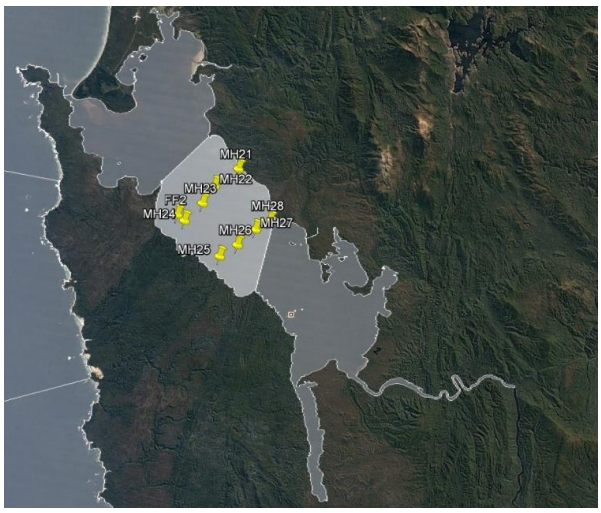
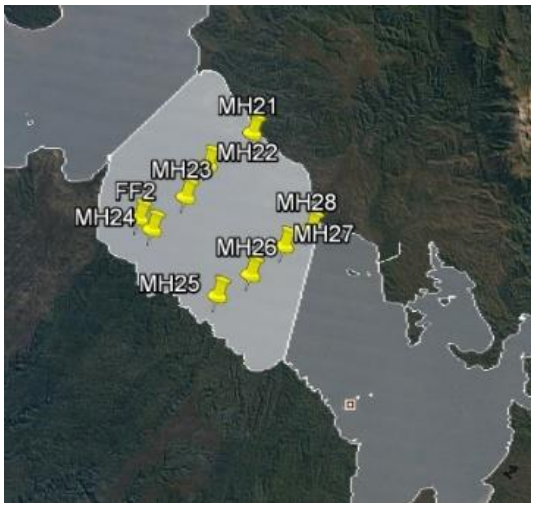
# Macquarie Harbour – Segment 120

The interim default guideline values (DGVs) for aquatic ecosystems presented herein have been derived from site specific information in accordance with the National Water Quality Management Strategy (NWQMS).




**Water Body Name**: Macquarie Harbour

**Segment:** 120

**IMCRA Mesoscale Region:** Franklin

**IMCRA Provincial Region**: Tasmanian Shelf

**Ecosystem Classification:** Slightly to Moderately Disturbed Ecosystem

**Data Provider:** EPA

**EPA Sites:** FF2, MH21, MH22, MH23, MH24, MH25, MH26, MH27, and MH28

**Period of record:** 04/05/1993 to 14/10/2009.

## Interim Default Guideline Values

Data from nine locations (as listed above) have been used in the derivation of the interim default guideline values (DGVs) presented here in. For each site field-based measurements and laboratory-based data from near the surface, at the halocline and approximately 1 metre from bottom have been used for this analysis.

The following tables display the combined data as percentiles for the surface, halocline and bottom of the water column. The surface figures apply to the top 2 metres of the water column. The halocline figures apply to the interface between the surface freshwater layer and marine water dominated layer where salinity is approximately 20 PPT. The bottom water figures apply to the bottom metre or so of the water column. Annual interim DGVs have also been derived for the depth ranges of 6-10 m, 11-15 m, 16-20 m and 21-25 m for field based measurements only as well as seasonal values for dissolved oxygen. The laboratory data for the halocline and bottom waters can be considered for nutrient interim DGVs for these depth ranges. The shaded values represent the interim DGVs for aquatic ecosystems for the depth or position indicated on an annual or seasonal basis. These can be applied as interim DGVs for aquatic ecosystems of waters encompassed within Segment 120 (as highlighted above). The interim DGVs for aquatic ecosystems are summarised in Appendix A.

Where there is insufficient data available to provide a 95% confidence interval for the guideline value for a parameter from the individual segment, data from the three sections within Macquarie Harbour (Segments 119, 120, and 121) is used. The following links provide Information on the IMCRA spatial network and the Interim Default guideline values for Coastal and Marine waters of Tasmania.

## Annual interim DGVs for Aquatic Ecosystems for Surface waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 8.4 | 8.6 | 9.0 | 9.9 | 10.7 | 11.1 | 12.6 | 368 |
| Dissolved Oxygen (%) | 90.9 | 94.3 | 96.0 | 99.5 | 104.4 | 112.3 | 119.0 | 374 |
| Salinity (PPT) | 2.1 | 3.4 | 4.8 | 7.9 | 10.6 | 12.0 | 13.4 | 379 |
| SpCond (µS/cm) | 3820 | 6218 | 8599 | 13747 | 17956 | 20200 | 22336 | 379 |
| pH field - sensor TC | 6.8 | 6.9 | 7.0 | 7.4 | 7.7 | 7.8 | 7.9 | 377 |
| Temperature (Celsius) | 8.7 | 9.4 | 10.2 | 14.3 | 17.6 | 19.9 | 20.9 | 379 |
| Turbidity (NTU) | 1.0 | 1.3 | 2.6 | 5.0 | 15.1 | 21.8 | 40.6 | 221 |
| Redox (mV) | 263 | 271 | 290 | 324 | 362 | 383 | 420 | 286 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 1.0 | 3.0 | 6.0 | 10.0 | 16.0 | 266 |
| Nitrite and Nitrate as N µg/L^ | 2.7 | 5.0 | 8.0 | 15.0 | 36.2 | 56.6 | 71.0 | 215 |
| Nitrate as N µg/L^ | 3.0 | 5.0 | 7.6 | 13.0 | 23.0 | 29.0 | 33.6 | 109 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 3.0 | 3.0 | 326 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 4.0 | 326 |
| TSS (mg/L) | 1.2 | 2.0 | 4.2 | 8.0 | 12.1 | 16.0 | 18.9 | 192 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Summer interim DGVs for Aquatic Ecosystems for Surface waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 8.2 | 8.2 | 8.4 | 9.0 | 9.7 | 10.1 | 10.2 | 105 |
| Dissolved Oxygen (%) | 93.6 | 95.0 | 96.9 | 100.5 | 107.8 | 110.7 | 114.6 | 112 |
| Salinity (PPT) | 3.4 | 4.4 | 6.5 | 9.4 | 12.1 | 13.7 | 14.7 | 112 |
| SpCond (µS/cm) | 6117 | 7926 | 11342 | 16083 | 20397 | 22760 | 24380 | 112 |
| pH field - sensor TC | 6.8 | 6.9 | 7.1 | 7.6 | 7.8 | 7.8 | 7.9 | 112 |
| Temperature (Celsius) | 14.2 | 15.8 | 16.5 | 18.6 | 20.7 | 21.6 | 22.3 | 112 |
| Turbidity (NTU) | 1.8 | 3.1 | 3.8 | 7.0 | 15.3 | 25.4 | 42.2 | 60 |
| Redox (mV) | 258 | 263 | 274 | 307 | 339 | 376 | 419 | 89 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 1.0 | 2.5 | 5.0 | 7.5 | 10.3 | 76 |
| Nitrite and Nitrate as N µg/L^ | 1.0 | 1.0 | 4.8 | 9.0 | 14.0 | 15.1 | 18.2 | 40 |
| Nitrate as N µg/L^ | 2.0 | 3.0 | 4.0 | 8.0 | 10.0 | 13.0 | 14.8 | 45 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 3.0 | 3.0 | 87 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 3.0 | 87 |
| TSS (mg/L) | 1.2 | 2.6 | 5.4 | 8.6 | 17.0 | 19.5 | 20.5 | 55 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Autumn interim DGVs for Aquatic Ecosystems for Surface waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 8.9 | 9.0 | 9.2 | 9.9 | 10.4 | 10.5 | 10.7 | 84 |
| Dissolved Oxygen (%) | 93.8 | 94.7 | 95.5 | 99.0 | 102.4 | 110.5 | 113.6 | 84 |
| Salinity (PPT) | 2.0 | 2.1 | 3.5 | 6.7 | 9.2 | 11.1 | 12.2 | 87 |
| SpCond (µS/cm) | 3754 | 3815 | 6332 | 11730 | 15800 | 18779 | 20490 | 87 |
| pH field - sensor TC | 6.7 | 6.9 | 7.1 | 7.4 | 7.6 | 7.7 | 7.8 | 85 |
| Temperature (Celsius) | 10.7 | 10.9 | 11.5 | 14.1 | 16.2 | 17.6 | 18.6 | 87 |
| Turbidity (NTU) | 2.0 | 2.5 | 3.4 | 5.6 | 14.7 | 25.0 | 32.8 | 58 |
| Redox (mV) | 263 | 268 | 309 | 323 | 367 | 377 | 381 | 69 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 1.0 | 3.0 | 7.2 | 9.6 | 14.6 | 55 |
| Nitrite and Nitrate as N µg/L^ | 1.5 | 4.0 | 7.0 | 14.0 | 22.0 | 26.0 | 32.5 | 71 |
| Nitrate as N µg/L^ | 13.7 | 16.8 | 18.4 | 22.5 | 31.6 | 34.3 | 35.3 | 18 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 3.0 | 4.0 | 89 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 1.0 | 2.4 | 3.2 | 4.0 | 89 |
| TSS (mg/L) | 2.0 | 3.9 | 4.9 | 6.9 | 11.5 | 14.0 | 15.4 | 44 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Winter interim DGVs for Aquatic Ecosystems for Surface waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 9.8 | 9.9 | 10.0 | 10.9 | 12.8 | 13.4 | 14.2 | 83 |
| Dissolved Oxygen (%) | 88.1 | 89.2 | 95.3 | 99.8 | 112.9 | 122.8 | 128.0 | 83 |
| Salinity (PPT) | 2.0 | 3.2 | 3.8 | 5.7 | 9.6 | 10.5 | 11.7 | 83 |
| SpCond (µS/cm) | 3769 | 5860 | 6868 | 10076 | 16341 | 17789 | 19620 | 83 |
| pH field - sensor TC | 6.9 | 7.0 | 7.0 | 7.1 | 7.5 | 7.6 | 7.9 | 83 |
| Temperature (Celsius) | 8.5 | 8.6 | 8.7 | 9.8 | 10.1 | 10.5 | 10.7 | 83 |
| Turbidity (NTU) | 0.7 | 0.9 | 1.0 | 4.0 | 9.8 | 16.8 | 17.9 | 47 |
| Redox (mV) | 303 | 312 | 315 | 328 | 337 | 342 | 345 | 62 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 2.0 | 5.0 | 12.4 | 20.4 | 26.6 | 69 |
| Nitrite and Nitrate as N µg/L^ | 5.6 | 7.1 | 11.0 | 39.5 | 65.0 | 76.5 | 82.9 | 72 |
| Nitrate as N µg/L^ | | | | | ND | | | |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 72 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 4.5 | 72 |
| TSS (mg/L) | 2.0 | 2.0 | 2.9 | 6.9 | 9.0 | 13.2 | 15.4 | 40 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Spring interim DGVs for Aquatic Ecosystems for Surface waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 8.9 | 9.0 | 9.2 | 9.9 | 10.7 | 10.9 | 11.3 | 96 |
| Dissolved Oxygen (%) | 90.9 | 94.3 | 95.8 | 99.4 | 102.7 | 104.4 | 109.3 | 95 |
| Salinity (PPT) | 5.6 | 6.0 | 7.1 | 8.1 | 10.2 | 10.9 | 11.6 | 97 |
| SpCond (µS/cm) | 9848 | 10504 | 12402 | 14053 | 17310 | 18459 | 19555 | 97 |
| pH field - sensor TC | 6.8 | 7.0 | 7.1 | 7.4 | 7.6 | 7.6 | 7.6 | 97 |
| Temperature (Celsius) | 10.4 | 10.6 | 11.0 | 13.1 | 15.2 | 15.7 | 16.0 | 97 |
| Turbidity (NTU) | 1.1 | 1.4 | 2.1 | 4.5 | 15.2 | 24.3 | 45.5 | 56 |
| Redox (mV) | 270 | 271 | 277 | 335 | 402 | 429 | 438 | 66 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 4.0 | 4.0 | 66 |
| Nitrite and Nitrate as N µg/L^ | 8.0 | 11.2 | 13.2 | 22.0 | 27.8 | 30.7 | 37.4 | 32 |
| Nitrate as N µg/L^ | 8.0 | 10.0 | 11.0 | 19.0 | 27.0 | 30.0 | 36.0 | 46 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 3.0 | 3.0 | 78 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 4.0 | 78 |
| TSS (mg/L) | 0.5 | 1.2 | 3.6 | 9.4 | 12.0 | 13.8 | 15.4 | 53 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Annual interim DGVs for Aquatic Ecosystems for Halocline (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 6.9 | 7.1 | 7.5 | 8.3 | 8.8 | 9.2 | 9.5 | 201 |
| Dissolved Oxygen (%) | 77.8 | 80.6 | 83.8 | 89.9 | 94.5 | 96.2 | 99.5 | 205 |
| Salinity (PPT) | 13.6 | 16.0 | 18.0 | 20.7 | 22.4 | 23.3 | 23.7 | 207 |
| SpCond (µS/cm) | 22476 | 26244 | 29206 | 32795 | 35501 | 36702 | 37165 | 206 |
| pH field - sensor TC | 7.0 | 7.1 | 7.2 | 7.5 | 7.7 | 7.8 | 7.8 | 207 |
| Temperature (Celsius) | 10.7 | 11.1 | 11.5 | 13.2 | 15.7 | 16.7 | 17.4 | 207 |
| Turbidity (NTU) | 0.8 | 1.5 | 2.0 | 4.3 | 12.8 | 15.2 | 17.3 | 156 |
| Redox (mV) | 267 | 276 | 295 | 334 | 377 | 393 | 426 | 143 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 3.0 | 5.0 | 9.0 | 11.0 | 14.0 | 273 |
| Nitrite and Nitrate as N µg/L^ | 8.0 | 13.0 | 17.0 | 35.0 | 54.8 | 79.0 | 88.4 | 187 |
| Nitrate as N µg/L^ | 9.0 | 11.1 | 18.2 | 29.5 | 46.6 | 52.0 | 56.9 | 92 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 3.0 | 3.0 | 279 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 3.0 | 4.0 | 279 |
| TSS (mg/L) | 4.8 | 6.3 | 10.1 | 14.3 | 18.9 | 21.8 | 26.1 | 185 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Summer interim DGVs for Aquatic Ecosystems for Halocline (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 6.4 | 6.8 | 7.0 | 7.6 | 8.3 | 8.6 | 8.8 | 57 |
| Dissolved Oxygen (%) | 76.6 | 78.9 | 82.4 | 87.9 | 92.9 | 94.9 | 98.5 | 61 |
| Salinity (PPT) | 11.9 | 16.0 | 18.3 | 20.7 | 22.9 | 23.4 | 23.8 | 61 |
| SpCond (µS/cm) | 20000 | 26172 | 29400 | 33000 | 35900 | 36972 | 37458 | 61 |
| pH field - sensor TC | 7.2 | 7.2 | 7.2 | 7.6 | 7.8 | 7.8 | 7.8 | 61 |
| Temperature (Celsius) | 13.0 | 13.6 | 14.3 | 15.8 | 17.1 | 17.7 | 18.7 | 61 |
| Turbidity (NTU) | 1.4 | 1.9 | 2.4 | 9.5 | 15.2 | 16.8 | 20.8 | 47 |
| Redox (mV) | 261 | 263 | 285 | 317 | 350 | 389 | 423 | 46 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 2.3 | 3.0 | 4.0 | 9.0 | 9.0 | 10.0 | 64 |
| Nitrite and Nitrate as N µg/L^ | 8.0 | 8.7 | 12.2 | 29.5 | 40.0 | 43.6 | 49.6 | 28 |
| Nitrate as N µg/L^ | 7.8 | 8.6 | 10.2 | 18.0 | 28.0 | 29.0 | 29.0 | 37 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 3.0 | 65 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 3.0 | 65 |
| TSS (mg/L) | 6.2 | 7.1 | 11.2 | 16.0 | 20.8 | 23.7 | 26.4 | 52 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Autumn interim DGVs for Aquatic Ecosystems for Halocline (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 6.9 | 7.2 | 7.6 | 8.2 | 8.8 | 9.0 | 9.1 | 46 |
| Dissolved Oxygen (%) | 79.7 | 81.0 | 84.6 | 93.1 | 95.9 | 97.3 | 102.5 | 46 |
| Salinity (PPT) | 16.2 | 16.3 | 17.7 | 20.7 | 22.2 | 22.6 | 22.9 | 47 |
| SpCond (µS/cm) | 26432 | 26700 | 28260 | 32600 | 34918 | 36000 | 36573 | 47 |
| pH field - sensor TC | 6.9 | 7.0 | 7.1 | 7.6 | 7.7 | 7.8 | 7.9 | 47 |
| Temperature (Celsius) | 12.3 | 12.4 | 13.1 | 14.7 | 15.7 | 16.1 | 16.9 | 47 |
| Turbidity (NTU) | 1.1 | 2.1 | 2.8 | 4.6 | 11.8 | 16.0 | 17.4 | 40 |
| Redox (mV) | 273 | 278 | 319 | 333 | 385 | 389 | 391 | 33 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 1.0 | 5.0 | 10.0 | 12.0 | 14.0 | 78 |
| Nitrite and Nitrate as N µg/L^ | 11.3 | 13.6 | 18.6 | 28.0 | 44.0 | 46.7 | 57.4 | 64 |
| Nitrate as N µg/L^ | 24.8 | 26.6 | 28.4 | 34.0 | 39.0 | 40.6 | 43.8 | 17 |
| Nitrite as N µg/L^ | 1.0 | 2.0 | 2.0 | 2.0 | 3.0 | 3.0 | 5.0 | 81 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 1.0 | 3.0 | 3.0 | 4.0 | 81 |
| TSS (mg/L) | 6.2 | 10.1 | 11.6 | 14.0 | 18.4 | 22.0 | 29.3 | 43 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Winter interim DGVs for Aquatic Ecosystems for Halocline (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 7.3 | 7.6 | 7.9 | 8.7 | 9.0 | 9.2 | 9.3 | 40 |
| Dissolved Oxygen (%) | 78.5 | 81.1 | 84.7 | 90.7 | 93.4 | 94.1 | 95.5 | 40 |
| Salinity (PPT) | 18.0 | 19.0 | 19.4 | 20.9 | 22.2 | 23.6 | 24.1 | 40 |
| SpCond (µS/cm) | 29025 | 30519 | 31200 | 33373 | 35200 | 36983 | 37800 | 39 |
| pH field - sensor TC | 7.1 | 7.1 | 7.2 | 7.3 | 7.5 | 7.6 | 7.7 | 40 |
| Temperature (Celsius) | 10.5 | 10.5 | 10.6 | 11.3 | 11.9 | 12.4 | 12.6 | 40 |
| Turbidity (NTU) | 0.2 | 0.4 | 1.6 | 4.2 | 6.9 | 10.5 | 12.7 | 26 |
| Redox (mV) | 307 | 321 | 328 | 335 | 356 | 360 | 361 | 29 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 4.0 | 8.0 | 13.2 | 20.0 | 32.4 | 70 |
| Nitrite and Nitrate as N µg/L^ | 10.3 | 14.0 | 16.8 | 47.5 | 83.2 | 90.1 | 93.1 | 70 |
| Nitrate as N µg/L^ | | | | | ND | | | |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 70 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 3.0 | 5.6 | 70 |
| TSS (mg/L) | 4.6 | 5.4 | 8.4 | 15.0 | 18.2 | 19.4 | 21.2 | 38 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Spring interim DGVs for Aquatic Ecosystems for Halocline (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 7.3 | 7.5 | 8.1 | 8.6 | 9.2 | 9.6 | 9.8 | 58 |
| Dissolved Oxygen (%) | 78.7 | 81.2 | 85.4 | 90.5 | 94.7 | 97.4 | 100.8 | 58 |
| Salinity (PPT) | 10.9 | 14.2 | 16.8 | 20.0 | 22.4 | 22.9 | 23.5 | 59 |
| SpCond (µS/cm) | 18430 | 23520 | 27352 | 32100 | 35355 | 36251 | 37137 | 59 |
| pH field - sensor TC | 7.2 | 7.2 | 7.3 | 7.4 | 7.6 | 7.7 | 7.7 | 59 |
| Temperature (Celsius) | 10.8 | 10.9 | 11.2 | 12.1 | 13.2 | 13.6 | 14.4 | 59 |
| Turbidity (NTU) | 0.8 | 1.4 | 1.5 | 3.8 | 8.5 | 13.4 | 15.1 | 43 |
| Redox (mV) | 273 | 275 | 282 | 342 | 420 | 437 | 447 | 35 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 2.0 | 4.0 | 8.0 | 8.0 | 9.0 | 61 |
| Nitrite and Nitrate as N µg/L^ | 9.2 | 15.2 | 17.8 | 32.0 | 49.0 | 60.4 | 75.2 | 25 |
| Nitrate as N µg/L^ | 24.4 | 27.7 | 33.2 | 44.5 | 52.6 | 58.6 | 64.1 | 38 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 3.0 | 3.0 | 63 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 3.0 | 4.8 | 63 |
| TSS (mg/L) | 4.0 | 6.0 | 8.3 | 13.4 | 18.0 | 20.0 | 20.5 | 52 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Annual interim DGVs for Aquatic Ecosystems for bottom waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 3.0 | 3.3 | 3.6 | 4.3 | 5.2 | 5.7 | 6.4 | 378 |
| Dissolved Oxygen (%) | 34.9 | 38.0 | 41.9 | 49.9 | 60.1 | 65.9 | 74.9 | 384 |
| Salinity (PPT) | 26.2 | 27.3 | 28.5 | 30.3 | 31.1 | 31.7 | 32.0 | 390 |
| SpCond (µS/cm) | 40750 | 42344 | 44102 | 46572 | 47694 | 48425 | 48916 | 391 |
| pH field - sensor TC | 7.2 | 7.2 | 7.3 | 7.5 | 7.6 | 7.8 | 7.8 | 389 |
| Temperature (Celsius) | 12.7 | 12.8 | 13.1 | 13.7 | 14.2 | 14.5 | 14.7 | 391 |
| Turbidity (NTU) | 0.7 | 1.3 | 2.6 | 6.5 | 14.2 | 15.7 | 17.3 | 304 |
| Redox (mV) | 267 | 279 | 290 | 332 | 376 | 392 | 423 | 292 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 3.0 | 5.0 | 9.0 | 13.0 | 15.0 | 18.0 | 283 |
| Nitrite and Nitrate as N µg/L^ | 1.0 | 5.3 | 22.6 | 52.5 | 99.4 | 115.7 | 127.8 | 174 |
| Nitrate as N µg/L^ | 7.0 | 9.0 | 14.4 | 34.0 | 61.2 | 70.6 | 79.0 | 108 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 3.0 | 3.0 | 285 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 2.0 | 3.0 | 5.0 | 7.8 | 10.0 | 283 |
| TSS (mg/L) | 8.1 | 10.6 | 17.4 | 23.7 | 29.0 | 34.0 | 38.8 | 186 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Summer interim DGVs for Aquatic Ecosystems for bottom waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 3.2 | 3.4 | 3.7 | 4.5 | 5.3 | 5.8 | 6.8 | 111 |
| Dissolved Oxygen (%) | 36.1 | 39.0 | 42.2 | 52.2 | 61.1 | 66.4 | 77.0 | 118 |
| Salinity (PPT) | 24.5 | 25.9 | 27.2 | 29.5 | 30.8 | 31.4 | 32.0 | 117 |
| SpCond (µS/cm) | 38635 | 40310 | 42258 | 45438 | 47200 | 47977 | 48872 | 118 |
| pH field - sensor TC | 7.1 | 7.2 | 7.2 | 7.4 | 7.7 | 7.8 | 7.9 | 118 |
| Temperature (Celsius) | 12.7 | 12.7 | 12.9 | 13.6 | 14.1 | 14.5 | 14.8 | 118 |
| Turbidity (NTU) | 0.7 | 1.3 | 2.4 | 11.0 | 15.1 | 16.4 | 17.6 | 99 |
| Redox (mV) | 263 | 269 | 285 | 324 | 364 | 391 | 434 | 94 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 5.0 | 5.0 | 6.0 | 8.0 | 11.0 | 12.0 | 13.0 | 81 |
| Nitrite and Nitrate as N µg/L^ | 1.0 | 1.0 | 1.0 | 36.0 | 56.0 | 72.6 | 84.6 | 35 |
| Nitrate as N µg/L^ | 3.2 | 6.3 | 8.6 | 18.0 | 31.0 | 38.1 | 62.6 | 44 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 2.0 | 2.0 | 2.0 | 3.0 | 4.0 | 81 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 2.0 | 2.0 | 3.0 | 4.0 | 6.0 | 81 |
| TSS (mg/L) | 8.8 | 10.0 | 14.0 | 25.9 | 31.6 | 35.3 | 40.7 | 54 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Autumn interim DGVs for Aquatic Ecosystems for bottom waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 3.3 | 3.4 | 3.7 | 4.2 | 5.0 | 5.3 | 5.7 | 84 |
| Dissolved Oxygen (%) | 38.8 | 41.3 | 43.2 | 49.0 | 58.1 | 61.5 | 66.1 | 84 |
| Salinity (PPT) | 26.0 | 27.0 | 27.9 | 29.9 | 30.9 | 31.2 | 31.4 | 88 |
| SpCond (µS/cm) | 40640 | 42010 | 43219 | 46078 | 47487 | 47770 | 48275 | 88 |
| pH field - sensor TC | 7.3 | 7.4 | 7.4 | 7.5 | 7.7 | 7.8 | 7.9 | 86 |
| Temperature (Celsius) | 13.5 | 13.5 | 13.6 | 14.1 | 14.6 | 14.7 | 14.9 | 88 |
| Turbidity (NTU) | 2.7 | 2.7 | 2.9 | 5.0 | 12.5 | 14.0 | 17.1 | 79 |
| Redox (mV) | 276 | 281 | 313 | 332 | 386 | 391 | 395 | 69 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 1.0 | 3.6 | 9.0 | 14.0 | 15.0 | 15.6 | 69 |
| Nitrite and Nitrate as N µg/L^ | 2.1 | 22.0 | 33.2 | 46.5 | 69.8 | 100.7 | 115.3 | 52 |
| Nitrate as N µg/L^ | 26.7 | 32.2 | 42.2 | 50.5 | 67.6 | 72.9 | 75.6 | 18 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 2.0 | 2.0 | 2.0 | 3.0 | 3.0 | 70 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 3.0 | 4.0 | 4.0 | 4.0 | 70 |
| TSS (mg/L) | 12.1 | 14.9 | 18.0 | 22.9 | 27.8 | 29.5 | 31.9 | 44 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected.

## Winter interim DGVs for Aquatic Ecosystems for bottom waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 2.8 | 2.9 | 3.4 | 4.0 | 5.1 | 5.8 | 6.3 | 86 |
| Dissolved Oxygen (%) | 32.7 | 34.2 | 39.8 | 47.7 | 60.1 | 66.5 | 72.7 | 85 |
| Salinity (PPT) | 28.2 | 28.9 | 29.7 | 30.9 | 31.5 | 31.9 | 32.0 | 87 |
| SpCond (µS/cm) | 43730 | 44584 | 45720 | 47400 | 48179 | 48706 | 48900 | 87 |
| pH field - sensor TC | 7.2 | 7.2 | 7.3 | 7.4 | 7.6 | 7.7 | 7.8 | 87 |
| Temperature (Celsius) | 12.8 | 13.1 | 13.3 | 13.8 | 14.3 | 14.4 | 14.5 | 87 |
| Turbidity (NTU) | 0.4 | 0.6 | 1.2 | 2.9 | 5.1 | 14.2 | 14.6 | 50 |
| Redox (mV) | 296 | 317 | 325 | 335 | 361 | 364 | 367 | 64 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 2.0 | 3.0 | 5.0 | 11.0 | 16.0 | 19.0 | 34.7 | 62 |
| Nitrite and Nitrate as N µg/L^ | 5.2 | 16.1 | 27.0 | 73.0 | 115.8 | 130.4 | 152.0 | 62 |
| Nitrate as N µg/L^ | | | | | ND | | | |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 62 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 1.0 | 6.0 | 9.0 | 11.0 | 12.0 | 61 |
| TSS (mg/L) | 8.4 | 16.2 | 17.9 | 22.7 | 24.9 | 27.4 | 49.2 | 38 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected

## Spring interim DGVs for Aquatic Ecosystems for bottom waters (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 2.9 | 3.3 | 3.6 | 4.3 | 5.3 | 6.0 | 6.7 | 97 |
| Dissolved Oxygen (%) | 33.7 | 37.6 | 42.0 | 49.5 | 60.3 | 68.5 | 75.6 | 97 |
| Salinity (PPT) | 28.5 | 28.7 | 29.6 | 30.5 | 31.1 | 32.1 | 32.5 | 98 |
| SpCond (µS/cm) | 44050 | 44300 | 45595 | 46793 | 47609 | 48961 | 49486 | 98 |
| pH field - sensor TC | 7.2 | 7.3 | 7.3 | 7.4 | 7.6 | 7.6 | 7.7 | 98 |
| Temperature (Celsius) | 12.6 | 12.7 | 12.9 | 13.3 | 13.7 | 13.8 | 14.1 | 98 |
| Turbidity (NTU) | 0.9 | 1.7 | 2.9 | 8.7 | 14.5 | 16.0 | 19.1 | 76 |
| Redox (mV) | 267 | 270 | 278 | 347 | 394 | 426 | 433 | 65 |
| Chlorophyll a (µg/L)* | | | | | ND | | | |
| TAN as N (µg/L)^ | 1.0 | 3.0 | 5.0 | 7.0 | 13.0 | 14.0 | 15.0 | 71 |
| Nitrite and Nitrate as N µg/L^ | 18.0 | 20.8 | 32.6 | 63.0 | 94.4 | 106.2 | 118.2 | 25 |
| Nitrate as N µg/L^ | 18.3 | 22.5 | 30.0 | 42.0 | 66.0 | 81.5 | 88.8 | 46 |
| Nitrite as N µg/L^ | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 3.0 | 3.0 | 72 |
| Nitrogen (Total) as N µg/L | | | | | ND | | | |
| Phosphorus (Total) as P µg/L | | | | | ND | | | |
| DRP as P µg/L^ | 1.0 | 1.0 | 2.0 | 3.0 | 5.0 | 7.0 | 10.0 | 71 |
| TSS (mg/L) | 7.2 | 9.4 | 18.4 | 24.4 | 31.3 | 36.3 | 38.6 | 50 |

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen ($NH_3$ and $NH_4^+$), DRP= Dissolved Reactive Phosphorous, ^Harbour wide data, ND = No data collected

## Annual interim DGVs for Aquatic Ecosystems for 6 to 10 metres (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 5.5 | 6.2 | 6.9 | 8.2 | 9.2 | 9.6 | 10.0 | 2762 |
| Dissolved Oxygen (%) | 63.6 | 70.2 | 77.8 | 88.9 | 95.4 | 97.6 | 100.0 | 2808 |
| Salinity (PPT) | 10.5 | 12.8 | 15.8 | 22.1 | 26.4 | 27.8 | 28.6 | 2840 |
| SpCond (µS/cm) | 17784 | 21300 | 25900 | 35145 | 41100 | 43105 | 44158 | 2837 |
| pH field - sensor TC | 7.0 | 7.1 | 7.2 | 7.5 | 7.6 | 7.7 | 7.8 | 2828 |
| Temperature (Celsius) | 10.5 | 10.9 | 11.5 | 13.0 | 15.0 | 15.6 | 16.3 | 2843 |
| Turbidity (NTU) | 0.0 | 0.5 | 1.9 | 4.5 | 13.5 | 15.6 | 17.1 | 2173 |
| Redox (mV) | 271.55 | 278 | 296 | 335 | 377 | 392 | 418 | 2432 |

Consider halocline and bottom waters for nutrient interim DGVs.

### Annual interim DGVs for Aquatic Ecosystems for 11 to 15 metres (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 3.8 | 4.2 | 4.6 | 5.8 | 6.9 | 7.5 | 7.9 | 2380 |
| Dissolved Oxygen (%) | 43.9 | 47.9 | 53.1 | 65.8 | 77.9 | 83.6 | 87.0 | 2434 |
| Salinity (PPT) | 24.0 | 25.1 | 26.5 | 28.6 | 29.8 | 30.3 | 30.9 | 2462 |
| SpCond (µS/cm) | 37820 | 39400 | 41300 | 44124 | 45800 | 46532 | 47380 | 2458 |
| pH field - sensor TC | 7.2 | 7.3 | 7.3 | 7.4 | 7.6 | 7.7 | 7.8 | 2457 |
| Temperature (Celsius) | 12.0 | 12.3 | 12.6 | 13.4 | 14.1 | 14.5 | 14.7 | 2470 |
| Turbidity (NTU) | 0.3 | 0.6 | 1.9 | 4.4 | 13.6 | 15.2 | 16.3 | 1882 |
| Redox (mV) | 274 | 281 | 295 | 334 | 379 | 393 | 425 | 2082 |

Consider halocline and bottom waters for nutrient interim DGVs.

### Annual interim DGVs for Aquatic Ecosystems for 16 to 20 metres (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 3.1 | 3.3 | 3.6 | 4.2 | 4.9 | 5.4 | 5.7 | 1491 |
| Dissolved Oxygen (%) | 35.5 | 37.7 | 41.1 | 48.4 | 56.2 | 61.8 | 65.6 | 1525 |
| Salinity (PPT) | 26.1 | 27.6 | 28.9 | 30.0 | 30.7 | 31.1 | 32.0 | 1570 |
| SpCond (µS/cm) | 40775 | 42805 | 44600 | 46100 | 47029 | 47700 | 48861 | 1556 |
| pH field - sensor TC | 7.2 | 7.2 | 7.3 | 7.4 | 7.6 | 7.7 | 7.8 | 1572 |
| Temperature (Celsius) | 12.7 | 12.8 | 13.1 | 13.6 | 14.1 | 14.3 | 14.5 | 1574 |
| Turbidity (NTU) | 0.4 | 0.8 | 2.3 | 4.5 | 13.5 | 15.2 | 16.6 | 1205 |
| Redox (mV) | 274 | 283 | 298 | 335 | 380 | 394 | 428 | 1266 |

Consider halocline and bottom waters for nutrient interim DGVs.

### Annual interim DGVs for Aquatic Ecosystems for 21 to 25 metres (Shaded)

| Parameter | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen (mg/L) | 2.9 | 3.0 | 3.2 | 3.7 | 4.2 | 4.5 | 4.8 | 1007 |
| Dissolved Oxygen (%) | 33.5 | 34.9 | 37.0 | 43.1 | 48.2 | 52.2 | 55.3 | 1029 |
| Salinity (PPT) | 26.4 | 28.2 | 29.5 | 30.4 | 31.0 | 31.4 | 31.9 | 1054 |
| SpCond (µS/cm) | 41100 | 43618 | 45500 | 46732 | 47500 | 48100 | 48700 | 1049 |
| pH field - sensor TC | 7.2 | 7.2 | 7.3 | 7.4 | 7.6 | 7.7 | 7.8 | 1063 |
| Temperature (Celsius) | 12.8 | 13.0 | 13.1 | 13.7 | 14.1 | 14.3 | 14.6 | 1059 |
| Turbidity (NTU) | 0.5 | 0.9 | 2.1 | 3.7 | 13.1 | 15.0 | 16.4 | 791 |
| Redox (mV) | 272 | 281 | 296 | 336 | 380 | 398 | 434 | 826 |

Consider halocline and bottom waters for nutrient interim DGVs.

## Summer interim DGVs for Aquatic Ecosystems for depth ranges (Shaded)

| Parameter | Depth Range | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|---|
| DO (mg/L) | 6-10m | 4.9 | 5.4 | 6.2 | 7.5 | 8.5 | 8.8 | 9.1 | 777 |
| DO (%) | 6-10m | 57.7 | 62.9 | 70.5 | 85.0 | 93.4 | 96.2 | 97.7 | 830 |
| DO (mg/L) | 11-15m | 3.8 | 4.1 | 4.4 | 5.4 | 6.6 | 7.2 | 7.5 | 644 |
| DO (%) | 11-15m | 41.9 | 45.6 | 49.8 | 60.0 | 74.0 | 80.0 | 84.2 | 699 |
| DO (mg/L) | 16-20m | 3.0 | 3.3 | 3.5 | 4.1 | 4.9 | 5.2 | 5.6 | 426 |
| DO (%) | 16-20m | 33.8 | 36.1 | 39.3 | 46.8 | 54.8 | 59.4 | 62.7 | 459 |
| DO (mg/L) | 21-25m | 2.9 | 3.1 | 3.2 | 3.9 | 4.3 | 4.6 | 4.8 | 275 |
| DO (%) | 21-25m | 32.9 | 34.5 | 37.0 | 43.8 | 48.7 | 51.9 | 54.0 | 299 |

DO = Dissolved Oxygen

## Autumn interim DGVs for Aquatic Ecosystems for depth ranges (Shaded)

| Parameter | Depth Range | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|---|
| DO (mg/L) | 6-10m | 5.0 | 5.7 | 6.6 | 8.0 | 9.0 | 9.4 | 9.8 | 559 |
| DO (%) | 6-10m | 60.5 | 68.6 | 75.6 | 87.6 | 95.3 | 98.4 | 101.6 | 557 |
| DO (mg/L) | 11-15m | 3.3 | 3.6 | 4.3 | 5.2 | 6.1 | 6.7 | 7.4 | 483 |
| DO (%) | 11-15m | 39.2 | 43.7 | 50.1 | 60.4 | 71.1 | 77.8 | 84.5 | 482 |
| DO (mg/L) | 16-20m | 3.1 | 3.2 | 3.3 | 4.1 | 4.6 | 4.8 | 5.2 | 326 |
| DO (%) | 16-20m | 36.2 | 37.3 | 39.2 | 47.2 | 53.3 | 55.7 | 61.2 | 326 |
| DO (mg/L) | 21-25m | 3.0 | 3.1 | 3.3 | 3.7 | 4.3 | 4.5 | 4.9 | 222 |
| DO (%) | 21-25m | 35.8 | 36.5 | 39.2 | 43.9 | 49.6 | 51.5 | 58.1 | 221 |

DO = Dissolved Oxygen

### Winter interim DGVs for Aquatic Ecosystems for depth ranges (Shaded)

| Parameter | Depth Range | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|---|
| DO (mg/L) | 6-10m | 6.2 | 6.7 | 7.3 | 8.5 | 9.5 | 9.9 | 10.3 | 711 |
| DO (%) | 6-10m | 69.8 | 74.8 | 80.9 | 90.2 | 95.4 | 98.1 | 99.8 | 705 |
| DO (mg/L) | 11-15m | 3.9 | 4.3 | 4.8 | 6.1 | 7.2 | 7.7 | 8.0 | 639 |
| DO (%) | 11-15m | 44.9 | 49.8 | 55.4 | 69.1 | 80.3 | 84.2 | 86.6 | 639 |
| DO (mg/L) | 16-20m | 3.0 | 3.2 | 3.4 | 4.0 | 4.8 | 5.4 | 5.6 | 367 |
| DO (%) | 16-20m | 34.8 | 37.4 | 40.4 | 47.0 | 56.1 | 62.9 | 65.7 | 368 |
| DO (mg/L) | 21-25m | 2.8 | 2.9 | 3.0 | 3.4 | 4.1 | 4.4 | 4.9 | 236 |
| DO (%) | 21-25m | 32.9 | 33.8 | 35.3 | 40.3 | 47.2 | 51.7 | 56.9 | 236 |

DO = Dissolved Oxygen

### Spring interim DGVs for Aquatic Ecosystems for depth ranges (Shaded)

| Parameter | Depth Range | 5th %ile | 10th %ile | 20th %ile | Median | 80th %ile | 90th %ile | 95th %ile | Sample Number |
|---|---|---|---|---|---|---|---|---|---|
| DO (mg/L) | 6-10m | 6.8 | 7.1 | 7.6 | 8.8 | 9.5 | 9.9 | 10.4 | 715 |
| DO (%) | 6-10m | 76.0 | 78.6 | 83.0 | 91.9 | 96.3 | 99.3 | 101.1 | 716 |
| DO (mg/L) | 11-15m | 4.4 | 4.8 | 5.3 | 6.3 | 7.3 | 7.9 | 8.2 | 614 |
| DO (%) | 11-15m | 50.9 | 55.1 | 60.5 | 71.6 | 81.6 | 86.4 | 89.9 | 614 |
| DO (mg/L) | 16-20m | 3.5 | 3.7 | 4.0 | 4.5 | 5.4 | 5.7 | 6.1 | 372 |
| DO (%) | 16-20m | 40.4 | 42.8 | 46.3 | 52.0 | 61.4 | 65.4 | 70.1 | 372 |
| DO (mg/L) | 21-25m | 2.9 | 3.1 | 3.3 | 3.8 | 4.2 | 4.4 | 4.7 | 274 |
| DO (%) | 21-25m | 34.2 | 35.6 | 38.0 | 43.9 | 47.8 | 52.0 | 55.2 | 273 |

DO = Dissolved Oxygen

# Appendix A – Summary of interim DGVs

| Surface | Physico-chemical indicators and interim default guideline values for aquatic ecosystems | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DO (mg/L) | | DO (% sat) | | Salinity | SpCond | pH | | Temp (°C) | | Turb | Redox | Chl a | TAN as N^ | $NO_x$ as N^ | $NO_3$ as N^ | $NO_2$ as N^ | Total N as N | Total P as P | DRP as P^ | TSS |
| | lower | upper | lower | upper | (PPT) | (µS/cm) | lower | upper | lower | upper | NTU | (mV) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (mg/L) |
| Annual | 9.0 | 10.7 | 96.0 | 104.4 | 10.6 | 17956 | 7.0 | 7.7 | 10.2 | 17.6 | 15.1 | 362 | ND | 6.0 | 36.2 | 23.0 | 2.0 | ND | ND | 2.0 | 12.1 |
| Summer | 8.4 | 9.7 | 96.9 | 107.8 | 12.1 | 20397 | 7.1 | 7.8 | 16.5 | 20.7 | 15.3 | 339 | ND | 5.0 | 14.0 | 10.0 | 2.0 | ND | ND | 2.0 | 17.0 |
| Autumn | 9.2 | 10.4 | 95.5 | 102.4 | 9.2 | 15800 | 7.1 | 7.6 | 11.5 | 16.2 | 14.7 | 367 | ND | 7.2 | 22.0 | 31.6 | 3.0 | ND | ND | 2.4 | 11.5 |
| Winter | 10.0 | 12.8 | 95.3 | 112.9 | 9.6 | 16341 | 7.0 | 7.5 | 8.7 | 10.1 | 9.8 | 337 | ND | 12.4 | 65.0 | ND | 2.0 | ND | ND | 2.0 | 9.0 |
| Spring | 9.2 | 10.7 | 95.8 | 102.7 | 10.2 | 17310 | 7.1 | 7.6 | 11.0 | 15.2 | 15.2 | 402 | ND | 3.0 | 27.8 | 27.0 | 2.0 | ND | ND | 2.0 | 12.0 |

NB: DO (dissolved oxygen), SPCond (Specific conductance), Turb (turbidity), Redox (Reduction / Oxidation potential), Chl a (Chlorophyll a – Lab analysis), TAN (Total Ammonia Nitrogen ($NH_3$ and $NH4^+$)), $NO_x$ (Nitrite and Nitrate), $NO_3$ (Nitrate), $NO_2$ (Nitrite), DRP (Dissolved reactive phosphorous), ND = No Data, ^Harbour wide data. Figures shown above are based on data collected from 04/05/1993 to 14/10/2009.

| Halocline | Physico-chemical indicators and interim default guideline values for aquatic ecosystems | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DO (mg/L) | | DO (% sat) | | Salinity | SpCond | pH | | Temp (°C) | | Turb | Redox | Chl a | TAN as N^ | $NO_x$ as N^ | $NO_3$ as N^ | $NO_2$ as N^ | Total N as N | Total P as P | DRP as P^ | TSS |
| | lower | upper | lower | upper | (PPT) | (µS/cm) | lower | upper | lower | upper | NTU | (mV) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (mg/L) |
| Annual | 7.5 | 8.8 | 83.8 | 94.5 | 22.4 | 35501 | 7.2 | 7.7 | 11.5 | 15.7 | 12.8 | 377 | ND | 9.0 | 54.8 | 46.6 | 3.0 | ND | ND | 3.0 | 18.9 |
| Summer | 7.0 | 8.3 | 82.4 | 92.9 | 22.9 | 35900 | 7.2 | 7.8 | 14.3 | 17.1 | 15.2 | 350 | ND | 9.0 | 40.0 | 28.0 | 2.0 | ND | ND | 2.0 | 20.8 |
| Autumn | 7.6 | 8.8 | 84.6 | 95.9 | 22.2 | 34918 | 7.1 | 7.7 | 13.1 | 15.7 | 11.8 | 385 | ND | 10.0 | 44.0 | 39.0 | 3.0 | ND | ND | 3.0 | 18.4 |
| Winter | 7.9 | 9.0 | 84.7 | 93.4 | 22.2 | 35200 | 7.2 | 7.5 | 10.6 | 11.9 | 6.9 | 356 | ND | 13.2 | 83.2 | ND | 2.0 | ND | ND | 3.0 | 18.2 |
| Spring | 8.1 | 9.2 | 85.4 | 94.7 | 22.4 | 35355 | 7.3 | 7.6 | 11.2 | 13.2 | 8.5 | 420 | ND | 8.0 | 49.0 | 52.6 | 3.0 | ND | ND | 3.0 | 18.0 |

NB: DO (dissolved oxygen), SPCond (Specific conductance), Turb (turbidity), Redox (Reduction / Oxidation potential), Chl a (Chlorophyll a – Lab analysis), TAN (Total Ammonia Nitrogen ($NH_3$ and $NH4^+$)), $NO_x$ (Nitrite and Nitrate), $NO_3$ (Nitrate), $NO_2$ (Nitrite), DRP (Dissolved reactive phosphorous), ND = No Data, ^Harbour wide data. Figures shown above are based on data collected from 04/05/1993 to 14/10/2009.

| Bottom | Physico-chemical indicators and interim default guideline values for aquatic ecosystems | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DO (mg/L) | | DO (% sat) | | Salinity | SpCond | pH | | Temp (°C) | | Turb | Redox | Chl a | TAN as N^ | $NO_x$ as N^ | $NO_3$ as N^ | $NO_2$ as N^ | Total N as N | Total P as P | DRP as P^ | TSS |
| | lower | upper | lower | upper | (PPT) | (µS/cm) | lower | upper | lower | upper | NTU | (mV) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (µg/L) | (mg/L) |
| Annual | 3.6 | 5.2 | 41.9 | 60.1 | 31.1 | 47694 | 7.3 | 7.6 | 13.1 | 14.2 | 14.2 | 376 | ND | 13.0 | 99.4 | 61.2 | 2.0 | ND | ND | 5.0 | 29.0 |
| Summer | 3.7 | 5.3 | 42.2 | 61.1 | 30.8 | 47200 | 7.2 | 7.7 | 12.9 | 14.1 | 15.1 | 364 | ND | 11.0 | 56.0 | 31.0 | 2.0 | ND | ND | 3.0 | 31.6 |
| Autumn | 3.7 | 5.0 | 43.2 | 58.1 | 30.9 | 47487 | 7.4 | 7.7 | 13.6 | 14.6 | 12.5 | 386 | ND | 14.0 | 69.8 | 67.6 | 2.0 | ND | ND | 4.0 | 27.8 |
| Winter | 3.4 | 5.1 | 39.8 | 60.1 | 31.5 | 48179 | 7.3 | 7.6 | 13.3 | 14.3 | 5.1 | 361 | ND | 16.0 | 115.8 | ND | 2.0 | ND | ND | 9.0 | 24.9 |
| Spring | 3.6 | 5.3 | 42.0 | 60.3 | 31.1 | 47609 | 7.3 | 7.6 | 12.9 | 13.7 | 14.5 | 394 | ND | 13.0 | 94.4 | 66.0 | 3.0 | ND | ND | 5.0 | 31.1 |

NB: DO (dissolved oxygen), SPCond (Specific conductance), Turb (turbidity), Redox (Reduction / Oxidation potential), Chl a (Chlorophyll a – Lab analysis), TAN (Total Ammonia Nitrogen ($NH_3$ and $NH4^+$)), $NO_x$ (Nitrite and Nitrate), $NO_3$ (Nitrate), $NO_2$ (Nitrite), DRP (Dissolved reactive phosphorous), ND = No Data, ^Harbour wide data. Figures shown above are based on data collected from 04/05/1993 to 14/10/2009.

| Depth Ranges (Annual) | Physico-chemical indicators and interim default guideline values for aquatic ecosystems | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DO (mg/L) | | DO (% sat) | | Salinity | SpCond | pH | | Temp (°C) | | Turb | Redox |
| | lower | upper | lower | upper | (PPT) | (µS/cm) | lower | upper | lower | upper | NTU | (mV) |
| 6-10m | 6.9 | 9.2 | 77.8 | 95.4 | 26.4 | 41100 | 7.2 | 7.6 | 11.5 | 15 | 13.5 | 377 |
| 11-15m | 4.6 | 6.9 | 53.1 | 77.9 | 29.8 | 45800 | 7.3 | 7.6 | 12.6 | 14.1 | 13.6 | 379 |
| 16-20m | 3.6 | 4.9 | 41.1 | 56.2 | 30.7 | 47029 | 7.3 | 7.6 | 13.1 | 14.1 | 13.5 | 380 |
| 21-25m | 3.2 | 4.2 | 37.0 | 48.2 | 31.0 | 47500 | 7.3 | 7.6 | 13.1 | 14.1 | 13.1 | 380 |

NB: DO (dissolved oxygen), SPCond (Specific conductance), Turb (turbidity), Redox (Reduction / Oxidation potential).
Figures shown above are based on data collected from 04/05/1993 to 14/10/2009.

| Summer | Physico-chemical indicators and interim default guideline values for aquatic ecosystems | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DO (mg/L) | | DO (% sat) | | Salinity | SpCond | pH | | Temp (°C) | | Turb | Redox |
| | lower | upper | lower | upper | (PPT) | (µS/cm) | lower | upper | lower | upper | NTU | (mV) |
| 6 – 10 m | 6.2 | 8.5 | 70.5 | 93.4 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 11 – 15 m | 4.4 | 6.6 | 49.8 | 74.0 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16 – 20 m | 3.5 | 4.9 | 39.3 | 54.8 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 21 – 25 m | 3.2 | 4.3 | 37.0 | 48.7 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

NB: DO (dissolved oxygen), SPCond (Specific conductance), Turb (turbidity), Redox (Reduction / Oxidation potential).
Figures shown above are based on data collected from 04/05/1993 to 14/10/2009. N/A = Not Available.

| Autumn | Physico-chemical indicators and interim default guideline values for aquatic ecosystems | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DO (mg/L) | | DO (% sat) | | Salinity | SpCond | pH | | Temp (°C) | | Turb | Redox |
| | lower | upper | lower | upper | (PPT) | (µS/cm) | lower | upper | lower | upper | NTU | (mV) |
| 6 – 10 m | 6.6 | 9.0 | 75.6 | 95.3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 11 – 15 m | 4.3 | 6.1 | 50.1 | 71.1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16 – 20 m | 3.3 | 4.6 | 39.2 | 53.3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 21 – 25 m | 3.3 | 4.3 | 39.2 | 49.6 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

NB: DO (dissolved oxygen), SPCond (Specific conductance), Turb (turbidity), Redox (Reduction / Oxidation potential).
Figures shown above are based on data collected from 04/05/1993 to 14/10/2009. N/A = Not Available.

| Winter | Physico-chemical indicators and interim default guideline values for aquatic ecosystems | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DO (mg/L) | | DO (% sat) | | Salinity | SpCond | pH | | Temp (°C) | | Turb | Redox |
| | lower | upper | lower | upper | (PPT) | (µS/cm) | lower | upper | lower | upper | NTU | (mV) |
| 6 – 10 m | 7.3 | 9.5 | 80.9 | 95.4 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 11 – 15 m | 4.8 | 7.2 | 55.4 | 80.3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16 – 20 m | 3.4 | 4.8 | 40.4 | 56.1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 21 – 25 m | 3.0 | 4.1 | 35.3 | 47.2 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

NB: DO (dissolved oxygen), SPCond (Specific conductance), Turb (turbidity), Redox (Reduction / Oxidation potential).
Figures shown above are based on data collected from 04/05/1993 to 14/10/2009. N/A = Not Available.

| Spring | Physico-chemical indicators and interim default guideline values for aquatic ecosystems | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DO (mg/L) | | DO (% sat) | | Salinity | SpCond | pH | | Temp (°C) | | Turb | Redox |
| | lower | upper | lower | upper | (PPT) | (µS/cm) | lower | upper | lower | upper | NTU | (mV) |
| 6 – 10 m | 7.6 | 9.5 | 83.0 | 96.3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 11 – 15 m | 5.3 | 7.3 | 60.5 | 81.6 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16 – 20 m | 4.0 | 5.4 | 46.3 | 61.4 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 21 – 25 m | 3.3 | 4.2 | 38.0 | 47.8 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

NB: DO (dissolved oxygen), SPCond (Specific conductance), Turb (turbidity), Redox (Reduction / Oxidation potential).
Figures shown above are based on data collected from 04/05/1993 to 14/10/2009. N/A = Not Available.

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