enterococci | Concentrations of waterborne | <185 Enterococci/100 ml) (90th percentile, hazen system) |
| | | | | | | | | Pathogens | Escherichia coli | pathogens should be maintained in an Acceptable category for intermediate contact recreation | ≤500 E. coli/100 ml (90th percentile, hazen system) |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--|--|--|
| | | | | | | | | Hydrodynamics | Tidal amplitude | Habitat health adequate for | Tidal amplitude should not change more than 10% from present state (2017) |
| | | | | | | | Habitat | Sediments | | microalgae, macrophytes, invertebrates, fish, birds and recreational use | Bathymetry and sediment MdØ change <10% from baseline |
| | | | | | | | | Microalgae | community | | Maintain low phytoplankton biomass (chlorophyll- a < 20 μg/ℓ) and a diversity of phytoplankton groups. |
| | | | | | | | | Macrophytes | Extent, distribution and richness of macrophytes | Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use | Maintain the distribution and area cover of macrophyte habitats particularly the salt marsh and seagrass. Maintain the large groundwater fed rush habitat. |
| | | | | | | | Biota | Invertebrates | community | suitable for fish, birds | In terms of Invertebrates Langebaan lagoon is currently in an A category. The invertebrate communities are in good health with species richness, abundances and composition scoring highly. |
| | | | | | | | | Fish | composition | Abundance and community composition of fish community suitable for birds | The fish community should include healthy populations of exploited fish species, specifically the harders, white stumpnose, blacktail, elf and smooth hound shark juveniles should all be present in beach seine net sampling surveys (at least 10 hauls in 3 different sites) of the nearshore areas. Adults of these species should remain the main components in the catches of line and net fisheries in the lagoon, and catch rates should remain stable or increase. |
| | | | | | | | | Birds | composition, | Health avifauna community | Retain at least 90% of the baseline species richness, abundance and diversity of the bird community determined using regression slope based on a 3-year running average. |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | | R | QOI | Num | eric | | | | |
|----------|-------|-------------------------|---------|------------------|--------------------------|---------|-----------|------------------|--|--|-------------------------------|-------|-------|-------------------|---------------|-------|---------|--------------|-------------------|--------|------|
| | | | | | | | | | | Freshwater inflow adequate to | | Oct | Nov | Dec | Jan | Mar | Apr | May | Pr | Aug | Sep |
| | | | | | | | Quantity | Surface flow | Flow | maintain water quality and habitat suitable for flora and | | 80% | 80 % | 80% | % CC % UU1 | 100 % | 80% | 80 % 80 % | 80% | 80% | 80% |
| | | | | | | | | | | | River inflow: | <8 | 00 µ | g.l ⁻¹ | | | | | | | |
| | | | | | | | | Nutrients | DIN | Inorganic nutrient concentrations not to exceed TPCs for macrophytes and microalgae | Lower estuar | -y (I | Miln | erto | n la | goon |): <10 | 00 µį | g.l ⁻¹ | | |
| | | | | | | | | | DIP | | River inflow: | | | | | | | • | 1 | | |
| | | | de | | | Quality | Salinity | Salinity | Salinity distribution not to | Lower estuar Average salir maximum = 3 | nity | | | | | | | | on) | = 20 | |
| D10 Diep | ≡ | III G21F D10-E03 | D10-E03 | Rietvlei/Diep | Bviii5 | D | | System variables | Dissolved oxygen | System variables (temperature, pH, dissolved oxygen, suspended solids and turbidity) not to exceed TPCs for biota | >4 mg.l ⁻¹ | | | | | | | | | | |
| | | | | | | | | | Enterococci | Concentrations of waterborne | ≤185 Enteroo | coc | ci/1(|)0 m | I) (9 | 0th p | oerce | ntile, | haze | n sy | stem |
| | | | | | | | | Pathogens | Escherichia coli | pathogens should be | ≤500 E. coli/: | 100 |) ml | (90tł | ו pe | rcen | tile, h | azen | syste | m) | |
| | | | | | | | | Hydrodynamics | Mouth state Tidal variation | Habitat health adequate for | Permanently <10% change | | | roco | nt c | tata | | | | | |
| | | | | | | | Habitat | Sediments | Sediment characteristics, Channel shape/size | recreational use | Bathymetry a | | | | | | hang | e <10 | % fro | m | |
| | | | | | | | Biota | Microalgae | Biomass and community composition of phytoplankton and benthic microalgae community | composition suitable for invertebrates, fish, birds and recreational use | Maintain low μg/ℓ) and a c | | | | | | | | • • | 'll- a | < 50 |

Table 13: Resource Quality Objectives for ESTUARIES in priority Resource Units in the Integrated Unit of Analysis D10 Diep

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--|--|---|
| | | | | | | | | | Extent, distributior and richness of macrophytes | Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use | Maintain the distribution and area cover of macrophyte habitats particularly the salt marsh |
| | | | | | | | | Invertebrates | Macrofauna community composition, abundance and richness | Abundance and community composition of Invertebrates suitable for fish, birds | Restore and maintain species richness, distribution of species and mix (low species abundance, high dominance); Indicator species such as <i>Capitella capitata</i> , should not dominate benthic species at any site; <i>Callianassa kraussi</i> and <i>Upogebia africana</i> distribution patterns similar to reference state. |
| | | | | | | | | Fish | Fish community composition, abundance and richness | Abundance and community composition of fish community suitable for birds | Restore and maintain the full complement of estuarine resident and estuary associated marine present in the estuary with population sizes sufficient to ensure their persistence in perpetuity; Ensure that exotic freshwater species do not increase to levels where they can exclude any more indigenous species through predation or competitive interactions; Maintain recruitment of adult and juvenile fish at present levels. |
| | | | | | | | | Birds | Avifauna community composition, abundance and richness | Health avifauna community contributing to conservation of avifauna species in SA | Retain at least 90% of the baseline species richness, abundance and diversity of the bird community determined using regression slope based on a 3-year running average. |

Table 14: Resource Quality Objectives for ESTUARIES in priority Resource Units in the Integrated Unit of Analysis E11 Peninsula

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | | 1 | RQO | Nun | neri | с | | | | | |
|----------|-------|-------------------------|-------|------------------|--------------------------|-----|-----------|---------------|-----------|--|---|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | | | | | | | | | Freshwater inflow does no | Months | Oct | Nov | Dec | Jan | Feb | Anr | May | Jun | lиL | Aug | Sep | Annual |
| eninsula | = | G22A | 1-E04 | Wildevöelvlei | Bxi14 | D | Quantity | Surface flow | Flow | exceed requirements fo maintaining water quality and habitat suitable for flora and fauna | | 120 % | 120 % | 120 % | 120 % | 120 % | 120 % | 120 % | 120 % | 120 % | 120 % | 120 % | 120 % |
| E11 P | | 0 | E1 | Wilde | | | Quality | | DIN | Inorganic nutrient concentrations not to exceed | River inflow Wildevoelv lagoon): <2 | lei: « | <100 |)0 μ | | Low | er E | stua | ry (b | acks | hor | e | |
| | | | | | | | Quality | Nutrients | DIP | TPCs for macrophytes and microalgae | Wastewate Wildevoelv lagoon): <5 | lei: « | <500 | | | | r est | tuary | y (ba | icksł | ore | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|-------------------|--|--|---|
| | | | | | | | | Salinity | Salinity | | Average salinity in lower estuary (backshore lagoon) >10, maximum = 35, average salinity in Wildevoelvlei > 2 |
| | | | | | | | | System variables | Dissolved oxygen | System variables not to exceed TPCs for biota | >4 mg.l ⁻¹ |
| | | | | | | | | | Enterococci | Concentrations of waterborne | ≤185 Enterococci/100 ml) (90th percentile, hazen system) |
| | | | | | | | | Pathogens | Escherichia coli | pathogens should be maintained in an Acceptable category for full contact recreation | ≤500 E. coli/100 ml (90th percentile, hazen system) |
| | | | | | | | | Li das dan sastas | Mouth state | | Mouth should remain open >70% of the time |
| | | | | | | | | Hydrodynamics | Tidal variation | Habitat health adequate for | <10% change from present state |
| | | | | | | | Habitat | Sediments | Sediment characteristics, Channel shape/size | microalgae, macrophytes, invertebrates, fish, birds and recreational use | Bathymetry and sediment MdØ change <10% from baseline |
| | | | | | | | | Microalgae | · · | | Improvement from current hypereutrophic state where toxic cyanobacteria are common and flow to the sea |
| | | | | | | | Biota | Macrophytes | Extent, distribution and richness of macrophytes | Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use | Retain present species richness, distribution of species and mix (low species abundance, high dominance); Maintain the fringing vegetation around the vleis as this is important for bank stabilisation and nutrient uptake; Improve connectivity between the sea, channel and lower vlei; Control the spread of invasive floating aquatic macrophyte species present in the vleis e.g. water fern. |
| | | | | | | | | Invertebrates | Macrofauna community composition, abundance and richness | Abundance and community composition of Invertebrates suitable for fish, birds | Move from a D category to a C category. The estuary should have a viable population of Callichirus kraussi in the backwater lagoon (10/m2). In addition, the invertebrate community should include 2 other estuarine species in the canal. At least three marine invertebrate species present near the mouth. |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--|--|--|
| | | | | | | | | Fish | Fish community composition, abundance and richness | | Maintain fish assemblage that includes at least two species of mullet, <i>Liza richardsonii</i> and either/both <i>Mugil cephalus</i> and <i>Pseudomyxus capensis</i> . Substantial seasonal fluctuations in abundance of these mullet species are expected to occur, but mullet should remain more abundant than the alien freshwater species currently inhabiting the vleis. |
| | | | | | | | | Birds | Avifauna community composition, abundance and richness | Health avifauna community contributing to conservation of avifauna species in SA | Retain at least 90% of the baseline species richness, abundance and diversity of the bird community determined using regression slope based on a 3-year running average. |

Table 15: Resource Quality Objectives for ESTUARIES in priority Resource Units in the Integrated Unit of Analysis E12 Cape Flats

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric | | | | | | | | | | | | |
|----------------|-------|-------------------------|---------|------------------|--------------------------|-----|-----------|-----------------------|--------------------|--|---|-----------|------|------|-------|-------|-------|--------------|-------|------|-------|---------------|--|
| | | | | | | | Quantity | Surface flow | Flow | Freshwater inflow adequate to | Months | Oct | Nov | Dec | Jan | Feb | Mar | Apr | Jun | InL | Aug | Sep Annual | |
| | | | | | | | | | | maintain water quality and habitat suitable for flora and fauna. | l | 74 % | 64 % | % 69 | 68 % | 61% | 66 % | 68 % 76 % | 81% | 87 % | 88 % | 85 % 84 % | |
| | σ. | | | | | | | DIN | Inorganic nutrient | River inflow | | | | -1 | | | | | | | | | |
| ß | | | | vlei | | | Quality | Nutrients Salinity | | concentrations not to exceed TPCs for macrophytes and | d Estuary: <150 µg.l-1 River inflow: <300 µg.l-1 | | | | | | | | | | | | |
| e Fla | | ¥ | 05 | | | | | | DIP | microalgae Estuary: <100 µg.l-1 | | | | | | | | | | | | | |
| E12 Cape Flats | ≡ | G22K | E12-E05 | Zandvlei | Bxi9 | D | | | Salinity | Salinity distribution not to exceed TPCs for fish, invertebrates, macrophytes and microalgae | 15 < Average salinity <35 | | | | | | | | | | | | |
| | | | | | | | | System variables | Dissolved oxygen | System variables not to exceed TPCs for biota | >4 mg.l-1 | >4 mg.l-1 | | | | | | | | | | | |
| | | | | | | | | | Enterococci | Concentrations of waterborne | ≤185 Enterc | coc | ci/1 | 00 r | nl) (| (90tł | n pe | rcen | tile, | haze | en sy | /stem) | |
| | | | | | | | | Pathogens | Escherichia coli | pathogens should be maintained in an Acceptable category for intermediate contact recreation. | ≤500 E. coli, | /100 | 0 ml | (901 | th p | erce | entil | e, ha | zen | syst | em) | | |
| | | | | | | | Habitat | Hydrodynamics | Mouth state | Habitat health adequate for | Mouth shou | ld r | ema | in o | per | ז >20 |)% (| of the | e tim | ie | | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | R | QO | Num | neric | | | | | |
|----------------|-------|-------------------------|---------|------------------|--------------------------|--|---|---|--|---|--|-------------------------------------|-------|-------|------|-------|-------|-------|-------|-------|--------|
| | | | | | | | | Sediments | Sediment characteristics, Channel shape/size | microalgae, macrophytes, invertebrates, fish, birds and recreational use | Bathymetry ar baseline | v and sediment MdØ change <10% from | | | | | | | | | |
| | | | | | | | | Microalgae | Biomass and community composition of phytoplankton and benthic microalgae community | Phytoplankton biomass and composition suitable for invertebrates, fish, birds and recreational use | Maintain low phytoplankton biomass (chlorophyll- a < 20 $\mu g/\ell)$ and a diversity of phytoplankton groups. | | | | | | | | | | 0 |
| | | | | | | Macrophytes | Extent, distribution and richness of macrophytes | Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use | Maintain and/or restore distribution and area cover of macrophyte habitats particularly salt marsh | | | | | | | | | | | | |
| | | | | Biota | Invertebrates | Macrofauna community composition, abundance and richness | Abundance and community composition of Invertebrates suitable for fish, birds | Restore and maintain species richness, distribution of species and mix (low species abundance, high dominance); Indicator species such as <i>Capitella capitata</i> , should not dominate benthic species at any site; <i>Callianassa kraussi</i> and <i>Upogebia africana</i> distribution patterns similar to reference state. | | | | | | | | | | | | | |
| | | | | | Fish | Fish community composition, abundance and richness | Abundance and community composition of fish community suitable for birds | Restore and maintain the full complement of estuarine resident and estuary associated marine present in the estuary with population sizes sufficient to ensure their persistence in perpetuity; Ensure that exotic freshwater species do not increase to levels where they can exclude any more indigenous species through predation or competitive interactions; Maintain recruitment of adult and juvenile fish at present levels. | | | | | | | | | | e | | | |
| | | | | | | | | Birds | Avifauna community composition, abundance and richness | Health avifauna community contributing to conservation of avifauna species in SA | Retain at least 90% of the baseline species richness, | | | | | | | | | | |
| | | | | | | | | | | | Months t | Nov | Dec | Jan | Feb | Apr | May | unſ | Aug | Sep | Annual |
| E12 Cape Flats | ≡ | G22K | E12-E05 | Zeekoevlei | Bxi20 | D | Quantity | Surface flow | Flow Escherichia coli | Freshwater inflow adequate to maintain water quality and habitat suitable for flora and fauna | 4 | 120 % | 120 % | 120 % | 120% | 120 % | 120 % | 120 % | 120 % | 120 % | |
| | | | | | | | Quality | Nutrients | DIN | Inorganic nutrient | River inflow: < | 100 | 0 | 1 | | | | | | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|------------------|----------------------|---|---|
| | | | | | | | | | | concentrations not to exceed | Lower estuary: <1000 µg.l-1 |
| | | | | | | | | | DIP | TPCs for macrophytes and | River inflow: <500 μg.l-1 |
| | | | | | | | | | DIF | microalgae | Lower estuary: <500 µg.l-1 |
| | | | | | | | | Salinity | Salinity | Salinity distribution not to exceed TPCs for fish, invertebrates, macrophytes and microalgae | Average salinity in lower >10, maximum = 35 |
| | | | | | | | | System variables | Dissolved oxygen | System variables (temperature, pH, turbidity, dissolved oxygen, suspended solids and turbidity) not to exceed TPCs for biota | >4 mg.l ⁻¹ |
| | | | | | | | | | Enterococci | Concentrations of waterborne | ≤185 Enterococci/100 ml) (90th percentile, hazen system) |
| | | | | | | | | Pathogens | Escherichia coli | pathogens should be maintained in an Acceptable category for intermediate contact recreation | ≤500 E. coli/100 ml (90th percentile, hazen system) |
| | | | | | | | Habitat | Hydrodynamics | | Habitat health adequate for microalgae, macrophytes, invertebrates, fish, birds and recreational use | Mouth should remain open >30% of the time |
| | | | | | | | | | composition of | Phytoplankton biomass and composition suitable for invertebrates, fish, birds and recreational use | Phytoplankton biomass (measured as chlorophyll-a) <100 µg/ℓ) and a diversity of phytoplankton groups. |
| | | | | | | | Biota | Macrophytes | Extent, distribution | Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use | Maintain and/or restore distribution and area cover of macrophyte habitats particularly salt marsh |
| | | | | | | | | Invertebrates | composition, | Abundance and community composition of Invertebrates suitable for fish, birds | Restore and maintain species richness, distribution of species and mix (low species abundance, high dominance); Indicator species such as <i>Capitella capitata</i> , should not dominate benthic species at any site; <i>Callianassa kraussi</i> and <i>Upogebia africana</i> distribution patterns similar to reference state. |

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--|--|---|
| | | | | | | | | Fish | Fish community composition, abundance and richness | Abundance and community composition of fish community suitable for birds | Restore and maintain the full complement of estuarine resident and estuary associated marine present in the estuary with population sizes sufficient to ensure their persistence in perpetuity; Ensure that exotic freshwater species do not increase to levels where they can exclude any more indigenous species through predation or competitive interactions; Maintain recruitment of adult and juvenile fish at present levels. |
| | | | | | | | | Birds | Avifauna community composition, abundance and richness | Health avifauna community contributing to conservation of avifauna species in SA | Retain at least 90% of the baseline species richness, abundance and diversity of the bird community determined using regression slope based on a 3-year running average. |

Table 16: Resource Quality Objectives for ESTUARIES in priority Resource Units in the Integrated Unit of Analysis D6 Eerste

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | | R | QON | lume | eric | | | | | | |
|--------|-------|-------------------------|--------|------------------|--------------------------|-----|-----------|------------------|------------------|---|---|--------|---------|-------|----------------|------------|--------|-------|--------|--------|-------|------|--------|
| | | | | | | | | Surface flow | Flow | Freshwater inflow adequate to | | Months | Oct | Nov | Dec | Jan Feb | Mar | Apr | Мау | un lii | Aug | Sep | Annual |
| | | | | | | | Quantity | | | maintain water quality and habitat suitable for flora and fauna | | 120 % | 120 % | 120 % | 120 % 120 % | 120 % | 120 % | 120 % | 120 % | 120 % | 120 % | 120% | |
| | | | | | | | | | DIN | | River inflow: <1000 μg.l ⁻¹ d Lower estuary: <1000 μg.l ⁻¹ | | | | | | | | | | | | |
| | | | | ~ | | | | Nutrients | | concentrations not to exceed TPCs for macrophytes and | River inflow: <500 μg.l ⁻¹ | | | | | | | | | | | | |
| Eerste | | т | 90 | stua | | | | | DIP | microalgae | Lower estua | | | | | | | | | | | | |
| D6 Eei | Ξ | G22H | D6-E06 | Eerste Estuary | Bxi3 | D | Quality | Salinity | Salinity | Salinity distribution not to exceed TPCs for fish, invertebrates, macrophytes and microalgae | Average sal | inity | r in le | we | r >10 | , ma | kimu | m = | 35 | | | | |
| | | | | | | | | System variables | Dissolved oxygen | System variables not to exceed TPCs for biota | >4 mg.l- ¹ | | | | | | | | | | | | |
| | | | | | | | | | Enterococci | | ≤185 Entero | ococ | ci/1 |)0 n | nl) (90 |)th p | erce | ntile | e, haz | en s | yste | m) | |
| | | | | | | | | Pathogens | Escherichia coli | category for full contact | ≤500 E. coli | /100 |) ml | (90t | h per | cent | ile, ł | naze | n syst | tem) | | | |
| | | | | | | | Habitat | Hydrodynamics | Mouth state | recreation Habitat health adequate for | Dormoncot | | on | | | | | | | | | | |
| | | | | | | | napitat | Hydrodynamics | wouth state | Habitat health adequate for | Permanent | iy op | en | | | | | | | | | | |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--|---|---|
| | | | | | | | | | Tidal variation | microalgae, macrophytes, invertebrates, fish, birds and recreational use | <10% change from present state |
| | | | | | | | | Microalgae | composition of | Phytoplankton biomass and composition suitable for invertebrates, fish, birds and recreational use | Maintain low phytoplankton biomass (chlorophyll- a < 20 µg/ℓ) and a diversity of phytoplankton groups. |
| | | | | | | | | Macrophytes | Extent, distribution and richness of macrophytes | Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use | Restore and maintain the distribution and area cover of macrophyte habitats particularly salt marsh |
| | | | | | | | Biota | Invertebrates | composition, | Abundance and community composition of Invertebrates suitable for fish, birds | Restore and maintain species richness, distribution of species and mix (low species abundance, high dominance); Indicator species such as Capitella capitata, should not dominate benthic species at any site; Callianassa kraussi and Upogebia africana distribution patterns similar to reference state. |
| | | | | | | | | Fish | composition, abundance and | Abundance and community composition of fish community suitable for birds | Restore and maintain the full complement of estuarine resident and estuary associated marine present in the estuary with population sizes sufficient to ensure their persistence in perpetuity; Ensure that exotic freshwater species do not increase to levels where they can exclude any more indigenous species through predation or competitive interactions; Maintain recruitment of adult and juvenile fish at present levels. |
| | | | | | | | | | composition, | Health avifauna community contributing to conservation of avifauna species in SA | Retain at least 90% of the baseline species richness, abundance and diversity of the bird community determined using regression slope based on a 3-year running average. |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | | | | R | 201 | Num | eric | | | | | |
|----------------|-------|-------------------------|--------|------------------|--------------------------|-----|-----------|------------------|---|---|-------------------------------|-------|--------|-------|------------|-------|---------|-------|--------|-------|-------|--------|
| | | | | | | | | | | Freshwater inflow adequate to | | Oct | Nov | Dec | han Feh | Mar | Apr | May | un 1 | Aug | Sep | Annual |
| | | | | | | | Quantity | Surface flow | Flow | maintain water quality and habitat suitable for flora and fauna | | 83 % | 56 % | 27 % | 10% | 18 % | 35 % | 49 % | 78% | % 06 | 88 % | 76 % |
| | | | | | | | | Nutrients | DIN | Inorganic nutrient concentrations not to exceed | River inflow: Lower estuar | ry: « | <300 | μg. | -1 | | | | | | | |
| | | | | | | | | | DIP | TPCs for macrophytes and microalgae | River inflow: Lower estuar | | | | | | | | | | | |
| | | | | | | | Quality | Salinity | Salinity | Salinity distribution not to exceed TPCs for fish, invertebrates, macrophytes and microalgae | Average salir | nity | in lo | ower | esti | uary | >15, | max | imur | n = 3 | 5 | |
| | | | | ~ | | | | System variables | | System variables not to exceed TPCs for biota | >4 mg.l ⁻¹ | | | | | | | | | | | |
| , کړ | | | ~ | tuar | | | | | Enterococci | Concentrations of waterborne | ≤185 Enteroo | coc | ci/10 |)0 m | I) (9 | 0th p | erce | ntile | e, haz | en s | yste | m) |
| D7 Sir Lowry's | = | 622J | D7-E07 | Lourens Estuary | Bxi4 | D | | Pathogens | Escherichia coli | pathogens should be maintained in an Acceptable category for intermediate contact recreation | ≤500 E. coli/: | 100 |) ml (| (90tł | n pei | rcent | tile, l | naze | n sys | em) | | |
| | | | | | | | | Hydrodynamics | Mouth state | Habitat health adequate for | Permanently | ор | en | | | | | | | | | |
| | | | | | | | | | Tidal variation | microalgae, macrophytes, | <10% change | e fro | om p | orese | ent s | tate | | | | | | |
| | | | | | | | Habitat | Sediments | Sediment characteristics, Channel shape/size | invertebrates, fish, birds and recreational use | Bathymetry a baseline | and | l sed | imer | nt M | dØ c | han | ge <1 | .0% f | rom | | |
| | | | | | | | Biota | Microalgae | composition of | Phytoplankton biomass and composition suitable for invertebrates, fish, birds and recreational use | Maintain low µg/ℓ) and a c | | | | | | | • | | ıyll- | a < 2 | 20 |
| | | | | | | | | Macrophytes | Extent, distribution | Macrophyte cover and composition suitable for invertebrates, fish, birds and recreational use | Restore and macrophyte | | | | | | | | | cov | er of | F |

Table 17: Resource Quality Objectives for ESTUARIES in priority Resource Units in the Integrated Unit of Analysis D7 Sir Lowry's

| IUA | Class | Quaternary Catchment | RU | Resource Name | Biophysical Node Name | TEC | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|------------------|--------------------------|-----|-----------|---------------|--|--|---|
| | | | | | | | | Invertebrates | Macrofauna community composition, abundance and richness | Abundance and community composition of Invertebrates suitable for fish, birds | Restore and maintain species richness, distribution of species and mix (low species abundance, high dominance); Indicator species such as Capitella capitata, should not dominate benthic species at any site; Callianassa kraussi and Upogebia africana distribution patterns similar to reference state. |
| | | | | | | | | Fish | Fish community composition, abundance and richness | Abundance and community composition of fish community suitable for birds | Restore and maintain the full complement of estuarine resident and estuary associated marine present in the estuary with population sizes sufficient to ensure their persistence in perpetuity; Ensure that exotic freshwater species do not increase to levels where they can exclude any more indigenous species through predation or competitive interactions; Maintain recruitment of adult and juvenile fish at present levels. |
| | | | | | | | | Birds | Avifauna community composition, abundance and richness | Health avifauna community contributing to conservation of avifauna species in SA | Retain at least 90% of the baseline species richness, abundance and diversity of the bird community determined using regression slope based on a 3-year running average. |

Table 18: Resource Quality Objectives for DAMS in priority Resource Units in the Berg Catchment

| IUA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub-component | Indicator | RQO Narrative | | | | | RC | io n | ume | eric | | | | | | |
|---------------|-------|-------------------------|--------|---------------|-----------|---------------|--|--|---|-------|---------|-------------------|--------------------|-------|--------|-------|-------|-----------|---------|-------|-------|--------|
| bū | | | | | Quantity | Low flows | Dam level Flow releases: Berg EWR1 in G10A nMAR = 141.68 million m3/a pMAR: 126.00 | downstream. Water intake | Months Maintenance low flows (million cubic metres) | 2.143 | 1.293 Q | 1.071 Dec | | | | | | 4.147 Inf | 4.285 F | | Sep / | Annual |
| D8 Upper Berg | II | G10A | D8-D01 | Berg Dam | | High flows | million m3/a REC = C category | During the wet season high flow ecological releases are made according to the decision-support system. | Maintenance high flows (million cubic metres) | 0.000 | 0.544 | 0.544 | 0.000 | 0.000 | 0.000 | 0.778 | 0.000 | 4.666 | 10.109 | 0.000 | 0.000 | 11.839 |
| | | | | | | | Ortho-phosphate (PO ₄ -P) | The system must be maintained in a mesotrophic (moderately | ≤ 0.015 millig | ram | s/litr | e (50 |) th pe | ercer | ntile) |) | | | | | | |
| | | | | | Quality | Nutrients | Total inorganic nitrogen (TIN)1 | enriched) state or better to protect against nuisance algal blooms and excessive water treatment costs. | ≤ 0.07 milligra | ams, | /litre | (50 ^{tl} | ^h per | cent | ile) | | | | | | | |

STAATSKOERANT, 10 MEI 2019

No. 42451 **161**

| UA | Class | Quaternary | RU | Resource Name | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|---------------|-------|------------|--------|--------------------|-----------|------------------|---|---|---|
| | | Catchment | | | | Salts | Electrical conductivity | Salt levels must be maintained at concentrations where they do not impact negatively on the ecosystem, are maintained in an Ideal category for domestic and irrigation water supply. | ≤ 30 milliSiemens/metre (95 th percentile) |
| | | | | | | System variables | рН | The water in the dam is naturally | 5.5 ≥ pH ≤ 7.5 (5 th and 95 th percentiles) |
| | | | | | | Pathogens | E coli | The dam must be maintained in a state that is in an Ideal category for full contact recreation to protect its domestic water supply purpose. | ≤ 130 counts/100ml (95 th percentile) |
| | | | | | Quantity | Low flows | Dam levels | Dam levels must be sufficient for urban and industrial use water supply, and to supply some irrigators. | % of dam volume. No EWR site |
| הכופ | | | 5 | | | | Ortho-phosphate (PO₄-P) Total inorganic nitrogen (TIN) | The reservoir is currently in a Natural state and should be kept in an oligotrophic state. for supply to the City of Cape Town and | ≤ 0.005 milligrams/litre (50 th percentile) |
| | ΙΙ | G10B | D8-D02 | Wemmershoek Dam | Quality | Nutrients | Ortho-phosphate (PO₄-P) Total inorganic nitrogen (TIN) | Paarl. As a key domestic water supply reservoir this status should be maintained and protected. The reservoir is currently in a Natural state and should be kept in an oligotrophic state. for supply to the City of Cape Town and Paarl. As a key domestic water supply reservoir this status should be maintained and protected. | ≤ 0.50 milligrams/litre (50 th percentile) |
| םל רטאבו םכוצ | 11 | G10F | B4-D03 | Voelvlei Dam | Quantity | Low flows | Dam levels | Dam levels must be sufficient for urban and industrial use water supply via the two WTWs, and releases to Berg River for human and irrigation use. | % of dam volume. No EWR site |
| ă | | | | | Quality | Nutrients | Ortho-phosphate (PO₄-P) | The reservoir is currently in an Eutrophic state and should be | ≤ 0.025 milligrams/litre (50 th percentile) |

| UA Clas | Quaternary Catchment | RU | Resource Name | Component | Sub-component | Indicator | RQO Narrative | RQO Numeric |
|--------------------|-------------------------|--------|---------------|-----------|---------------|---|--|--|
| | | | | | | Total inorganic nitrogen (TIN) | improved to a mesotrophic state or better to protect the water supply to the City of Cape Town and Swartland towns against harmful algal blooms and taste & odour problems in treated domestic water. | ≤ 0.70 milligrams/litre (50 th percentile) |
| | | | | | Salts | Electrical conductivity | Salt levels must be maintained at concentrations where they do not impact negatively on the ecosystem, and are in an Ideal category for domestic water use and for irrigation water use. | ≤ 30 milliSiemens/metre (95 th percentile) |
| | | | | | Pathogens | E coli, Faecal coliforms | The system must be maintained in a state that is in an Acceptable category for intermediate contact recreation | ≤ 2000 counts/100ml (95 th percentile) |
| | | | | Quantity | Low flows | Dam levels | Water levels in the weir must be sufficient for supply for human use via the Withoogte WTW. | % of dam volume |
| | | | | | | Ortho-phosphate (PO₄-P) Total inorganic nitrogen (TIN) | The reservoir is currently in a Eutrophic state and should be in the short term be maintained in its current state or better. The long- | ≤ 0.025 milligrams/litre (50 th percentile) |
| r Berg | | 04 | Misverstand | | Nutrients | Ortho-phosphate (PO₄-P) Total inorganic nitrogen (TIN) | term objective should be to improve the nutrient status to a mesotrophic state or better to protect the water supply to the West Coast towns. | ≤ 2.5 milligrams/litre (50 th percentile) |
| B4 Lower Berg = | G10K | B4-D04 | Weir | Quality | Salts | Electrical conductivity | Salt levels must be maintained at concentrations where they do not impact negatively on the ecosystem, and are in an Ideal category for domestic and industrial water use, and for irrigation water use. | ≤ 70 milliSiemens/metre (95 th percentile) |
| | | | | | | E. coli | | ≤ 1000 counts/100 ml (95 th percentile) |
| | | | | | Pathogens | Faecal coliforms | in a state that is safe for domestic water use (with treatment) and for intermediate contact recreation as the dam is a popular recreation venue. | ≤ 1000 counts/100 ml (95 th percentile) |

No. 42451 163

| IUA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub-component | Indicator | RQO Narrative | | | | F | QO N | lume | eric | | | | | |
|----------------|-------|-------------------------|--------|------------------------|-----------|---------------|--|--|---|---------|---------|---------------------|--------|--------|--------|--------|-------|-------|-------|--------|
| | | | | | Quantity | Low flows | Dam levels | Dam levels must be sufficient for releases to the Lower Steenbras Dam for urban and industrial use and protection of ecosystem functioning downstream of the Lower Steenbras Dam, hydropower energy generation via the Steenbras Pumped Storage Scheme as well as for water supply to the Western Cape Water Supply System (City of Cape Town) via the Faure WTW. | | ume | | | | | | | | | | |
| Sir Lowry's | 11 | G40A | D7-D05 | Upper Steenbras Dam | | Nutrients | Ortho-phosphate (PO₄-P) Total inorganic nitrogen (TIN) | The system must be maintained in a mesotrophic state or better. | ≤ 0.015 milligr | ams/l | itre (! | 50 th p | ercen | tile) | | | | | | |
| D7 | | | | | | | Ortho-phosphate (PO₄-P) Total inorganic nitrogen (TIN) | | ≤ 0.07 milligra | ıms/lit | re (5 | 0 th pe | rcenti | ile) | | | | | | |
| | | | | | Quality | Salts | Electrical conductivity | Salt levels must be maintained at concentrations where they do not impact negatively on the ecosystem, and are in an Ideal category for domestic and industrial water use, and for hydropower generation. | ≤ 30 milliSien | nens/r | netre | e (95 th | perce | entile | e) | | | | | |
| | | | | | | Detterson | E. coli | The system must be maintained in | ≤ 130 counts, | /100 n | nl (95 | th per | centil | e) | | | | | | |
| | | | | | | Pathogens | Faecal coliforms | a state that is safe for municipal use (with treatment). | ≤ 130 counts, | /100 n | nl (95 | th per | centil | e) | | | | | | |
| | | | | | | | Dam level Spills | Dam levels must remain sufficient | Months | Oct N | ov De | ec Jan | Feb | Mar | Apr Ma | ay Jur | lul r | Aug | Sep / | Annual |
| D7 Sir Lowry's | II | G40A | D7-D06 | Lower Steenbras Dam | Quantity | Low flows | from dam. Flow releases: Berg EWR8 in G40A below Lower Steenbras Dam nMAR = 54.88 million m3/a | to provide for supply to the Western Cape Water Supply System (City of Cape Town) via the Steenbras WTW, and low flows to the lower Steenbras River and estuary for the protection of ecosystem functioning downstream. | Maintenance low flows (million cubic metres) | 0.427 | 0.323 | 0.180 | 0.149 | 0.144 | 0.173 | 0.384 | 0.506 | 0.582 | 0.502 | 3.852 |

| IUA Class | Quaternary Catchment | RU | Resource Name | Component | Sub-component | Indicator | RQO Narrative | | | | | RC | 10 N | lum | eric | | | | | | |
|-----------|-------------------------|----|---------------|-----------|---------------|-----------------------------------|--|--|-------|--------|--------------------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | High flows | | requirements, but within the | Maintenance high flows (million cubic metres) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.077 | 0.077 | 0.307 | 0.307 | 0.077 | 0.845 |
| | | | | | | Ortho-phosphate (PO₄-P) | The reservoir must be maintained in a mesotrophic state or better. | ≤ 0.015 millig | ram | s/litr | e (50 |) th pe | erce | ntile |) | | | | | | |
| | | | | | | Total inorganic nitrogen (TIN) | Salt levels must be maintained at concentrations where they do not | ≤ 0.07 milligra | ams/ | /litre | (50 ^{tl} | ^h per | cen | tile) | | | | | | | |
| | | | | Quality | | Electrical conductivity | impact negatively on the ecosystem, and are in an Ideal category for domestic and industrial water use. | ≤ 30 milliSien | nens, | /met | re (9 | 95 th p | perc | entil | e) | | | | | | |
| | | | | | | E. coli | The reservoir must be maintained | ≤ 130 counts, | /100 | ml (9 | 95 th (| perc | enti | le) | | | | | | | |
| | | | | | Pathogens | Faecal coliforms | in a state that is safe for contact recreation. | | | | | | | | | | | | | | |

No. 42451 165

Table 19: Resource Quality Objectives for GROUNDWATER in priority Resource Units in the Berg Catchment

| IUA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub Component | Indicator/ Measure | RQO Narrative | RQO Numeric |
|------------------------|-------|-------------------------|-----------------------|----------------------|-----------|-------------------|---|---|---|
| | | | | | Quantity | Abstraction | Seasonal abstraction: water level recovers from abstraction impact during wet season, under consideration of climate change and drought cycles. Permanent abstraction: water level decline stabilises under consideration of aquifer response time. | Groundwater use should be sustainable for all users and the environment | n/a |
| | | 9 | 4-Paarl-Upper Berg | Groundwater (all) | | Low flow in river | Compliance with the low flow requirements in the river (as per riverine RQO) | Maintain (groundwater component of) the low flow requirements in the river | Maintenance low flow requirements: 29.177 Mm3/a (34.39 %MAR) at G1H076 (Bvii13); 27.421 Mm3/a (19.35 %MAR) at G1H077 (Bviii1) |
| | | | | | | Nutrients | NO ₃ (as N) | Groundwater should be fit for | < 3.3 mg/l |
| D8 Upper Berg | | | | | | Salts | EC | domestic use after treatment; | < 70 mS/m |
| erB | = | | | | Quality | System variable | рН | and groundwater quality shall | 5.2 - 8.4 |
| ddſ | - | | | | | Pathogens | E-coli | not show a deteriorating trend | 0 counts / 100 ml |
|) 8 L | | | | | | Pathogens | Total Coliform | from natural background | <10 counts / 100ml |
| | | | | | Quantity | Discharge | Relative water levels between groundwater and suface water (in mamsl) | The natural gradient between groundwater and surface water should be maintained | n/a |
| | | | 4-Paarl-Upper Berg | Groundwater (all) | Quantity | Discharge | Buffer zones | No groundwater abstraction around wetland and river FEPAs in accordance with the implementation manual for FEPAs. | 250m |
| | | | | | | Nutrients | NO ₃ (as N) | Groundwater should be fit for | < 3.3 mg/l |
| | | | | | | Salts | EC | domestic use after treatment; | < 70 mS/m |
| | | | | | Quality | System variable | рН | and groundwater quality shall | 5.2 - 8.4 |
| | | | | | | Pathogens | E-coli | not show a deteriorating trend | 0 counts / 100 ml |
| | | | | | | Pathogens | Total Coliform | from natural background | <10 counts / 100ml |
| C5 Berg Tributaries | = | GIOE | 5-Tulbagh Valley | Groundwater (all) | Quantity | Abstraction | Seasonal abstraction: water level recovers from abstraction impact during wet season, under consideration of climate change and drought cycles. Permanent abstraction: water level decline stabilises under consideration of aquifer response time. | Groundwater use should be sustainable for all users and the environment | n/a |

| IUA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub Component | Indicator/ Measure | RQO Narrative | RQO Numeric |
|---------------|-------|-------------------------|-------------|----------------------------|-----------|-------------------|--|---|--|
| | | | | | Quantity | Discharge | Buffer zones | No groundwater abstraction around wetland and river FEPAs in accordance with the implementation manual for FEPAs. | 250m |
| | | | | | | Pathogens | E-coli | Groundwater should be fit for | 0 counts / 100 ml |
| | | | | | Quality | Pathogens | Total Coliform | domestic use after treatment; and groundwater quality shall not show a deteriorating trend from natural background | <10 counts / 100ml |
| | | | | | | Nutrients | NO3 (as N) | Groundwater should be fit for | n/a |
| | | | | | Quality | System variable | рН | domestic use after treatment; | n/a |
| | | | | | Quality | Salts | EC | and groundwater quality shall not show a deteriorating trend from natural background The natural gradient between groundwater and surface water | n/a |
| | | | | | | Discharge | Relative water levels between groundwater and suface water (in mamsl) | , i i i i i i i i i i i i i i i i i i i | n/a |
| . Berg | | _ | | Groundwater (all) | Quantity | | Buffer zones | No groundwater abstraction around wetland and river FEPAs in accordance with the implementation manual for FEPAs. | 250m |
| B4 Lower Berg | = | G10J | 6-24 Rivers | | | Low flow in river | Compliance with the low flow requirements in the river (as per riverine RQO) | Maintain (groundwater component of) the low flow requirements in the river | Maintenance low flow requirements: 114.338 Mm3/a (13.28 %MAR) at G1H013 (Bvii6) |
| | | | | | | System variable | рН | | 5.2 – 8.1 |
| | | | | | Quality | Pathogens | E-coli | Construction of the City | 0 counts / 100 ml |
| | | | | | | Pathogens | Total Coliform | Groundwater should be fit for domestic use after treatment; | <10 counts / 100ml |
| | | | | Groundwater | | Nutrients | NO3 (as N) | and groundwater quality shall | < 6.9 mg/l |
| | | | | (Cenozoic coastal sand) | Quality | Salts | EC | not show a deteriorating trend from natural background | < 942 mS/m |
| | | | | Groundwater | Quality | Nutrients | NO3 (as N) | nom natural background | <11.0 mg/l |
| | | | | (Basement) | Quality | Salts | EC |] | < 875 mS/m |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub Component | Indicator/ Measure | RQO Narrative | RQO Numeric |
|----------------------------------|-------|-------------------------|--------------|---|-----------|-------------------|---|---|--|
| | | | | | | Abstraction | Seasonal abstraction: water level recovers from abstraction impact during wet season, under consideration of climate change and drought cycles. Permanent abstraction: water level decline stabilises under consideration of aquifer response time. | Groundwater use should be sustainable for all users and the environment | n/a |
| baan | | | | | | Groundwater level | Water level | Minimum water level in abstraction boreholes within 2.5km from the ocean to avoid saline intrusion | >1 mamsl |
| y and A2 Lange | = | G10M | 8-West Coast | | Quantity | | Relative water levels between groundwater and suface water (in mamsl) | The natural gradient between groundwater and surface water should be maintained | n/a |
| A1 Berg Estuary and A2 Langebaan | | | | | | Discharge | Buffer zones | No groundwater abstraction around wetland and river FEPAs in accordance with the implementation manual for FEPAs. | 250m |
| | | | | | | | Compliance with the groundwater flow requirements to the Langebaan Lagoon | Compliance to the groundwater flow requirements to the Langebaan Lagoon, as per estuary RQO requirement | Groundwater inflow not <10% of present day (2017) rate |
| | | | | | | | Compliance with the groundwater flow requirements to the Langebaan Lagoon | Compliance to the groundwater flow requirements to the Langebaan Lagoon, as per estuary RQO requirement | Ground water level not <10% below present day (2017) level |
| | | G10M | 8-West Coast | Groundwater (Cenozoic coastal sand) | Quality | Nutrients | NO3 (as N) | Groundwater should be fit for domestic use after treatment; and groundwater quality shall not show a deteriorating trend | < 11.0 mg/l |
| | | U | | | | System variable | рН | from natural background | 7.1 - 8.4 |
| | | | | | | Salts | EC | 1 | < 520 mS/m |
| | | | | Groundwater | Quality | Nutrients | NO3 (as N) | Groundwater should be fit for | < 11.0 mg/l |

| UA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub Component | Indicator/ Measure | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|--------------|---|--|-----------------|---|--|--------------------|
| | | | | (Basement) | | Salts | EC | domestic use after treatment; and groundwater quality shall not show a deteriorating trend from natural background | < 1571 mS/m |
| | | | | Groundwater | Quality | Salts | PO ₄ | Groundwater should be fit for domestic use after treatment; and groundwater quality shall not show a deteriorating trend from natural background | < 0.3 mg/l |
| | | | | (all) | | Pathogens | E-coli | | 0 counts / 100 ml |
| | | | | | | Pathogens | Total Coliform | | <10 counts / 100ml |
| N/A | | G10L | 8-West Coast | Groundwater (all) Groundwater (Cenozoic coastal sand) | Quantity | Abstraction | Seasonal abstraction: water level recovers from abstraction impact during wet season, under consideration of climate change and drought cycles. Permanent abstraction: water level decline stabilises under consideration of aquifer response time. | Groundwater use should be sustainable for all users and the environment | n/a |
| | | | | | | Discharge | Relative water levels between groundwater and suface water (in mamsl) | The natural gradient between groundwater and surface water should be maintained | n/a |
| | | | | | | | Buffer zones | No groundwater abstraction around wetland and river FEPAs in accordance with the implementation manual for FEPAs. | 250m |
| | | | | | enozoic astal sand) oundwater asement) oundwater | Nutrients | NO3 (as N) | Groundwater should be fit for domestic use after treatment; and groundwater quality shall | < 8.2 mg/l |
| | | | | | | Salts | EC | Groundwater should be fit for domestic use after treatment; and groundwater quality shall not show a deteriorating trend | < 520 mS/m |
| | | | | Groundwater (Basement) | | Nutrients | NO3 (as N) | | < 11.0 mg/l |
| | | | | | | Salts | EC | | < 899 mS/m |
| | | | | Groundwater (all) | | | PO ₄ | | < 0.3 mg/l |
| | | | | | | System variable | рН | | 6.7 - 8.3 |
| | | | | | | Pathogens | E-coli | from natural background | 0 counts / 100 ml |
| | | | | | | Pathogens | Total Coliform | | <10 counts / 100ml |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub Component | Indicator/ Measure | RQO Narrative | RQO Numeric |
|---------------|-------|-------------------------|---------------|--|-----------|-------------------|---|--|--------------------|
| A3 West Coast | Ξ | ۵ | 9-Atlantis | Groundwater (all) | Quantity | Abstraction | Seasonal abstraction: water level recovers from abstraction impact during wet season, under consideration of climate change and drought cycles. Permanent abstraction: water level decline stabilises under consideration of aquifer response time. | Groundwater use should be sustainable for all users and the environment | n/a |
| | | | | | | Groundwater level | Water level | Minimum water level in abstraction boreholes within 2.5km from the ocean to avoid saline intrusion | >1 mamsl |
| | | | | | | Discharge | Relative water levels between groundwater and suface water (in mamsl) | The natural gradient between groundwater and surface water should be maintained | n/a |
| | | | | | | | Buffer zones | No groundwater abstraction around wetland and river FEPAs in accordance with the implementation manual for FEPAs. | 250m |
| | | | | Groundwater (Cenozoic coastal sand) Groundwater (Basement) Groundwater (all) | Quality | Nutrients | NO3 (as N) | domestic use after treatment; and groundwater quality shall not show a deteriorating trend from natural background Groundwater should be fit for domestic use after treatment; and groundwater quality shall not show a deteriorating trend | < 2.3 mg/l |
| | | | | | | Salts | EC | | < 287 mS/m |
| | | | | | | | NO3 (as N) | | < 10.4 mg/l |
| | | | | | | | EC | | < 1052 mS/m |
| | | | | | | | pH | | 6.7 – 8.3 |
| | | | | | | | E-coli | | 0 counts / 100 ml |
| | | | | | | Pathogens | Total Coliform | | <10 counts / 100ml |
| D10 Diep | Ξ | G21D | 10-Malmesbury | Groundwater (all) | Quantity | | Seasonal abstraction: water level recovers from abstraction impact during wet season, under consideration of climate change and drought cycles. Permanent abstraction: water level decline stabilises under consideration of aquifer response time. | Groundwater use should be sustainable for all users and the environment | n/a |

| IUA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub Component | Indicator/ Measure | RQO Narrative | RQO Numeric |
|----------------|-------|-------------------------|--|-------------------------|-----------|-------------------|--|--|---|
| | | | | | | Discharge | Buffer zones | No groundwater abstraction around wetland and river FEPAs in accordance with the implementation manual for FEPAs. | 250m |
| | | | | | | Low flow in river | Compliance with the low flow requirements in the river (as per riverine RQO) | Maintain (groundwater component of) the low flow requirements in the river | Maintenance low flow requirements: 0.578 (6.22 %MAR) at node Biv6 (no gauge) |
| | | | | Superficial aquifers | Quantity | Discharge | Relative water levels between groundwater and suface water (in mamsl) | The natural gradient between groundwater and surface water should be maintained | n/a |
| | | | Groundwater (Cenozoic coastal sand) Groundwater | | | Nutrients | NO3 (as N) | | < 7.1 mg/l |
| | | | | | Salts | EC | | < 358 mS/m | |
| | | | | Groundwater | 1 | Nutrients | NO3 (as N) | Groundwater should be fit for domestic use after treatment; and groundwater quality shall not show a deteriorating trend from natural background | < 6.4 mg/l |
| | | | | (Basement) | Quality | Salts | EC | | < 617 mS/m |
| | | | | Groundwater | | System variable | pН | | 6.3 - 8.6 |
| | | | | | | Pathogens | E-coli | | 0 counts / 100 ml |
| | | | | (all) | | Pathogens | Total Coliform | - | <10 counts / 100ml |
| | | | | ape Flats (all) | - | Groundwater level | Water level | Minimum water level in abstraction boreholes within 2.5km from the ocean to avoid saline intrusion | >1 mamsl |
| E12 Cape Flats | = | G22C, G22D, G22E | 2-Cape Flats | | | Discharge | Buffer zones | No groundwater abstraction around wetland and river FEPAs in accordance with the implementation manual for FEPAs. | 250m |
| | | | | | | Low flow in river | Compliance with the lowflow requirements in the river | Maintain (groundwater component of) the low flow requirements in the river, as per surface water RQO requirement | Maintenance low flow: 0.348 Mm3/a (7.74 %MAR) at Bvii (no gauge) |

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| IUA | Class | Quaternary Catchment | RU | Resource Name | Component | Sub Component | Indicator/ Measure | RQO Narrative | RQO Numeric |
|-----|-------|-------------------------|----|----------------------------|-----------|-----------------|----------------------------------|---|--------------------|
| | | | | Superficial aquifers | Quantity | Discharge | groundwater and suface water (in | The natural gradient between groundwater and surface water should be maintained | n/a |
| | | | | Groundwater | | Nutrients | NO3 (as N) | Groundwater should be fit for domestic use after treatment; and groundwater quality shall not show a deteriorating trend | < 9.2 mg/l |
| | | | · | (Cenozoic coastal sand) | | System variable | pН | | 6.6 - 8.4 |
| | | | | coastal salid) | | Salts | EC | | < 180 mS/m |
| | | | | Groundwater | | Nutrients | | | < 11.0 mg/l |
| | | | | (Basement) | Quality | Salts | EC | | < 953 mS/m |
| | | | | Groundwater (all) | _ | Pathogens | E aoli | | 0 counts / 100 ml |
| | | | | | | | Total Coliform | | <10 counts / 100ml |