

Oil Spill Response Atlas – Segment 98

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

OSRA Segment: 98

IMCRA Mesoscale Region: Bruny

IMCRA Provincial Region: Tasmanian Shelf

Ecosystem Classification: Slightly to Moderately Disturbed Ecosystem

Data Provider: Aquenal

BEMP Sites: M13

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

Default Guideline Values

Data from one location (BEMP-HEDC13 (M13)) has been used in the derivation of the DGVs presented here in. 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 98 (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)	6.2	6.6	7.0	8.2	10.1	10.8	11.4	153
Dissolved Oxygen (%)	74.4	80.4	83.7	91.7	97.3	99.6	102.1	153
Salinity (PPT)	4.1	5.4	8.4	17.8	29.3	32.5	34.3	150
Field Cond@TRef25 (mS/cm)	7.8	11.5	13.9	29.7	45.2	49.5	51.9	94
pH field - sensor TC	7.1	7.3	7.5	7.8	8.0	8.1	8.2	136
Temperature (Celsius)	7.2	8.3	9.4	14.1	17.9	19.4	20.6	153
Turbidity (NTU)	1.0	1.2	2.0	5.1	10.6	17.4	18.4	57
Redox (mV)	-993	-874	66	310	441	462	475	96
Chlorophyll a (µg/L)*	0.3	0.3	0.3	1.3	2.3	3.0	4.0	145
TAN as N (mg/L)	0.003	0.004	0.006	0.010	0.015	0.018	0.021	141
Nitrite and Nitrate as N mg/L	0.001	0.001	0.004	0.025	0.046	0.057	0.064	60
Nitrate as N mg/L	0.001	0.001	0.001	0.011	0.030	0.040	0.047	141
Nitrite as N mg/L	0.001	0.001	0.001	0.004	0.009	0.010	0.013	47
Nitrogen (Total) as N mg/L	0.16	0.17	0.20	0.25	0.31	0.33	0.35	153
Phosphorus (Total) as P mg/L	0.01	0.01	0.01	0.02	0.03	0.03	0.04	153
DRP as P mg/L	0.002	0.002	0.003	0.005	0.008	0.010	0.013	96
Silica as Si mg/L	0.6	0.8	1.4	2.5	2.9	3.2	3.4	96

*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)	6.5	6.6	6.9	7.4	8.2	8.8	8.9	34
Dissolved Oxygen (%)	82.0	82.8	84.9	90.2	95.0	100.0	102.1	34
Salinity (PPT)	6.4	10.0	11.3	19.2	27.6	30.9	31.8	32
Field Cond@TRef25 (mS/cm)	8.3	12.2	17.0	30.5	41.8	43.6	47.7	20
pH field - sensor TC	7.1	7.3	7.5	7.7	8.0	8.0	8.1	26
Temperature (Celsius)	16.0	16.7	16.9	19.1	20.6	21.8	22.2	34
Turbidity (NTU)	1.0	1.4	2.0	10.5	18.4	18.5	20.0	11
Redox (mV)	12	28	49	394	440	449	478	20
Chlorophyll a (µg/L)*	0.7	1.1	1.1	2.0	2.8	3.6	4.3	34
TAN as N (mg/L)	0.002	0.003	0.004	0.007	0.009	0.009	0.009	30
Nitrite and Nitrate as N mg/L	0.001	0.001	0.001	0.001	0.004	0.004	0.005	9
Nitrate as N mg/L	0.001	0.001	0.001	0.001	0.001	0.004	0.005	29
Nitrite as N mg/L	0.001	0.001	0.001	0.001	0.002	0.002	0.003	8
Nitrogen (Total) as N mg/L	0.13	0.14	0.17	0.22	0.28	0.31	0.34	34
Phosphorus (Total) as P mg/L	0.01	0.01	0.02	0.02	0.03	0.03	0.03	34
DRP as P mg/L	0.001	0.002	0.002	0.004	0.004	0.006	0.007	22
Silica as Si mg/L	0.8	0.8	1.1	2.2	2.7	2.8	2.8	22

*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)	5.8	6.1	6.6	7.4	9.1	9.6	9.7	57
Dissolved Oxygen (%)	67.4	74.1	79.6	85.9	92.2	95.0	96.2	57
Salinity (PPT)	6.1	6.8	11.4	25.3	31.6	34.0	34.8	56
Field Cond@TRef25 (mS/cm)	10.6	11.9	14.1	40.7	48.2	51.6	52.7	35
pH field - sensor TC	7.3	7.5	7.5	7.9	8.0	8.0	8.1	52
Temperature (Celsius)	9.4	10.1	12.5	14.5	16.7	17.5	18.4	57
Turbidity (NTU)	0.9	1.1	1.6	2.7	9.2	9.5	10.2	14
Redox (mV)	-997	-994	-936	237	437	457	467	38
Chlorophyll a (µg/L)*	0.3	0.3	0.5	1.4	2.0	2.6	2.9	52
TAN as N (mg/L)	0.005	0.006	0.007	0.012	0.017	0.022	0.026	51
Nitrite and Nitrate as N mg/L	0.003	0.004	0.009	0.033	0.050	0.057	0.059	25
Nitrate as N mg/L	0.001	0.001	0.003	0.018	0.035	0.042	0.047	53
Nitrite as N mg/L	0.001	0.001	0.005	0.009	0.010	0.014	0.014	20
Nitrogen (Total) as N mg/L	0.17	0.21	0.25	0.29	0.32	0.33	0.35	57
Phosphorus (Total) as P mg/L	0.01	0.01	0.02	0.03	0.03	0.04	0.04	57
DRP as P mg/L	0.002	0.003	0.005	0.006	0.010	0.013	0.014	33
Silica as Si mg/L	0.3	0.7	1.0	1.7	2.7	2.8	3.1	33

*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)	7.6	8.3	9.0	10.6	11.3	11.5	11.6	33
Dissolved Oxygen (%)	87.1	87.4	88.7	94.3	98.0	99.6	101.6	33
Salinity (PPT)	2.4	4.0	5.4	9.5	19.8	30.7	33.0	33
Field Cond@TRef25 (mS/cm)	7.3	7.3	12.5	16.3	32.4	49.0	52.2	21
pH field - sensor TC	7.0	7.2	7.4	7.7	7.9	8.1	8.2	32
Temperature (Celsius)	6.3	6.7	7.0	8.7	9.5	11.1	12.0	33
Turbidity (NTU)	1.0	1.7	3.6	7.8	12.4	18.2	19.2	17
Redox (mV)	131	154	187	292	435	473	475	21
Chlorophyll a (µg/L)*	0.3	0.3	0.3	0.3	0.6	0.7	1.0	30
TAN as N (mg/L)	0.009	0.009	0.010	0.012	0.015	0.015	0.017	32
Nitrite and Nitrate as N mg/L	0.021	0.024	0.026	0.030	0.056	0.065	0.068	15
Nitrate as N mg/L	0.015	0.015	0.019	0.026	0.040	0.049	0.056	32
Nitrite as N mg/L	0.003	0.003	0.004	0.004	0.005	0.005	0.007	11
Nitrogen (Total) as N mg/L	0.19	0.20	0.21	0.25	0.31	0.34	0.36	33
Phosphorus (Total) as P mg/L	0.01	0.01	0.01	0.01	0.02	0.02	0.03	33
DRP as P mg/L	0.003	0.003	0.004	0.005	0.007	0.010	0.010	21
Silica as Si mg/L	1.7	2.1	2.4	2.7	3.1	3.3	3.3	21

*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)	7.0	7.6	8.1	9.1	10.2	10.3	10.9	29
Dissolved Oxygen (%)	87.1	91.1	92.5	97.1	100.1	103.2	104.8	29
Salinity (PPT)	3.6	6.9	10.0	14.5	21.9	32.7	34.1	29
Field Cond@TRef25 (mS/cm)	12.2	13.4	17.9	23.3	38.6	50.2	51.4	18
pH field - sensor TC	7.3	7.4	7.5	7.8	8.0	8.1	8.2	26
Temperature (Celsius)	9.1	10.1	11.3	13.1	15.6	16.8	18.3	29
Turbidity (NTU)	1.2	1.5	2.1	3.9	6.7	8.0	8.7	15
Redox (mV)	54	91	122	406	447	455	469	17
Chlorophyll a (µg/L)*	0.1	0.3	0.5	1.5	3.0	4.6	5.5	29
TAN as N (mg/L)	0.003	0.005	0.005	0.009	0.012	0.013	0.018	28
Nitrite and Nitrate as N mg/L	0.002	0.003	0.003	0.013	0.025	0.026	0.072	11
Nitrate as N mg/L	0.001	0.001	0.001	0.008	0.014	0.019	0.023	27
Nitrite as N mg/L	0.001	0.001	0.001	0.002	0.003	0.004	0.004	8
Nitrogen (Total) as N mg/L	0.15	0.18	0.18	0.22	0.25	0.29	0.32	29
Phosphorus (Total) as P mg/L	0.01	0.01	0.01	0.02	0.02	0.02	0.03	29
DRP as P mg/L	0.002	0.002	0.003	0.004	0.005	0.008	0.010	20
Silica as Si mg/L	0.7	1.5	2.1	2.6	3.4	4.0	5.1	20

*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)	4.8	5.0	5.5	6.5	7.1	7.6	8.0	143
Dissolved Oxygen (%)	58.1	62.6	68.4	77.9	85.0	90.3	95.1	143
Salinity (PPT)	32.9	33.8	34.4	35.0	35.8	36.2	37.0	140
Field Cond@TRef25 (mS/cm)	50.5	52.0	52.8	53.9	54.7	55.8	56.8	84
pH field - sensor TC	7.5	7.6	7.7	8.0	8.1	8.2	8.2	124
Temperature (Celsius)	11.6	11.9	12.4	14.6	16.5	17.2	17.9	143
Turbidity (NTU)	0.3	0.5	0.8	3.3	9.2	10.9	13.3	49
Redox (mV)	-53	35	104	406	451	478	487	86
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)	5.0	5.3	5.8	6.4	7.2	7.5	8.1	34
Dissolved Oxygen (%)	64.3	69.2	72.2	80.1	90.2	95.0	100.6	34
Salinity (PPT)	32.5	33.0	33.7	34.7	35.2	35.7	35.9	32
Field Cond@TRef25 (mS/cm)	47.8	49.8	51.1	52.9	54.1	54.5	55.8	20
pH field - sensor TC	7.3	7.6	7.8	8.0	8.1	8.2	8.2	26
Temperature (Celsius)	14.5	14.6	15.0	16.5	17.9	18.4	18.9	34
Turbidity (NTU)	0.5	0.7	1.4	1.7	8.0	10.0	25.2	13
Redox (mV)	2	23	35	401	445	454	503	20
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)	4.4	4.7	4.9	5.7	6.4	6.6	6.9	50
Dissolved Oxygen (%)	55.4	57.7	62.2	70.4	78.4	81.6	82.9	50
Salinity (PPT)	34.2	34.7	34.8	35.1	36.1	36.3	37.1	49
Field Cond@TRef25 (mS/cm)	52.9	52.9	53.1	54.3	54.9	56.6	57.1	28
pH field - sensor TC	7.6	7.7	7.7	8.0	8.0	8.1	8.2	43
Temperature (Celsius)	13.5	14.0	14.6	15.9	16.6	17.0	17.5	50
Turbidity (NTU)	0.5	0.7	1.4	7.4	9.5	10.3	12.3	10
Redox (mV)	-982	-860	104	400	451	467	689	31
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)	6.4	6.5	6.7	6.9	7.1	7.3	7.5	30
Dissolved Oxygen (%)	74.8	75.7	77.5	80.7	82.8	85.0	85.4	30
Salinity (PPT)	34.4	34.6	34.7	35.1	35.9	36.3	37.0	30
Field Cond@TRef25 (mS/cm)	52.6	53.1	53.3	54.1	54.8	55.7	56.2	18
pH field - sensor TC	7.4	7.6	7.7	7.9	8.1	8.1	8.1	29
Temperature (Celsius)	10.4	10.8	11.7	12.3	13.1	13.5	13.7	30
Turbidity (NTU)	0.2	0.2	0.5	4.7	11.4	11.9	14.7	12
Redox (mV)	125	144	165	365	463	480	484	18
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)	5.6	5.9	6.2	7.1	7.8	8.1	8.4	29
Dissolved Oxygen (%)	67.7	68.4	72.7	81.6	92.6	96.7	98.9	29
Salinity (PPT)	32.7	33.3	34.0	35.0	35.8	35.9	36.7	29
Field Cond@TRef25 (mS/cm)	51.7	52.1	52.4	53.9	54.2	55.0	56.1	18
pH field - sensor TC	7.5	7.6	7.7	8.0	8.2	8.2	8.2	26
Temperature (Celsius)	11.5	11.7	12.1	12.7	13.6	14.1	14.4	29
Turbidity (NTU)	0.5	0.7	0.9	2.2	6.9	7.3	8.1	14
Redox (mV)	47	91	115	415	456	473	495	17
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)	4.5	4.8	5.2	6.3	7.1	7.3	7.6	143
Dissolved Oxygen (%)	56.3	59.2	65.3	77.1	83.1	85.9	89.5	143
Salinity (PPT)	33.8	34.2	34.7	35.1	35.9	36.2	37.1	140
Field Cond@TRef25 (mS/cm)	51.9	52.5	53.0	54.1	54.7	55.9	56.8	84
pH field - sensor TC	7.5	7.6	7.7	7.9	8.1	8.1	8.2	124
Temperature (Celsius)	11.6	11.9	12.4	14.5	16.4	17.2	17.7	143
Turbidity (NTU)	0.5	0.8	1.0	4.1	10.1	10.9	15.3	48
Redox (mV)	-57	32	101	408	451	478	487	86
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.004	0.007	0.012	0.023	0.030	0.037	133
Nitrite and Nitrate as N mg/L	0.003	0.003	0.012	0.047	0.068	0.074	0.075	51
Nitrate as N mg/L	0.002	0.003	0.009	0.032	0.059	0.064	0.066	134
Nitrite as N mg/L	0.001	0.001	0.001	0.005	0.013	0.016	0.022	38
Nitrogen (Total) as N mg/L	0.19	0.22	0.25	0.31	0.36	0.38	0.40	144
Phosphorus (Total) as P mg/L	0.03	0.03	0.03	0.04	0.05	0.05	0.05	144
DRP as P mg/L	0.007	0.009	0.010	0.013	0.016	0.017	0.019	96
Silica as Si mg/L	0.2	0.3	0.4	0.4	0.6	0.7	0.7	96

*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)	4.8	5.0	5.4	6.2	6.8	7.2	7.3	34
Dissolved Oxygen (%)	62.4	65.1	69.0	78.2	85.7	88.3	89.7	34
Salinity (PPT)	34.0	34.1	34.2	34.8	35.4	35.8	35.9	32
Field Cond@TRef25 (mS/cm)	49.8	51.8	52.0	53.1	54.2	54.6	56.0	20
pH field - sensor TC	7.5	7.6	7.8	8.0	8.1	8.1	8.2	26
Temperature (Celsius)	14.1	14.5	14.6	16.4	17.4	18.1	18.5	34
Turbidity (NTU)	0.7	1.0	1.5	6.4	9.9	10.3	20.7	12
Redox (mV)	2	20	32	403	445	454	503	20
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.002	0.003	0.007	0.012	0.021	0.025	0.035	30
Nitrite and Nitrate as N mg/L	0.001	0.001	0.002	0.003	0.009	0.014	0.018	9
Nitrate as N mg/L	0.001	0.001	0.002	0.004	0.014	0.017	0.021	30
Nitrite as N mg/L	0.001	0.001	0.001	0.001	0.001	0.003	0.006	8
Nitrogen (Total) as N mg/L	0.15	0.18	0.22	0.26	0.33	0.36	0.37	34
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.03	0.04	0.05	0.05	34
DRP as P mg/L	0.005	0.005	0.007	0.010	0.013	0.014	0.017	22
Silica as Si mg/L	0.2	0.3	0.4	0.5	0.6	0.7	0.7	22

*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)	4.0	4.3	4.7	5.4	6.3	6.5	6.6	50
Dissolved Oxygen (%)	50.4	55.9	58.7	66.6	78.3	80.5	82.1	50
Salinity (PPT)	34.6	34.7	34.9	35.1	36.1	36.4	37.2	49
Field Cond@TRef25 (mS/cm)	52.9	53.0	53.2	54.4	55.0	56.6	57.3	28
pH field - sensor TC	7.6	7.7	7.7	7.9	8.0	8.1	8.2	43
Temperature (Celsius)	13.7	14.2	14.6	15.9	16.5	16.9	17.5	50
Turbidity (NTU)	0.7	0.8	1.8	6.2	9.9	10.3	13.6	11
Redox (mV)	-990	-892	98	403	451	467	688	31
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.005	0.008	0.013	0.019	0.027	0.032	46
Nitrite and Nitrate as N mg/L	0.006	0.011	0.029	0.049	0.069	0.071	0.075	19
Nitrate as N mg/L	0.006	0.015	0.020	0.032	0.056	0.063	0.065	47
Nitrite as N mg/L	0.001	0.002	0.007	0.013	0.019	0.023	0.026	14
Nitrogen (Total) as N mg/L	0.23	0.27	0.29	0.32	0.37	0.39	0.41	51
Phosphorus (Total) as P mg/L	0.03	0.03	0.04	0.04	0.05	0.05	0.06	51
DRP as P mg/L	0.011	0.011	0.012	0.014	0.017	0.019	0.019	33
Silica as Si mg/L	0.4	0.4	0.4	0.5	0.6	0.7	0.7	33

*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	6.4	6.7	7.0	7.3	7.4	7.5	30
Dissolved Oxygen (%)	75.4	76.4	77.8	81.2	83.5	85.3	86.4	30
Salinity (PPT)	34.5	34.6	34.7	35.1	35.9	36.3	37.1	30
Field Cond@TRef25 (mS/cm)	52.7	53.2	53.4	54.2	54.8	55.8	56.2	18
pH field - sensor TC	7.3	7.7	7.7	7.9	8.1	8.1	8.1	29
Temperature (Celsius)	10.4	10.8	11.8	12.3	13.2	13.5	13.7	30
Turbidity (NTU)	0.5	0.7	1.1	8.6	11.1	12.4	15.3	11
Redox (mV)	121	142	154	365	464	480	483	18
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.003	0.004	0.009	0.013	0.014	0.015	29
Nitrite and Nitrate as N mg/L	0.055	0.063	0.063	0.066	0.075	0.075	0.076	12
Nitrate as N mg/L	0.044	0.047	0.052	0.060	0.065	0.068	0.069	29
Nitrite as N mg/L	0.004	0.005	0.005	0.008	0.010	0.012	0.013	8
Nitrogen (Total) as N mg/L	0.22	0.24	0.28	0.32	0.36	0.38	0.41	30
Phosphorus (Total) as P mg/L	0.03	0.03	0.03	0.04	0.04	0.05	0.05	30
DRP as P mg/L	0.010	0.011	0.012	0.014	0.015	0.016	0.016	21
Silica as Si mg/L	0.3	0.3	0.3	0.4	0.4	0.5	0.7	21

*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)	4.9	5.4	5.8	6.8	7.5	7.8	7.9	29
Dissolved Oxygen (%)	58.2	62.9	67.7	80.3	86.1	91.5	91.9	29
Salinity (PPT)	33.3	33.7	34.1	35.2	35.8	36.0	36.9	29
Field Cond@TRef25 (mS/cm)	52.4	53.0	53.2	54.1	54.4	55.2	56.2	18
pH field - sensor TC	7.5	7.6	7.7	8.0	8.2	8.2	8.2	26
Temperature (Celsius)	11.5	11.6	12.0	12.5	13.3	13.7	14.2	29
Turbidity (NTU)	0.6	0.8	0.9	2.6	5.4	7.1	8.4	14
Redox (mV)	44	89	110	412	457	472	494	17
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.006	0.007	0.010	0.024	0.034	0.040	0.044	28
Nitrite and Nitrate as N mg/L	0.011	0.019	0.019	0.039	0.050	0.057	0.063	11
Nitrate as N mg/L	0.004	0.005	0.015	0.033	0.042	0.049	0.061	28
Nitrite as N mg/L	0.002	0.003	0.003	0.003	0.005	0.005	0.005	8
Nitrogen (Total) as N mg/L	0.20	0.22	0.27	0.30	0.35	0.37	0.37	29
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.04	0.05	0.05	0.05	29
DRP as P mg/L	0.006	0.008	0.009	0.013	0.015	0.016	0.017	20
Silica as Si mg/L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	20

*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)	4.6	4.9	5.4	6.4	7.1	7.4	7.8	286
Dissolved Oxygen (%)	57.2	61.1	66.6	77.7	83.5	88.2	92.4	286
Salinity (PPT)	33.4	34.0	34.5	35.1	35.9	36.2	37.1	280
Field Cond@TRef25 (mS/cm)	51.6	52.2	52.9	54.0	54.7	55.9	56.9	168
pH field - sensor TC	7.5	7.6	7.7	7.9	8.1	8.2	8.2	248
Temperature (Celsius)	11.6	11.9	12.4	14.6	16.4	17.2	17.8	286
Turbidity (NTU)	0.4	0.6	0.8	3.8	9.7	10.9	14.8	97
Redox (mV)	-63	32	103	408	451	478	487	172
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.004	0.007	0.012	0.023	0.030	0.037	133
Nitrite and Nitrate as N mg/L	0.003	0.003	0.012	0.047	0.068	0.074	0.075	51
Nitrate as N mg/L	0.002	0.003	0.009	0.032	0.059	0.064	0.066	134
Nitrite as N mg/L	0.001	0.001	0.001	0.005	0.013	0.016	0.022	38
Nitrogen (Total) as N mg/L	0.19	0.22	0.25	0.31	0.36	0.38	0.40	144
Phosphorus (Total) as P mg/L	0.03	0.03	0.03	0.04	0.05	0.05	0.05	144
DRP as P mg/L	0.007	0.009	0.010	0.013	0.016	0.017	0.019	96
Silica as Si mg/L	0.2	0.3	0.4	0.4	0.6	0.7	0.7	96

*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	5.1	5.5	6.3	7.0	7.4	7.6	68
Dissolved Oxygen (%)	63.3	65.2	69.7	79.4	88.2	91.0	95.0	68
Salinity (PPT)	32.6	33.7	34.1	34.7	35.3	35.8	35.9	64
Field Cond@TRef25 (mS/cm)	47.8	50.3	51.8	53.0	54.2	54.5	56.0	40
pH field - sensor TC	7.4	7.6	7.8	8.0	8.1	8.1	8.2	52
Temperature (Celsius)	14.4	14.5	14.8	16.4	17.6	18.4	18.7	68
Turbidity (NTU)	0.5	0.7	1.5	5.8	8.9	10.4	28.9	25
Redox (mV)	2	20	34	403	445	454	503	40
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.002	0.003	0.007	0.012	0.021	0.025	0.035	30
Nitrite and Nitrate as N mg/L	0.001	0.001	0.002	0.003	0.009	0.014	0.018	9
Nitrate as N mg/L	0.001	0.001	0.002	0.004	0.014	0.017	0.021	30
Nitrite as N mg/L	0.001	0.001	0.001	0.001	0.001	0.003	0.006	8
Nitrogen (Total) as N mg/L	0.15	0.18	0.22	0.26	0.33	0.36	0.37	34
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.03	0.04	0.05	0.05	34
DRP as P mg/L	0.005	0.005	0.007	0.010	0.013	0.014	0.017	22
Silica as Si mg/L	0.2	0.3	0.4	0.5	0.6	0.7	0.7	22

*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)	4.2	4.5	4.8	5.6	6.3	6.5	6.8	100
Dissolved Oxygen (%)	52.4	56.9	60.1	68.6	78.3	81.2	82.4	100
Salinity (PPT)	34.2	34.7	34.8	35.1	36.1	36.4	37.5	98
Field Cond@TRef25 (mS/cm)	52.9	52.9	53.2	54.4	55.0	56.7	57.3	56
pH field - sensor TC	7.6	7.7	7.7	7.9	8.0	8.1	8.2	86
Temperature (Celsius)	13.6	14.0	14.6	15.9	16.6	17.0	17.6	100
Turbidity (NTU)	0.6	0.7	1.6	6.2	9.9	10.3	14.3	21
Redox (mV)	-998	-889	99	402	451	467	879	62
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.005	0.008	0.013	0.019	0.027	0.032	46
Nitrite and Nitrate as N mg/L	0.006	0.011	0.029	0.049	0.069	0.071	0.075	19
Nitrate as N mg/L	0.006	0.015	0.020	0.032	0.056	0.063	0.065	47
Nitrite as N mg/L	0.001	0.002	0.007	0.013	0.019	0.023	0.026	14
Nitrogen (Total) as N mg/L	0.23	0.27	0.29	0.32	0.37	0.39	0.41	51
Phosphorus (Total) as P mg/L	0.03	0.03	0.04	0.04	0.05	0.05	0.06	51
DRP as P mg/L	0.011	0.011	0.012	0.014	0.017	0.019	0.019	33
Silica as Si mg/L	0.4	0.4	0.4	0.5	0.6	0.7	0.7	33

*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)	6.4	6.4	6.7	7.0	7.2	7.4	7.5	60
Dissolved Oxygen (%)	75.2	75.7	77.5	81.1	83.3	85.3	85.5	60
Salinity (PPT)	34.4	34.6	34.7	35.1	35.9	36.3	37.1	60
Field Cond@TRef25 (mS/cm)	52.6	53.1	53.3	54.1	54.8	55.8	56.3	36
pH field - sensor TC	7.3	7.6	7.7	7.9	8.1	8.1	8.2	58
Temperature (Celsius)	10.2	10.8	11.7	12.3	13.2	13.5	13.8	60
Turbidity (NTU)	0.2	0.2	0.7	7.3	11.4	12.3	17.5	23
Redox (mV)	121	139	155	365	474	481	484	36
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.003	0.003	0.004	0.009	0.013	0.014	0.015	29
Nitrite and Nitrate as N mg/L	0.055	0.063	0.063	0.066	0.075	0.075	0.076	12
Nitrate as N mg/L	0.044	0.047	0.052	0.060	0.065	0.068	0.069	29
Nitrite as N mg/L	0.004	0.005	0.005	0.008	0.010	0.012	0.013	8
Nitrogen (Total) as N mg/L	0.22	0.24	0.28	0.32	0.36	0.38	0.41	30
Phosphorus (Total) as P mg/L	0.03	0.03	0.03	0.04	0.04	0.05	0.05	30
DRP as P mg/L	0.010	0.011	0.012	0.014	0.015	0.016	0.016	21
Silica as Si mg/L	0.3	0.3	0.3	0.4	0.4	0.5	0.7	21

*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)	5.0	5.6	6.0	7.0	7.7	8.0	8.2	58
Dissolved Oxygen (%)	59.0	66.4	70.8	81.0	88.6	92.7	96.7	58
Salinity (PPT)	32.8	33.6	34.0	35.0	35.8	36.0	37.2	58
Field Cond@TRef25 (mS/cm)	51.6	52.3	53.0	54.1	54.3	55.4	56.3	36
pH field - sensor TC	7.5	7.6	7.7	8.0	8.2	8.2	8.2	52
Temperature (Celsius)	11.4	11.6	12.0	12.6	13.4	14.1	14.5	58
Turbidity (NTU)	0.4	0.8	0.8	2.2	6.7	7.3	8.9	28
Redox (mV)	26	82	112	414	458	480	499	34
Chlorophyll a (µg/L)*					ND			
TAN as N (mg/L)	0.006	0.007	0.010	0.024	0.034	0.040	0.044	28
Nitrite and Nitrate as N mg/L	0.011	0.019	0.019	0.039	0.050	0.057	0.063	11
Nitrate as N mg/L	0.004	0.005	0.015	0.033	0.042	0.049	0.061	28
Nitrite as N mg/L	0.002	0.003	0.003	0.003	0.005	0.005	0.005	8
Nitrogen (Total) as N mg/L	0.20	0.22	0.27	0.30	0.35	0.37	0.37	29
Phosphorus (Total) as P mg/L	0.02	0.03	0.03	0.04	0.05	0.05	0.05	29
DRP as P mg/L	0.006	0.008	0.009	0.013	0.015	0.016	0.017	20
Silica as Si mg/L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	20

*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	7.0	10.1	83.7	97.3	29.3	45.2	7.5	8.0	9.4	17.9	10.6	441	2.3	15.0	46.0	30.0	9.0	0.31	0.03	8.0	2.9
Summer	6.9	8.2	84.9	95.0	27.6	41.8	7.5	8.0	16.9	20.6	18.4~	440	2.8	9.0	4.0~	1.0	2.0~	0.28	0.03	4.0	2.7
Autumn	6.6	9.1	79.6	92.2	31.6	48.2	7.5	8.0	12.5	16.7	9.2	437	2.0	17.0	50.0	35.0	10.0	0.32	0.03	1.0	2.7
Winter	9.0	11.3	88.7	98.0	19.8	32.4	7.4	7.9	7.0	9.5	12.4	435	0.6	15.0	56.0	40.0	5.0~	0.31	0.02	7.0	3.1
Spring	8.1	10.2	92.5	100.1	21.9	38.6	7.5	8.0	11.3	15.6	6.7	447	3.0	12.0	25.0	14.0	3.0~	0.25	0.02	5.0	3.4

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), ~ <95% confidence. 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	5.5	7.1	68.4	85.0	35.8	54.7	7.7	8.1	12.4	16.5	9.2	451	ND	ND	ND	ND	ND	ND	ND	ND	ND
Summer	5.8	7.2	72.2	90.2	35.2	54.1	7.8	8.1	15.0	17.9	8.0~	445	ND	ND	ND	ND	ND	ND	ND	ND	ND
Autumn	4.9	6.4	62.2	78.4	36.1	54.9	7.7	8.0	14.6	16.6	9.5~	451	ND	ND	ND	ND	ND	ND	ND	ND	ND
Winter	6.7	7.1	77.5	82.8	35.9	54.8	7.7	8.1	11.7	13.1	11.4~	463	ND	ND	ND	ND	ND	ND	ND	ND	ND
Spring	6.2	7.8	72.7	92.6	35.8	54.2	7.7	8.2	12.1	13.6	6.9	456	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, ~ <95% confidence. 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	5.2	7.1	65.3	83.1	35.9	54.7	7.7	8.1	12.4	16.4	10.1	451	ND	23.0	68.0	59.0	13.0	0.36	0.05	16.0	0.6
Summer	5.4	6.8	69.0	85.7	35.4	54.2	7.8	8.1	14.6	17.4	9.9~	445	ND	21.0	9.0~	14.0	1.0~	0.33	0.04	13.0	0.6
Autumn	4.7	6.3	58.7	78.3	36.1	55.0	7.7	8.0	14.6	16.5	9.9~	451	ND	19.0	69.0	56.0	19.0	0.37	0.05	17.0	0.6
Winter	6.7	7.3	77.8	83.5	35.9	54.8	7.7	8.1	11.8	13.2	11.1~	464	ND	13.0	75.0~	65.0	10.0~	0.36	0.04	15.0	0.4
Spring	5.8	7.5	67.7	86.1	35.8	54.4	7.7	8.2	12.0	13.3	5.4	457	ND	34.0	50.0~	42.0	5.0~	0.35	0.05	15.0	0.5

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, ~ <95% confidence. Figures shown above are based on data collected from 18/03/2009 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	5.4	7.1	66.6	83.5	35.9	54.7	7.7	8.1	12.4	16.4	9.7	451	ND	23.0	68.0	59.0	13.0	0.36	0.05	16.0	0.6
Summer	5.5	7.0	69.7	88.2	35.3	54.2	7.8	8.1	14.8	17.6	8.9	445	ND	21.0	9.0~	14.0	1.0~	0.33	0.04	13.0	0.6
Autumn	4.8	6.3	60.1	78.3	36.1	55.0	7.7	8.0	14.6	16.6	9.9	451	ND	19.0	69.0	56.0	19.0	0.37	0.05	17.0	0.6
Winter	6.7	7.2	77.5	83.3	35.9	54.8	7.7	8.1	11.7	13.2	11.4	474	ND	13.0	75.0~	65.0	10.0~	0.36	0.04	15.0	0.4
Spring	6.0	7.7	70.8	88.6	35.8	54.3	7.7	8.2	12.0	13.4	6.7	458	ND	34.0	50.0~	42.0	5.0~	0.35	0.05	15.0	0.5

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.