

Oil Spill Response Atlas – Segment 97

The 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: Huon Estuary and Port Cygnet

OSRA Segment: 97

IMCRA Mesoscale Region: Bruny

IMCRA Provincial Region: Tasmanian Shelf

Ecosystem Classification: Slightly to Moderately Disturbed Ecosystem

Data Provider: Aquenal

BEMP Sites: M10, M11 and M14

Period of record: 18/03/2009 to 12/10/2018.

Default Guideline Values

Data from three locations (BEMP-HEDC10 (M10), BEMP-HEDC11 (M11), and BEMP-HEDC14 (M14)) have been used in the derivation of the DGVs presented here in. For each site field measurements were taken at the surface, 5 metres and approximately one metre from the bottom. Nutrient samples for laboratory analysis were taken at the surface, and near the bottom of the water column. Chlorophyll a data was collected for laboratory analysis from a 12 metre integrated sample (surface to a depth of 12 metres).

The following tables display the combined data as percentiles for the surface, 5 metre depth and near the bottom of the water column. Data from the 5 metre and near bottom depths have been combined to represent the water column below the halocline. The shaded values represent the default guideline values (DGVs) for aquatic ecosystems for the depth indicated on an annual or seasonal basis. These can be applied as DGVs for aquatic ecosystems of waters encompassed within OSRA segment 97 (as highlighted above). The DGVs are summarised in Appendix A. The following links provide Information on the [IMCRA spatial network](#) and the Interim [Default guideline values for Coastal and Marine waters of Tasmania](#).

Annual DGVs for Aquatic Ecosystems for Surface waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	6.8	7.1	7.4	8.1	8.9	9.5	10.0	432
Dissolved Oxygen (%)	83.0	86.5	89.3	95.3	101.7	104.4	107.3	432
Salinity (PPT)	13.2	19.2	24.4	31.6	34.3	34.9	35.4	423
Field Cond@TRef25 (mS/cm)	20.1	28.4	38.4	48.6	52.5	53.7	54.5	255
pH field - sensor TC	7.6	7.7	7.8	8.0	8.1	8.2	8.3	381
Temperature (Celsius)	8.9	9.8	11.1	15.0	17.5	18.5	19.4	432
Turbidity (NTU)	0.4	0.7	1.2	3.8	10.3	16.5	22.2	142
Redox (mV)	-964	37	102	394	443	453	468	261
Chlorophyll a (µg/L)*	0.3	0.3	0.5	1.4	2.9	4.1	5.1	435
TAN as N (mg/L)	0.003	0.003	0.003	0.006	0.010	0.014	0.017	401
Nitrite and Nitrate as N mg/L	0.001	0.001	0.001	0.022	0.048	0.059	0.064	156
Nitrate as N mg/L	0.001	0.001	0.001	0.008	0.035	0.049	0.055	404
Nitrite as N mg/L	0.001	0.001	0.001	0.003	0.007	0.012	0.013	116
Nitrogen (Total) as N mg/L	0.16	0.17	0.21	0.26	0.32	0.35	0.37	435
Phosphorus (Total) as P mg/L	0.01	0.02	0.02	0.03	0.03	0.04	0.04	435
DRP as P mg/L	0.002	0.003	0.004	0.007	0.010	0.011	0.013	288
Silica as Si mg/L	0.1	0.2	0.3	0.6	1.5	1.9	2.5	288

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Summer DGVs for Aquatic Ecosystems for Surface waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	7.0	7.1	7.4	7.9	8.3	8.5	8.6	102
Dissolved Oxygen (%)	90.1	92.0	93.8	99.3	104.2	106.5	108.4	102
Salinity (PPT)	21.4	23.8	30.0	33.1	34.6	35.1	35.5	96
Field Cond@TRef25 (mS/cm)	21.2	31.7	39.8	50.9	53.4	53.8	54.0	60
pH field - sensor TC	7.6	7.7	7.8	8.0	8.1	8.2	8.3	78
Temperature (Celsius)	15.5	16.1	16.5	17.9	19.2	20.2	20.8	102
Turbidity (NTU)	0.4	0.4	0.9	7.5	17.2	25.3	28.7	39
Redox (mV)	-1	32	44	382	439	442	458	60
Chlorophyll a (µg/L)*	0.7	0.9	1.3	1.9	2.8	3.3	4.2	102
TAN as N (mg/L)	0.001	0.003	0.003	0.005	0.007	0.008	0.010	89
Nitrite and Nitrate as N mg/L	0.001	0.001	0.001	0.001	0.002	0.004	0.006	27
Nitrate as N mg/L	0.001	0.001	0.001	0.001	0.001	0.003	0.005	89
Nitrite as N mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	23
Nitrogen (Total) as N mg/L	0.13	0.15	0.17	0.24	0.30	0.32	0.34	102
Phosphorus (Total) as P mg/L	0.01	0.02	0.02	0.03	0.03	0.04	0.04	102
DRP as P mg/L	0.002	0.002	0.003	0.005	0.007	0.008	0.009	66
Silica as Si mg/L	0.1	0.1	0.2	0.3	0.8	1.4	1.5	66

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Autumn DGVs for Aquatic Ecosystems for Surface waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	6.6	6.8	7.1	7.6	8.2	8.7	9.1	153
Dissolved Oxygen (%)	79.7	82.7	86.3	91.2	97.3	101.8	103.7	153
Salinity (PPT)	16.9	22.3	27.2	32.7	34.7	35.2	35.8	150
Field Cond@TRef25 (mS/cm)	25.5	33.1	41.3	49.9	53.4	54.4	56.7	87
pH field - sensor TC	7.7	7.7	7.8	8.0	8.1	8.2	8.3	138
Temperature (Celsius)	10.4	11.2	13.4	15.5	16.8	17.8	18.6	153
Turbidity (NTU)	0.8	0.9	1.6	8.0	9.3	10.1	10.4	27
Redox (mV)	-999	-999	88	398	445	451	454	96
Chlorophyll a (µg/L)*	0.3	0.3	0.7	1.7	3.6	4.9	6.5	156
TAN as N (mg/L)	0.003	0.003	0.003	0.006	0.011	0.016	0.019	141
Nitrite and Nitrate as N mg/L	0.001	0.001	0.001	0.024	0.041	0.045	0.053	60
Nitrate as N mg/L	0.001	0.001	0.001	0.011	0.027	0.034	0.037	144
Nitrite as N mg/L	0.001	0.001	0.001	0.005	0.013	0.016	0.019	45
Nitrogen (Total) as N mg/L	0.19	0.20	0.22	0.28	0.32	0.35	0.36	156
Phosphorus (Total) as P mg/L	0.02	0.02	0.02	0.03	0.04	0.04	0.05	156
DRP as P mg/L	0.003	0.004	0.005	0.008	0.011	0.012	0.013	99
Silica as Si mg/L	0.1	0.2	0.3	0.5	1.2	1.7	2.1	99

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Winter DGVs for Aquatic Ecosystems for Surface waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	7.5	7.9	8.2	8.8	9.8	10.5	10.7	90
Dissolved Oxygen (%)	86.3	87.3	89.3	93.3	95.9	98.4	99.1	90
Salinity (PPT)	9.0	10.8	19.0	25.9	31.8	34.0	34.6	90
Field Cond@TRef25 (mS/cm)	17.6	22.3	30.8	41.8	49.1	52.0	53.1	54
pH field - sensor TC	7.5	7.7	7.8	7.9	8.1	8.2	8.2	87
Temperature (Celsius)	7.6	8.0	8.6	10.3	11.7	12.1	12.8	90
Turbidity (NTU)	0.9	1.1	1.4	4.1	15.4	18.5	19.8	37
Redox (mV)	122	132	153	365	463	467	471	54
Chlorophyll a (µg/L)*	0.3	0.3	0.3	0.3	0.6	0.7	0.8	90
TAN as N (mg/L)	0.003	0.003	0.003	0.008	0.011	0.012	0.015	87
Nitrite and Nitrate as N mg/L	0.028	0.036	0.046	0.055	0.064	0.074	0.080	36
Nitrate as N mg/L	0.020	0.025	0.033	0.047	0.056	0.063	0.071	87
Nitrite as N mg/L	0.003	0.004	0.004	0.005	0.007	0.009	0.011	24
Nitrogen (Total) as N mg/L	0.17	0.20	0.23	0.31	0.35	0.38	0.38	90
Phosphorus (Total) as P mg/L	0.01	0.02	0.02	0.03	0.03	0.04	0.04	90
DRP as P mg/L	0.005	0.006	0.007	0.009	0.011	0.012	0.013	63
Silica as Si mg/L	0.4	0.4	0.6	1.4	1.9	2.4	2.7	63

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Spring DGVs for Aquatic Ecosystems for Surface waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	7.7	7.9	8.2	8.6	9.2	9.6	10.0	87
Dissolved Oxygen (%)	92.1	93.3	94.6	100.1	104.2	106.5	111.2	87
Salinity (PPT)	12.4	19.5	24.2	31.2	33.3	34.0	34.5	87
Field Cond@TRef25 (mS/cm)	27.0	34.6	39.9	48.4	50.7	52.2	52.7	54
pH field - sensor TC	7.6	7.7	7.8	8.0	8.2	8.2	8.3	78
Temperature (Celsius)	10.4	11.3	12.4	14.0	15.7	16.8	18.1	87
Turbidity (NTU)	0.2	0.7	1.0	2.4	4.2	6.7	9.7	39
Redox (mV)	14	72	108	402	444	453	467	51
Chlorophyll a (µg/L)*	0.3	0.3	0.9	1.7	3.5	4.4	5.1	87
TAN as N (mg/L)	0.003	0.003	0.003	0.006	0.010	0.015	0.018	84
Nitrite and Nitrate as N mg/L	0.001	0.001	0.001	0.007	0.031	0.042	0.048	33
Nitrate as N mg/L	0.001	0.001	0.001	0.005	0.018	0.026	0.028	84
Nitrite as N mg/L	0.001	0.001	0.001	0.001	0.003	0.003	0.004	24
Nitrogen (Total) as N mg/L	0.16	0.18	0.21	0.24	0.29	0.33	0.36	87
Phosphorus (Total) as P mg/L	0.01	0.01	0.02	0.02	0.03	0.04	0.04	87
DRP as P mg/L	0.002	0.002	0.003	0.005	0.006	0.007	0.008	60
Silica as Si mg/L	0.1	0.2	0.3	0.7	1.6	2.6	3.1	60

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Annual DGVs for Aquatic Ecosystems for mid water 5 m (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	5.9	6.3	6.8	7.5	8.2	8.6	8.8	432
Dissolved Oxygen (%)	73.3	78.4	82.4	90.1	99.5	103.5	107.6	432
Salinity (PPT)	33.6	34.1	34.4	35.0	35.7	36.2	36.8	423
Field Cond@TRef25 (mS/cm)	51.9	52.2	52.8	53.7	54.7	55.6	56.7	255
pH field - sensor TC	7.7	7.7	7.8	8.0	8.2	8.2	8.3	375
Temperature (Celsius)	11.3	11.7	12.2	14.6	16.6	17.4	17.8	432
Turbidity (NTU)	0.2	0.3	0.5	3.4	8.5	11.7	18.0	126
Redox (mV)	-968	38	101	404	448	460	475	261
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)					ND			
Nitrite and Nitrate as N mg/L					ND			
Nitrate as N mg/L					ND			
Nitrite as N mg/L					ND			
Nitrogen (Total) as N mg/L					ND			
Phosphorus (Total) as P mg/L					ND			
DRP as P mg/L					ND			
Silica as Si mg/L					ND			

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Summer DGVs for Aquatic Ecosystems for mid water 5 m (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	6.2	6.6	7.1	7.7	8.4	8.5	8.8	102
Dissolved Oxygen (%)	79.6	83.5	88.8	97.9	104.4	107.8	110.5	102
Salinity (PPT)	33.4	34.1	34.3	34.8	35.5	35.7	36.0	96
Field Cond@TRef25 (mS/cm)	48.8	51.5	52.1	53.4	54.0	54.7	56.1	60
pH field - sensor TC	7.7	7.8	7.9	8.1	8.2	8.2	8.3	78
Temperature (Celsius)	14.5	14.7	15.1	16.6	17.7	18.6	19.1	102
Turbidity (NTU)	0.2	0.3	0.5	3.7	10.7	19.4	22.5	37
Redox (mV)	3	32	43	399	441	449	461	60
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)					ND			
Nitrite and Nitrate as N mg/L					ND			
Nitrate as N mg/L					ND			
Nitrite as N mg/L					ND			
Nitrogen (Total) as N mg/L					ND			
Phosphorus (Total) as P mg/L					ND			
DRP as P mg/L					ND			
Silica as Si mg/L					ND			

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Autumn DGVs for Aquatic Ecosystems for mid water 5 m (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	5.4	5.8	6.2	6.9	7.5	7.8	8.1	153
Dissolved Oxygen (%)	66.6	72.1	77.2	85.4	91.9	96.9	100.1	153
Salinity (PPT)	34.2	34.5	34.8	35.1	36.0	36.3	37.3	150
Field Cond@TRef25 (mS/cm)	52.7	52.9	53.1	54.0	55.0	56.4	56.9	87
pH field - sensor TC	7.7	7.7	7.8	8.0	8.1	8.2	8.3	132
Temperature (Celsius)	13.5	13.8	14.4	15.7	16.6	17.0	17.7	153
Turbidity (NTU)	0.7	1.4	2.8	7.8	8.3	9.4	9.9	24
Redox (mV)	-999	-999	85	408	448	454	771	96
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)					ND			
Nitrite and Nitrate as N mg/L					ND			
Nitrate as N mg/L					ND			
Nitrite as N mg/L					ND			
Nitrogen (Total) as N mg/L					ND			
Phosphorus (Total) as P mg/L					ND			
DRP as P mg/L					ND			
Silica as Si mg/L					ND			

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Winter DGVs for Aquatic Ecosystems for mid water 5 m (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	6.8	6.9	7.2	7.5	8.0	8.1	8.2	90
Dissolved Oxygen (%)	79.6	81.1	83.9	87.2	90.7	92.8	93.2	90
Salinity (PPT)	34.0	34.2	34.4	35.0	35.8	36.3	36.9	90
Field Cond@TRef25 (mS/cm)	52.3	52.6	53.3	54.0	54.7	55.4	56.2	54
pH field - sensor TC	7.7	7.7	7.8	8.0	8.1	8.2	8.2	87
Temperature (Celsius)	9.9	10.3	11.4	12.0	12.8	13.2	13.5	90
Turbidity (NTU)	0.2	0.2	0.2	7.8	9.1	14.9	17.7	33
Redox (mV)	126	136	150	365	464	472	474	54
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)					ND			
Nitrite and Nitrate as N mg/L					ND			
Nitrate as N mg/L					ND			
Nitrite as N mg/L					ND			
Nitrogen (Total) as N mg/L					ND			
Phosphorus (Total) as P mg/L					ND			
DRP as P mg/L					ND			
Silica as Si mg/L					ND			

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Spring DGVs for Aquatic Ecosystems for mid water 5 m (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	7.2	7.3	7.7	8.3	8.7	8.9	9.6	87
Dissolved Oxygen (%)	84.8	86.2	90.3	97.5	103.2	105.3	112.2	87
Salinity (PPT)	33.1	33.7	34.0	34.8	35.6	35.9	37.0	87
Field Cond@TRef25 (mS/cm)	51.3	51.9	52.3	53.7	54.2	55.2	56.1	54
pH field - sensor TC	7.7	7.7	7.8	8.0	8.2	8.3	8.3	78
Temperature (Celsius)	11.3	11.5	12.0	12.7	14.1	14.6	15.3	87
Turbidity (NTU)	0.4	0.4	0.5	1.5	5.1	6.8	8.8	32
Redox (mV)	11	71	107	404	448	457	474	51
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)					ND			
Nitrite and Nitrate as N mg/L					ND			
Nitrate as N mg/L					ND			
Nitrite as N mg/L					ND			
Nitrogen (Total) as N mg/L					ND			
Phosphorus (Total) as P mg/L					ND			
DRP as P mg/L					ND			
Silica as Si mg/L					ND			

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Annual DGVs for Aquatic Ecosystems for bottom waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	4.6	5.0	5.6	6.6	7.3	7.6	8.0	432
Dissolved Oxygen (%)	58.2	61.9	68.5	78.7	87.4	90.3	92.7	432
Salinity (PPT)	34.7	34.8	34.9	35.3	36.2	36.6	37.5	423
Field Cond@TRef25 (mS/cm)	53.0	53.2	53.4	54.4	55.1	56.5	57.4	255
pH field - sensor TC	7.6	7.7	7.8	8.0	8.1	8.2	8.3	375
Temperature (Celsius)	11.7	11.9	12.3	14.2	15.9	16.5	17.1	432
Turbidity (NTU)	0.5	0.7	1.1	4.2	10.0	12.5	16.4	129
Redox (mV)	-997	19	95	405	448	459	473	261
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.003	0.003	0.008	0.020	0.026	0.031	402
Nitrite and Nitrate as N mg/L	0.001	0.003	0.014	0.046	0.063	0.068	0.071	156
Nitrate as N mg/L	0.002	0.005	0.012	0.030	0.054	0.062	0.068	404
Nitrite as N mg/L	0.001	0.001	0.002	0.007	0.014	0.017	0.019	117
Nitrogen (Total) as N mg/L	0.18	0.21	0.24	0.29	0.35	0.37	0.39	435
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.04	0.05	0.05	0.05	435
DRP as P mg/L	0.007	0.010	0.011	0.013	0.016	0.018	0.020	288
Silica as Si mg/L	0.1	0.2	0.2	0.3	0.4	0.5	0.5	288

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Summer DGVs for Aquatic Ecosystems for bottom waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	4.7	4.9	5.3	6.2	7.1	7.4	7.6	102
Dissolved Oxygen (%)	58.2	61.4	65.6	76.7	87.7	90.2	91.9	102
Salinity (PPT)	34.7	34.7	34.8	35.2	36.1	36.3	36.5	96
Field Cond@TRef25 (mS/cm)	50.9	52.8	53.1	54.0	54.9	55.4	56.5	60
pH field - sensor TC	7.6	7.6	7.8	8.0	8.1	8.2	8.3	78
Temperature (Celsius)	13.4	13.8	14.2	15.5	16.4	17.2	17.4	102
Turbidity (NTU)	0.9	1.2	1.5	4.9	9.4	10.3	14.6	31
Redox (mV)	-7	15	30	397	442	453	485	60
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.001	0.003	0.005	0.014	0.026	0.030	0.034	90
Nitrite and Nitrate as N mg/L	0.001	0.001	0.001	0.007	0.023	0.029	0.041	27
Nitrate as N mg/L	0.001	0.001	0.002	0.010	0.018	0.026	0.033	90
Nitrite as N mg/L	0.001	0.001	0.001	0.001	0.006	0.011	0.014	24
Nitrogen (Total) as N mg/L	0.16	0.17	0.20	0.27	0.31	0.34	0.35	102
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.04	0.04	0.05	0.06	102
DRP as P mg/L	0.005	0.006	0.009	0.012	0.015	0.018	0.019	66
Silica as Si mg/L	0.1	0.2	0.2	0.3	0.4	0.4	0.5	66

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Autumn DGVs for Aquatic Ecosystems for bottom waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	4.4	4.6	5.1	6.0	6.9	7.2	7.4	153
Dissolved Oxygen (%)	54.5	59.5	63.4	74.4	83.6	87.6	91.0	153
Salinity (PPT)	34.9	35.0	35.1	35.3	36.4	36.6	37.5	150
Field Cond@TRef25 (mS/cm)	53.1	53.2	53.6	54.8	55.3	56.7	57.4	87
pH field - sensor TC	7.6	7.7	7.8	8.0	8.1	8.2	8.3	132
Temperature (Celsius)	13.8	14.0	14.5	15.7	16.4	16.9	17.1	153
Turbidity (NTU)	0.9	1.0	1.8	6.1	11.4	12.6	13.9	30
Redox (mV)	-999	-999	72	408	448	453	455	96
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.003	0.003	0.010	0.020	0.023	0.030	141
Nitrite and Nitrate as N mg/L	0.002	0.012	0.018	0.042	0.057	0.066	0.071	60
Nitrate as N mg/L	0.007	0.010	0.015	0.027	0.046	0.058	0.068	143
Nitrite as N mg/L	0.001	0.001	0.007	0.013	0.018	0.021	0.021	45
Nitrogen (Total) as N mg/L	0.20	0.22	0.26	0.31	0.35	0.38	0.39	156
Phosphorus (Total) as P mg/L	0.03	0.03	0.03	0.04	0.05	0.05	0.05	156
DRP as P mg/L	0.010	0.011	0.012	0.014	0.018	0.019	0.021	99
Silica as Si mg/L	0.2	0.2	0.2	0.3	0.4	0.5	0.5	99

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Winter DGVs for Aquatic Ecosystems for bottom waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	6.4	6.5	6.8	7.2	7.6	7.9	8.1	90
Dissolved Oxygen (%)	75.1	76.8	79.6	84.4	88.9	90.9	92.6	90
Salinity (PPT)	34.5	34.7	34.8	35.2	36.2	36.8	37.9	90
Field Cond@TRef25 (mS/cm)	53.3	53.4	53.7	54.4	55.0	56.7	57.2	54
pH field - sensor TC	7.6	7.7	7.8	7.9	8.1	8.1	8.2	87
Temperature (Celsius)	10.5	10.7	11.8	12.4	13.2	13.3	13.6	90
Turbidity (NTU)	0.1	0.6	0.9	7.4	11.9	15.0	17.4	33
Redox (mV)	118	132	148	364	464	472	474	54
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.003	0.003	0.005	0.008	0.009	0.012	87
Nitrite and Nitrate as N mg/L	0.052	0.054	0.058	0.065	0.068	0.071	0.078	36
Nitrate as N mg/L	0.040	0.044	0.047	0.055	0.063	0.069	0.072	87
Nitrite as N mg/L	0.004	0.004	0.005	0.006	0.008	0.011	0.016	24
Nitrogen (Total) as N mg/L	0.20	0.23	0.25	0.33	0.37	0.39	0.42	90
Phosphorus (Total) as P mg/L	0.03	0.03	0.03	0.03	0.04	0.05	0.05	90
DRP as P mg/L	0.010	0.011	0.012	0.014	0.015	0.016	0.017	63
Silica as Si mg/L	0.2	0.2	0.2	0.3	0.3	0.4	0.5	63

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Spring DGVs for Aquatic Ecosystems for bottom waters (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	5.2	5.7	6.1	6.9	7.6	7.8	8.1	87
Dissolved Oxygen (%)	61.1	66.6	70.6	81.0	89.1	92.1	94.6	87
Salinity (PPT)	34.6	34.7	34.9	35.6	36.2	36.5	37.7	87
Field Cond@TRef25 (mS/cm)	53.2	53.3	54.0	54.4	55.0	56.3	56.8	54
pH field - sensor TC	7.6	7.6	7.8	8.0	8.1	8.2	8.3	78
Temperature (Celsius)	10.9	11.7	11.8	12.4	13.1	13.3	13.4	87
Turbidity (NTU)	0.5	0.6	1.1	3.0	6.2	7.5	15.3	35
Redox (mV)	2	69	101	409	450	459	475	51
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.005	0.006	0.007	0.012	0.022	0.026	0.033	84
Nitrite and Nitrate as N mg/L	0.009	0.014	0.024	0.049	0.056	0.061	0.064	33
Nitrate as N mg/L	0.003	0.012	0.017	0.039	0.051	0.058	0.068	84
Nitrite as N mg/L	0.001	0.001	0.003	0.004	0.008	0.008	0.009	24
Nitrogen (Total) as N mg/L	0.21	0.23	0.26	0.29	0.33	0.36	0.39	87
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.04	0.05	0.05	0.05	87
DRP as P mg/L	0.009	0.010	0.010	0.014	0.016	0.019	0.021	60
Silica as Si mg/L	0.1	0.1	0.2	0.2	0.3	0.4	0.4	60

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Annual DGVs for Aquatic Ecosystems for below halocline (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	5.0	5.5	6.1	7.1	7.8	8.2	8.6	864
Dissolved Oxygen (%)	61.6	67.1	74.3	85.0	93.3	100.4	103.7	864
Salinity (PPT)	34.1	34.4	34.7	35.2	36.1	36.5	37.2	846
Field Cond@TRef25 (mS/cm)	52.1	52.7	53.2	54.1	55.0	56.1	57.1	510
pH field - sensor TC	7.6	7.7	7.8	8.0	8.1	8.2	8.3	750
Temperature (Celsius)	11.4	11.8	12.3	14.4	16.2	17.0	17.5	864
Turbidity (NTU)	0.2	0.5	0.8	3.5	9.4	12.4	17.1	255
Redox (mV)	-996	28	97	405	448	460	475	522
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.003	0.003	0.008	0.020	0.026	0.031	402
Nitrite and Nitrate as N mg/L	0.001	0.003	0.014	0.046	0.063	0.068	0.071	156
Nitrate as N mg/L	0.002	0.005	0.012	0.030	0.054	0.062	0.068	404
Nitrite as N mg/L	0.001	0.001	0.002	0.007	0.014	0.017	0.019	117
Nitrogen (Total) as N mg/L	0.18	0.21	0.24	0.29	0.35	0.37	0.39	435
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.04	0.05	0.05	0.05	435
DRP as P mg/L	0.007	0.010	0.011	0.013	0.016	0.018	0.020	288
Silica as Si mg/L	0.1	0.2	0.2	0.3	0.4	0.5	0.5	288

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Summer DGVs for Aquatic Ecosystems for below halocline (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	4.9	5.3	5.8	7.1	8.0	8.4	8.5	204
Dissolved Oxygen (%)	61.4	65.7	72.6	88.4	100.6	104.5	107.9	204
Salinity (PPT)	33.9	34.3	34.6	35.1	35.7	36.1	36.5	192
Field Cond@TRef25 (mS/cm)	48.9	51.9	52.7	53.7	54.6	55.2	56.5	120
pH field - sensor TC	7.6	7.7	7.8	8.0	8.2	8.2	8.3	156
Temperature (Celsius)	13.8	14.1	14.6	16.0	17.4	17.7	18.6	204
Turbidity (NTU)	0.2	0.5	1.1	4.4	9.8	13.9	20.7	68
Redox (mV)	-7	15	37	399	442	449	465	120
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.001	0.003	0.005	0.014	0.026	0.030	0.034	90
Nitrite and Nitrate as N mg/L	0.001	0.001	0.001	0.007	0.023	0.029	0.041	27
Nitrate as N mg/L	0.001	0.001	0.002	0.010	0.018	0.026	0.033	90
Nitrite as N mg/L	0.001	0.001	0.001	0.001	0.006	0.011	0.014	24
Nitrogen (Total) as N mg/L	0.16	0.17	0.20	0.27	0.31	0.34	0.35	102
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.04	0.04	0.05	0.06	102
DRP as P mg/L	0.005	0.006	0.009	0.012	0.015	0.018	0.019	66
Silica as Si mg/L	0.1	0.2	0.2	0.3	0.4	0.4	0.5	66

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Autumn DGVs for Aquatic Ecosystems for below halocline (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	4.6	5.1	5.6	6.5	7.2	7.6	8.0	306
Dissolved Oxygen (%)	58.9	62.9	69.2	79.6	89.2	93.6	97.1	306
Salinity (PPT)	34.5	34.7	34.9	35.2	36.3	36.6	37.5	300
Field Cond@TRef25 (mS/cm)	52.9	53.1	53.3	54.6	55.2	56.5	57.4	174
pH field - sensor TC	7.6	7.7	7.8	8.0	8.1	8.2	8.3	264
Temperature (Celsius)	13.5	13.9	14.5	15.7	16.5	17.0	17.3	306
Turbidity (NTU)	0.8	1.0	2.0	7.8	10.1	11.5	12.7	54
Redox (mV)	-999	-999	75	408	448	454	529	192
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.003	0.003	0.010	0.020	0.023	0.030	141
Nitrite and Nitrate as N mg/L	0.002	0.012	0.018	0.042	0.057	0.066	0.071	60
Nitrate as N mg/L	0.007	0.010	0.015	0.027	0.046	0.058	0.068	143
Nitrite as N mg/L	0.001	0.001	0.007	0.013	0.018	0.021	0.021	45
Nitrogen (Total) as N mg/L	0.20	0.22	0.26	0.31	0.35	0.38	0.39	156
Phosphorus (Total) as P mg/L	0.03	0.03	0.03	0.04	0.05	0.05	0.05	156
DRP as P mg/L	0.010	0.011	0.012	0.014	0.018	0.019	0.021	99
Silica as Si mg/L	0.2	0.2	0.2	0.3	0.4	0.5	0.5	99

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Winter DGVs for Aquatic Ecosystems for below halocline (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	6.5	6.7	7.0	7.4	7.8	8.1	8.2	180
Dissolved Oxygen (%)	76.8	79.3	81.2	85.6	90.2	92.1	93.1	180
Salinity (PPT)	34.2	34.4	34.7	35.1	36.0	36.5	37.4	180
Field Cond@TRef25 (mS/cm)	52.6	53.2	53.4	54.2	54.9	56.0	57.1	108
pH field - sensor TC	7.6	7.7	7.8	7.9	8.1	8.1	8.2	174
Temperature (Celsius)	10.1	10.6	11.7	12.2	13.0	13.3	13.5	180
Turbidity (NTU)	0.1	0.2	0.6	7.6	11.4	15.4	18.0	66
Redox (mV)	123	133	149	365	464	472	474	108
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.003	0.003	0.005	0.008	0.009	0.012	87
Nitrite and Nitrate as N mg/L	0.052	0.054	0.058	0.065	0.068	0.071	0.078	36
Nitrate as N mg/L	0.040	0.044	0.047	0.055	0.063	0.069	0.072	87
Nitrite as N mg/L	0.004	0.004	0.005	0.006	0.008	0.011	0.016	24
Nitrogen (Total) as N mg/L	0.20	0.23	0.25	0.33	0.37	0.39	0.42	90
Phosphorus (Total) as P mg/L	0.03	0.03	0.03	0.03	0.04	0.05	0.05	90
DRP as P mg/L	0.010	0.011	0.012	0.014	0.015	0.016	0.017	63
Silica as Si mg/L	0.2	0.2	0.2	0.3	0.3	0.4	0.5	63

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Spring DGVs for Aquatic Ecosystems for below halocline (Shaded)

Parameter	5 th %ile	10 th %ile	20 th %ile	Median	80 th %ile	90 th %ile	95 th %ile	Sample Number
Dissolved Oxygen (mg/L)	5.7	6.1	6.7	7.6	8.4	8.7	8.9	174
Dissolved Oxygen (%)	66.7	70.7	77.3	89.6	99.9	103.2	105.2	174
Salinity (PPT)	33.7	34.0	34.5	35.1	36.0	36.5	37.3	174
Field Cond@TRef25 (mS/cm)	51.9	52.3	53.0	54.1	54.7	55.6	56.7	108
pH field - sensor TC	7.6	7.7	7.8	8.0	8.2	8.3	8.3	156
Temperature (Celsius)	11.2	11.6	11.9	12.6	13.3	14.3	14.7	174
Turbidity (NTU)	0.4	0.5	0.7	2.1	5.9	7.3	10.0	67
Redox (mV)	-39	70	104	407	449	459	479	102
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.005	0.006	0.007	0.012	0.022	0.026	0.033	84
Nitrite and Nitrate as N mg/L	0.009	0.014	0.024	0.049	0.056	0.061	0.064	33
Nitrate as N mg/L	0.003	0.012	0.017	0.039	0.051	0.058	0.068	84
Nitrite as N mg/L	0.001	0.001	0.003	0.004	0.008	0.008	0.009	24
Nitrogen (Total) as N mg/L	0.21	0.23	0.26	0.29	0.33	0.36	0.39	87
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.04	0.05	0.05	0.05	87
DRP as P mg/L	0.009	0.010	0.010	0.014	0.016	0.019	0.021	60
Silica as Si mg/L	0.1	0.1	0.2	0.2	0.3	0.4	0.4	60

*Integrated sample 0 to 12 metres, TAN=Total Ammonia Nitrogen (NH₃ and NH₄⁺), DRP= Dissolved Reactive Phosphorous. ND = No data collected.

Appendix A

Surface	Physico-chemical indicators and default guideline values for aquatic ecosystems																				
	DO (mg/L)		DO (% sat)		Salinity	Cond	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	SiO ₂ as Si
	lower	upper	lower	upper	(PPT)	(mS/cm)	lower	upper	lower	upper	NTU	(mV)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	(µg/L)	(mg/L)
Annual	7.4	8.9	89.3	101.7	34.3	52.5	7.8	8.1	11.1	17.5	10.3	443	2.9	10.0	48.0	35.0	7.0	0.32	0.03	10.0	1.5
Summer	7.4	8.3	93.8	104.2	34.6	53.4	7.8	8.1	16.5	19.2	17.2	439	2.8	7.0	2.0	1.0	1.0	0.30	0.03	7.0	0.8
Autumn	7.1	8.2	86.3	97.3	34.7	53.4	7.8	8.1	13.4	16.8	9.3	445	3.6	11.0	41.0	27.0	13.0	0.32	0.04	11.0	1.2
Winter	8.2	9.8	89.3	95.9	31.8	49.1	7.8	8.1	8.6	11.7	15.4	463	0.6	11.0	64.0	56.0	7.0	0.35	0.03	11.0	1.9
Spring	8.2	9.2	94.6	104.2	33.3	50.7	7.8	8.2	12.4	15.7	4.2	444	3.5	10.0	31.0	18.0	3.0	0.29	0.03	6.0	1.6

NB: DO (dissolved oxygen), Turb (turbidity), Chl a (Chlorophyll a – Lab analysis), TAN (Total Ammonia Nitrogen (NH₃ and NH₄⁺)), NO_x (Nitrite and Nitrate), NO₃ (Nitrate), NO₂ (Nitrite), DRP (Dissolved reactive phosphorous), SiO₂ (Silica). Figures shown above are based on data collected from 18/03/2009 to 12/10/2018.

5 metres	Physico-chemical indicators and default guideline values for aquatic ecosystems																					
	DO (mg/L)		DO (% sat)		Salinity	Cond	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	SiO ₂ as Si	
	lower	upper	lower	upper	(PPT)	(mS/cm)	lower	upper	lower	upper	NTU	(mV)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	
Annual	6.8	8.2	82.4	99.5	35.7	54.7	7.8	8.1	12.2	16.6	8.5	448	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Summer	7.1	8.4	88.8	104.4	35.5	54.0	7.9	8.2	15.1	17.7	10.7	441	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Autumn	6.2	7.5	77.2	91.9	36.0	55.0	7.8	8.1	14.4	16.6	8.3	448	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Winter	7.2	8.0	83.9	90.7	35.8	54.7	7.8	8.1	11.4	12.8	9.1	464	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Spring	7.7	8.7	90.3	103.2	35.6	54.2	7.8	8.2	12.0	14.1	5.1	448	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NB: DO (dissolved oxygen), Turb (turbidity), Chl a (Chlorophyll a – Lab analysis), TAN (Total Ammonia Nitrogen (NH₃ and NH₄⁺)), NO_x (Nitrite and Nitrate), NO₃ (Nitrate), NO₂ (Nitrite), DRP (Dissolved reactive phosphorous), SiO₂ (Silica), ND = No Data. Figures shown above are based on data collected from 18/03/2009 to 12/10/2018.

Bottom	Physico-chemical indicators and default guideline values for aquatic ecosystems																				
	DO (mg/L)		DO (% sat)		Salinity	Cond	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	SiO ₂ as Si
	lower	upper	lower	upper	(PPT)	(mS/cm)	lower	upper	lower	upper	NTU	(mV)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	(µg/L)	(mg/L)
Annual	5.6	7.3	68.5	87.4	36.2	55.1	7.8	8.1	12.3	15.9	10.0	448	ND	20.0	63.0	54.0	14.0	0.35	0.05	16.0	0.4
Summer	5.3	7.1	65.6	87.7	36.1	54.9	7.8	8.1	14.2	16.4	9.4	442	ND	26.0	23.0	18.0	6.0	0.31	0.04	15.0	0.4
Autumn	5.1	6.9	63.4	83.6	36.4	55.3	7.8	8.1	14.5	16.4	11.4	448	ND	20.0	57.0	46.0	18.0	0.35	0.05	18.0	0.4
Winter	6.8	7.6	79.6	88.9	36.2	55.0	7.8	8.1	11.8	13.2	11.9	464	ND	8.0	68.0	63.0	8.0	0.37	0.04	15.0	0.3
Spring	6.1	7.6	70.6	89.1	36.2	55.0	7.8	8.1	11.8	13.1	6.2	450	ND	22.0	56.0	51.0	8.0	0.33	0.05	16.0	0.3

NB: DO (dissolved oxygen), Turb (turbidity), Chl a (Chlorophyll a – Lab analysis), TAN (Total Ammonia Nitrogen (NH₃ and NH₄⁺)), NO_x (Nitrite and Nitrate), NO₃ (Nitrate), NO₂ (Nitrite), DRP (Dissolved reactive phosphorous), SiO₂ (Silica), ND = No Data. Figures shown above are based on data collected from 17/03/2009 to 12/10/2018.

5 m and Bottom (Below halocline)	Physico-chemical indicators and default guideline values for aquatic ecosystems																				
	DO (mg/L)		DO (% sat)		Salinity	Cond	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	SiO ₂ as Si
	lower	upper	lower	upper	(PPT)	(mS/cm)	lower	upper	lower	upper	NTU	(mV)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	(µg/L)	(mg/L)
Annual	6.1	7.8	74.3	93.3	36.1	55.0	7.8	8.1	12.3	16.2	9.4	448	ND	20.0	63.0	54.0	14.0	0.35	0.05	16.0	0.4
Summer	5.8	8.1	72.6	100.6	35.7	54.6	7.8	8.2	14.6	17.4	9.8	442	ND	26.0	23.0	18.0	6.0	0.31	0.04	15.0	0.4
Autumn	5.6	7.2	69.2	89.2	36.3	55.2	7.8	8.1	14.5	16.5	10.1	448	ND	20.0	57.0	46.0	18.0	0.35	0.05	18.0	0.4
Winter	7.0	7.8	81.2	90.2	36.0	54.9	7.8	8.1	11.7	13.0	11.4	464	ND	8.0	68.0	63.0	8.0	0.37	0.04	15.0	0.3
Spring	6.7	8.4	77.3	99.9	36.0	54.7	7.8	8.2	11.9	13.3	5.9	449	ND	22.0	56.0	51.0	8.0	0.33	0.05	16.0	0.3

NB: DO (dissolved oxygen), Turb (turbidity), Chl a (Chlorophyll a – Lab analysis), TAN (Total Ammonia Nitrogen (NH₃ and NH₄⁺)), NO_x (Nitrite and Nitrate), NO₃ (Nitrate), NO₂ (Nitrite), DRP (Dissolved reactive phosphorous), SiO₂ (Silica), ND = No Data. Figures shown above are based on data collected from 17/03/2009 to 12/10/2018.