23 November 2009 – Track changes as a result of the supplementary officers report for water – Pink version

Notes for track changes. Recommendations made by the Historic Heritage officer are shown in Blue. Recommendations made by the Water officer are shown in Green. Recommendations made by the Supplementary Officers Report for water are shown in Red. Sentences shown in ~~black~~ strikethrough or are recommended within the Officer's Report to be relocated to other parts of the document, those sentences that have been relocated are shown in black underline. Words recommended to be added are shown in underline, words recommended to be removed are shown in ~~strike through~~

Terms defined within the Proposed One Plan glossary are *italicised* and marked with an asterisk (*) symbol. Terms defined in the Resource Management Act 1991 are *italicised* and marked with a caret (^) symbol.

Schedule D: Surface *Water*^ Quality Standards[1]

3 SCHEDULE D TABLE OF CONTENTS:

USER GUIDE: How to use the contents of the schedule
Step 1: Identify which WMSZ your proposed activity lies in (go to Part 1 of Schedule Ba)
Step 2*:* Review the VALUES your WMSZ is being managed for (go to Part 2 of Schedule Ba)
Step 3: Identify which Standards apply to your activity using steps a - c:

a. A *river*^ or stream:
   i. Turn first to Table D1a – Region-Wide *Water*^ Quality Standards to see the standards that apply to all natural *river*^ and stream waters in the region.
   ii. Then turn to Table D2a – *Water*^ Quality Standards By Sub-Zone and review the numerical standards that have been set to maintain the various values assigned to the *rivers*^ and streams in your WMSZ
   iii. If the *water body** at the site of your proposed activity is identified for Trout Spawning, turn to Table D3a: Additional *Water*^ Quality Standards for *Rivers*^ and Streams managed for Trout Spawning, to see additional standards that apply from 1 May to 30 September (inclusive).
b. A natural *lake*^:
   i. Turn to Table E.2(b) to determine if your lake is excluded from this description by clauses iv to ix

[1] Note: All water body values, management objectives, water management zones, sub-zones and associated maps and tables have been removed from Schedule D and are now found in Schedule Ba (Rivers, streams and lakes) and Schedule H (Coastal Marine Area) of the track changed version of the Plan presented in the Officer's report.

ii. If your lake is not excluded by Table E.2(b) iv to ix then turn to Table D4a: - Lake Water Quality Standards
iii. Determine if the lake meets the description of a “deep” or “shallow” *lake*^ from the footnote of Table D4a and see the standards that apply to the *lake*^ *water*^ in Table D4a.

c. *Water bodies** in the *Coastal Marine Area*^ (i.e. the sea and estuarine zones of *rivers*^ and streams):
i. Turn to Tables H:4a - H:7a in Schedule H to see the standards that apply to waters in the *Coastal Marine Area*^.

USER NOTE: For table abbreviations – please refer to the fold-out A3 **STANDARDS KEY** at the back of this schedule.

D1: Standards that apply to all natural streams and *rivers*^

~~Additional Water quality standards~~

~~**Additional standards applying to all natural stream and river waters:**~~

1. ~~The concentration of *Escherichia coli* when the river or stream flow is at or below median flow shall not exceed 260 per 100 millilitres. This standard applies during the period 1st November to 30th April inclusive, and~~
2. ~~The concentration of *Escherichia coli* when the river or stream flow is at or below three times median flow shall not exceed 550 per 100 millilitres. This standard applies year round.~~
3. ~~The concentration of toxins due to cyanobacteria (blue-green algae) shall not exceed 20 milligrams per cubic metre. This standard applies year round.~~

Table D:1a Region-wide *Water*^ Quality Standards that apply to all natural streams and *rivers*^:[2]

Management Zone	Sub-Zone	*E.coli* / 100 ml		Periphyton Cover	Diatom or Cyanobacterial Cover	QMCI ~~%~~Δ[3]
		< 50th %ile	< 20th%ile			
All *Water Management Zones**	All Water Management Sub-Zones	260	550	30%	60%	~~20~~ No Statistically significant reduction

[2] Note that this is not new information, just the Additional Water Quality Standards placed in table format

[3] This standard is only relevant for measuring the ~~percentage~~ degree of change in Quantitative Macroinvertebrate Community Index (QMCI) between appropriately matched habitats upstream and downstream of activities, such as discharges to water, for the purposes of measuring the effect of *discharges*^ on aquatic macroinvertebrate communities, it is not an appropriate standard for the measurement of the general state of macroinvertebrate communities in each Water Management Sub-zone.

Schedule D: Standards – By Water Management Sub-zone

~~Table D.17:~~ ~~Water quality standards for rivers and streams in each Water Management Sub-zone (Note: refer to and for water quality standards applying to rivers and streams flowing into natural lakes)~~

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (~~m~~g/m^3)	SIN (~~m~~g/m^3)	QMCI[4]	Ammoniacal Nitrogen (~~m~~g/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	~~Chla~~ Chl a (mg/m^2)	~~%~~ cover	<	<	[3]	<	Max	%	~~<1/2 m~~	~~< m~~	~~< 3 xm~~	~~Δ~~	< 50th %ile	%Δ
Upper Manawatu (Mana_1)	Upper Manawatu (Mana_1a)	7 to 8.5	0.5	19	3	80	~~1~~ 1.5	~~2.5~~ 5	120	~~30~~	~~10~~ 0.010	~~167~~ 0.167	~~6~~ 120	~~400~~ 0.400	2.1	99	~~1~~		~~15~~	~~20~~	3	20
	Mangatewainui (Mana_1b)	7 to 8.5	0.5	19	3	80	~~1~~ 1.5	~~2.5~~ 5	120	~~30~~	~~10~~ 0.010	~~167~~ 0.167	~~6~~ 120	~~400~~ 0.400	2.1	99	~~1~~		~~15~~	~~20~~	3	20
	Mangatoro (Mana_1c)	7 to 8.5	0.5	19	3	80	~~1~~ 1.5	~~2.5~~ 5	120	~~30~~	~~10~~ 0.010	~~110~~ 0.110	~~6~~ 120	~~400~~ 0.400	2.1	99	~~1~~		~~20~~	~~20~~	3	20
Weber-Tamaki (Mana_2)	Weber-Tamaki (Mana_2a)	7 to 8.5	0.5	19	2	80	~~1~~ 1.5	~~2.5~~ 5	120	~~30~~	~~10~~ 0.010	~~444~~ 0.444	~~6~~ 120	~~400~~ 0.400	2.1	99	~~1~~		~~15~~	~~20~~	3	20
	Mangatera (Mana_2b)	7 to 8.5	0.5	22	3	70	2	5	120	~~30~~	~~10~~ 0.010	~~444~~ 0.444	~~5~~ 100	~~400~~ 0.400	2.1	99			~~15~~	~~30~~	2.5	30
Upper Tamaki (Mana_3)	Upper Tamaki	7 to 8.2	0.5	19	2	80	~~1~~ 1.5	~~2.5~~ 5	50	~~30~~	~~6~~ 0.006	~~70~~ 0.070	~~6~~ 120	~~320~~ 0.320	1.7	99			~~5~~	~~20~~	3	20
Upper Kumeti (Mana_4)	Upper Kumeti	7 to 8.2	0.5	19	2	80	~~1~~ 1.5	~~2.5~~ 5	50	~~30~~	~~6~~ 0.006	~~70~~ 0.070	~~6~~ 120	~~320~~ 0.320	1.7	99			~~5~~	~~20~~	3	20
Tamaki-Hopelands (Mana_5)	Tamaki-Hopelands (Mana_5a)	7 to 8.5	0.5	19	3	80	~~1~~ 1.5	~~2.5~~ 5	120	~~30~~	~~10~~ 0.010	~~444~~ 0.444	~~6~~ 120	~~400~~ 0.400	2.1	99	~~1~~		~~15~~	~~20~~	3	20
	Lower Tamaki (Mana_5b)	7 to 8.5	0.5	22	3	70	2	5	120	~~30~~	~~10~~ 0.010	~~444~~ 0.444	~~5~~ 100	~~400~~ 0.400	2.1	99			~~15~~	~~30~~	2.5	30
	Lower Kumeti (Mana_5c)	7 to 8.5	0.5	22	3	70	2	5	120	~~30~~	~~10~~ 0.010	~~444~~ 0.444	~~5~~ 100	~~400~~ 0.400	2.1	99			~~15~~	~~30~~	2.5	30
	Oruakeretaki (Mana_5d)	7 to 8.5	0.5	22	3	70	2	5	120	~~30~~	~~10~~ 0.010	~~444~~ 0.444	~~5~~ 100	~~400~~ 0.400	2.1	99			~~15~~	~~30~~	2.5	30
	Raparapawai (Mana_5e)	7 to 8.5	0.5	22	3	70	2	5	120	~~30~~	~~10~~ 0.010	~~444~~ 0.444	~~5~~ 100	~~400~~ 0.400	2.1	99			~~15~~	~~30~~	2.5	30

~~4 The Macroinvertebrate Community Index (MCI) standard applies only for State of the Environment monitoring purposes to determine if the aquatic macroinvertebrate communities are adequate to provide for and maintain the values in each WMSZ, this standard is not appropriate for monitoring the effect of activities such as discharges to water on macroinvertebrate communities upstream and downstream of the activity.~~

5 Changes in temperature resulting from habitat improvement and/or riparian restoration are exempt from the temperature change standard.

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (mg/m^3)	SIN (mg/m^3)	QMCI[4]	Ammoniacal Nitrogen (mg/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	Chla Chl *a* (mg/m^2)	% cover	<	<	3	<	Max	%	<1/2 m	< m	< 3 xm	Δ	< 50th %ile	%Δ
Hopelands-Tiraumea (Mana_6)	Hopelands-Tiraumea	7 to 8.5	0.5	19	3	80	1 1.5	2.5 5	120	30	10 0.010	444 0.444	6 120	400 0.400	2.1	99	1		15	20	3	20
Tiraumea (Mana_7)	Upper Tiraumea (Mana_7a)	7 to 8.5	0.5	23	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95	2.5	20		30	2	30
	Lower Tiraumea (Mana_7b)	7 to 8.5	0.5	23	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95	2.5	20		30	2	30
	Mangaone River (Mana_7c)	7 to 8.5	0.5	23	3	70	2	5	200	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95		20		30	1.6	30
	Makuri (Mana_7d)	7 to 8.5	0.5	19	2	80	1 1.5	2.5 5	120	30	10 0.010	110 0.110	6 120	400 0.400	2.1	99	1		15	20	3	20
Mangatainoka (Mana_8)	Upper Mangatainoka (Mana_8a)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	1		5	20	3	20
	Middle Mangatainoka (Mana_8b)	7 to 8.5	0.5	19	3	80	1 1.5	2.5 5	120	30	10 0.010	444 0.444	6 120	400 0.400	2.1	99	1		15	20	3	20
	Lower Mangatainoka (Mana_8c)	7 to 8.5	0.5	19	3	80	1 1.5	2.5 5	120	30	10 0.010	444 0.444	6 120	400 0.400	2.1	99	1		15	20	3	20
	Makakahi (Mana_8d)	7 to 8.5	0.5	19	3	80	1 1.5	2.5 5	120	30	10 0.010	444 0.444	6 120	400 0.400	2.1	99	1		15	20	3	20
	Mangaramarama (Mana_8e)	7 to 8.5	0.5	22	3	70	2	5	200	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95		20		30	1.6	30
Upper Gorge (Mana_9)	Upper Gorge (Mana_9a)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Mangapapa (Mana_9b)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95			15	30	2.5	30
	Mangaatua (Mana_9c)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95			15	30	2.5	30
	Upper Mangahao (Mana_9d)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	167 0.167	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Lower Mangahao (Mana_9e)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (mg/m^3)	SIN (mg/m^3)	QMCI[4]	Ammoniacal Nitrogen (mg/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	Chla Chl a (mg/m^2)	% cover	<	<	3	<	Max	%	<1/2 m	< m	< 3 xm	Δ	< 50th %ile	%Δ
Middle Manawatu (Mana_10)	Middle Manawatu (Mana_10a)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Upper Pohangina (Mana_10b)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	120	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Middle Pohangina (Mana_10c)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Lower Pohangina (Mana_10d)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Aokautere (Mana_10e)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95			15	30	2.5	30
Lower Manawatu (Mana_11)	Lower Manawatu (Mana_11a)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Turitea (Mana_11b)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Kahuterawa (Mana_11c)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Upper Mangaone Stream (Mana_11d)	7 to 8.5	0.5	24	3	60	2	5	200	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95			15	30	2.5	30
	Lower Mangaone Stream (Mana_11e)	7 to 8.5	0.5	24	3	60	2	5	200	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95			15	30	2.5	30
	Main Drain (Mana_11f)	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	444 0.444	5 100	400 0.400	2.1	95			15	30	2.5	30
Oroua (Mana_12)	Upper Oroua (Mana_12a)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	167 0.167	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Middle Oroua (Mana_12b)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Lower Oroua (Mana_12c)	7 to 8.5	0.5	24	3	70	2	5	200	30	15 0.015	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (mg/m^3)	SIN (mg/m^3)	QMCI[4]	Ammoniacal Nitrogen (mg/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	Chla Chl *a* (mg/m^2)	% cover	<	<	3	<	Max	%	<1/2 m	< m	<3 xm	Δ	< 50th %ile	%Δ
	Kiwitea (Mana_12d)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
	Makino (Mana_12e)	7 to 8.5	0.5	24	3	70	2	5	120	30	15 0.015	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
Coastal Manawatu (Mana_13)	Coastal Manawatu (Mana_13a)	7 to 8.5	0.5	24	3	70	2	5	200	30	15 0.015	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Upper Tokomaru (Mana_13b)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Lower Tokomaru (Mana_13c)	7 to 8.5	0.5	24	3	70	2	5	120	30	10 0.010	444 0.444	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Mangaore (Mana_13d)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	165	5 100	400 0.400	2.1	95			15	30	2.5	30
	Koputaroa (Mana_13e)	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	444 0.444	5 100	400 0.400	2.1	95			15	30	2.5	30
	Foxton Loop (Mana_13f)	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	444 0.444	5 100	400 0.400	2.1	95			15	30	2.5	30
Upper Rangitikei (Rang_1)	Upper Rangitikei	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	0.6		3.5	20	3.4	20
Middle Rangitikei (Rang_2)	Middle Rangitikei (Rang_2a)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	0.6		3.5	20	3.4	20
	Pukeokahu – Mangaweka (Rang_2b)	7 to 8.5	0.5	19	3	80	1 1.5	2.5 5	120	30	10 0.010	110 0.110	6 120	320 0.320	1.7	99	0.6		3.5	20	3.4	20
	Upper Moawhango (Rang_2c)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Middle Moawhango (Rang_2d)	7 to 8.5	0.5	19	2	80	1 1.5	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Lower Moawhango (Rang_2e)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5	20		30	2	30
	Upper Hautapu (Rang_2f)	7 to 8.5	0.5	19	2	80	1 1.5	2.5 5	120	30	10 0.010	110 0.110	6 120	400 0.400	2.1	99	1		15	20	3	20

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (mg/m^3)	SIN (mg/m^3)	QMCI[4]	Ammoniacal Nitrogen (mg/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	Chla Chl a (mg/m^2)	% cover	<	<	3	<	Max	%	<1/2 m	< m	< 3 xm	Δ	< 50th %ile	%Δ
	Lower Hautapu (Rang_2g)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5	20		30	2	30
Lower Rangitikei (Rang_3)	Lower Rangitikei (Rang_3a)	7 to 8.5	0.5	19	3	80	1 1.5	2.5 5	120	30	10 0.010	110 0.110	6 120	400 0.400	2.1	99	1		15	20	3	20
	Makohine (Rang_3b)	7 to 8.5	0.5	22	3	70	2	5	200	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95		20		30	1.6	30
Coastal Rangitikei (Rang_4)	Coastal Rangitikei (Rang_4a)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Tidal Rangitikei (Rang_4b)	7 to 8.5	0.5	24	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Porewa (Rang_4c)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95		20		30	1.6	30
	Tutaenui (Rang_4d)	7 to 8.5	0.5	24	3	60	2	5	200	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95			15	30	2.5	30
Upper Whanganui (Whai_1)	Upper Whanganui	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
Cherry Grove (Whai_2)	Cherry Grove (Whai_2a)	7 to 8.5	0.5	19	2	80	1 1.5	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Upper Whakapapa (Whai_2b)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Lower Whakapapa (Whai_2c)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Piopiotea (Whai_2d)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Pungapunga (Whai_2e)	7 to 8.5	0.5	19	2	80	1 1.5	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Upper Ongarue (Whai_2f)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Lower Ongarue (Whai_2g)	7 to 8.5	0.5	19	2	80	1 1.5	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
Te Maire (Whai_3)	Te Maire	7 to 8.5	0.5	19	2	80	1 1.5	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (mg/m^3)	SIN (mg/m^3)	QMCI[4]	Ammoniacal Nitrogen (mg/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	Chla Chl *a* (mg/m^2)	% cover	<	<	[3]	<	Max	%	<1/2 m	< m	< 3 xm	Δ	< 50th %ile	%Δ
Middle Whanganui (Whai_4)	Middle Whanganui (Whai_4a)	7 to 8.5	0.5	19	2	80	1 1.5	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Upper Ohura (Whai_4b)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Lower Ohura (Whai_4c)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Retaruke (Whai_4d)	7 to 8.5	0.5	19	2	80	1 1.5	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
Pipiriki (Whai_5)	Pipiriki (Whai_5a)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5	20		30	2	30
	Tangarakau (Whai_5b)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Whangamomona (Whai_5c)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Upper Manganui o te Ao (Whai_5d)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 .070	6 120	320 0.320	1.7	99	0.6		3.5	20	3.4	20
	Makatote (Whai_5e)	7 to 8.2	0.5	19	2	80	1.5	5	50		0.006	0.070	120	0.320	1.7	99					3.4	20
	Waimarino (Whai_5f)	7 to 8.2	0.5	19	2	80	1.5	5	50		0.006	0.070	120	0.320	1.7	99					3.4	20
	Middle Manganui o te Ao (Whai_5g)	7 to 8.2	0.5	19	2	80	1.5	5	50		0.006	0.070	120	0.320	1.7	99					3.4	20
	Mangaturuturu (Whai_5h)	7 to 8.2	0.5	19	2	80	1.5	5	50		0.006	0.070	120	0.320	1.7	99					3.4	20
	Lower Manganui o te Ao (Whai_5ei)	7 to 8.5	0.5	19	2	80	1 1.5	2.5 5	120	30	10 0.010	110 0.110	6 120	320 0.320	1.7	99	0.6		3.5	20	3.4	20
	Orautoha (Whai_5j)	7 to 8.5	0.5	19	2	80	1.5	5	120		0.010	0.110	120	0.320	1.7	99					3.4	20
Paetawa (Whai_6)	Paetawa	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5	20		30	2	30
Lower Whanganui (Whai_7)	Lower Whanganui (Whai_7a)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (mg/m^3)	SIN (mg/m^3)	QMCI[4]	Ammoniacal Nitrogen (mg/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	Chla Chl *a* (mg/m^2)	% cover	<	<	3	<	Max	%	<1/2 m	< m	< 3 xm	Δ	< 50th %ile	%Δ
	Coastal Whanganui (Whai_7b)	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Upokongaro (Whai_7c)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Matarawa (Whai_7d)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
Upper Whangaehu (Whau_1)	Upper Whangaehu (Whau_1a)	7 to 8.2[a]	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99			5[a]	20	3	20
	Waitangi (Whau_1b)	7 to 8.5	0.5	19	2	80	1 1.5	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
	Tokiahuru (Whau_1c)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
Middle Whangaehu (Whau_2)	Middle Whangaehu	7 to 8.5[a]	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20[a]		30	1.6	30
Lower Whangaehu (Whau_3)	Lower Whangaehu (Whau_3a)	7 to 8.5[a]	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20[a]		30	2	30
	Upper Makotuku (Whau_3b)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Lower Makotuku (Whau_3c)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Upper Mangawhero (Whau_3d)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Lower Mangawhero (Whau_3e)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5	20		30	2	30
	Makara (Whau_3f)	7 to 8.2	0.5	19	2	80	1.5	5	50		0.006	0.070	6 120	0.320	1.7	99					3	20
Coastal Whangaehu (Whau_4)	Coastal Whangaehu	7 to 8.5[a]	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20[a]		30	1.6	30
Turakina (Tura_1)	Upper Turakina (Tura_1a)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (mg/m^3)	SIN (mg/m^3)	QMCI[4]	Ammoniacal Nitrogen (mg/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	Chla Chl a (mg/m^2)	% cover	<	<	[3]	<	Max	%	<1/2 m	< m	< 3 xm	Δ	< 50th %ile	%Δ
	Lower Turakina (Tura_1b)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Ratana (Tura_1c)	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
Ohau (Ohau_1)	Upper Ohau (Ohau_1a)	7 to 8.2	0.5	19	2	80	1 1.5	2.5 5	50	30	6 0.006	70 0.070	6 120	320 0.320	1.7	99	2.5		5	20	3	20
	Lower Ohau (Ohau_1ba)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	110 0.110	5 100	400 0.400	2.1	95	2.5		15	30	2.5	30
Owahanga (Owha_1)	Owahanga	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
East Coast (East_1)	East Coast	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
Akitio (Akit_1)	Upper Akitio (Akit_1a)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Lower Akitio (Akit_1b)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
	Waihi (Akit_1c)	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
Northern Coastal (West_1)	Northern Coastal	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
Kai Iwi (West_2)	Kai Iwi	7 to 8.5	0.5	22	3	70	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95		20		30	1.6	30
Mowhanau (West_3)	Mowhanau	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
Kaitoke Lakes (West_4)	Kaitoke Lakes	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
Southern Whanganui Lakes (West_5)	Southern Whanganui Lakes	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
Northern Manawatu Lakes (West_6)	Northern Manawatu Lakes	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30

Table D.2a: Water Quality Standards for Rivers and Streams in each Water Management Sub-zone (Note: refer to Table D.4a for the water quality standards that apply to natural lakes):

Management Zone	Sub-zone	pH		Temp (°C)		DO (%SAT)	scBOD$_5$ (g/m^3)	POM (g/m^3)	Periphyton		DRP (mg/m^3)	SIN (mg/m^3)	QMCI[4]	Ammoniacal Nitrogen (mg/m^3)		Tox.	Turbidity (NTU)				Clarity (m)	
		Range	Δ	<	Δ[5]	>	<	<	Chla Chl a (mg/m^2)	% cover	<	<	3	<	Max	%	<1/2 m	< m	< 3 xm	Δ	< 50th %ile	%Δ
Waitarere (West_7)	Waitarere	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
Lake Papaitonga (West_8)	Lake Papaitonga	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
Waikawa (West_9)	Waikawa (West_9a)	7 to 8.5	0.5	22	3	70	2	5	120	30	10 0.010	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
	Manakau (West_9b)	7 to 8.5	0.5	22	3	70	2	5	120		0.010	0.167	100	0.400	2.1	95					2.5	30
Lake Horowhenua (Hoki_1)	Lake Horowhenua (Hoki_1a)	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30
	Hokio (Hoki_1b)	7 to 8.5	0.5	24	3	60	2	5	200	30	15 0.015	167 0.167	5 100	400 0.400	2.1	95			15	30	2.5	30

Schedule D Standards Trout Spawning

~~Additional water quality standards applying to the streams and rivers classified as Trout Spawning. The following standards apply to all streams where the TS (Trout Spawning) value is identified, from 1st May to 30 September inclusive.~~

1. ~~The temperature of the water shall not be changed by more than 2°C, and~~
2. ~~The temperature of the water shall not exceed 11°C, and~~
3. ~~The dissolved oxygen concentration shall not be less than 80% saturation, and~~
4. ~~There shall be no measurable increase in sediment or particulate organic matter deposited on the bed of the river or stream, and~~
5. ~~The concentration of toxicants in the water shall not exceed the trigger values defined in the 2000 ANZECC guidelines Table 3.4.1 with the level of protection of 99 % of species.~~

Table D:3a Additional *Water*^ Quality Standards that apply to all streams and *rivers*^ identified as being managed for the Trout Spawning (TS) value between 1 May and 30 September:[6]

Management Zone	Sub-Zone	Temp (°C)		DO* (%SAT)	Sediment or POM	Toxicants (%)
		≤	Δ	≥		
All *Water Management Zones** classified as being managed for Trout Spawning	All Water Management Sub-Zones classified as being managed for Trout Spawning (See Table Ba 19)	11	2	80	No measurable increase of deposited sediment or particulate organic matter (POM) on the *bed*^ of the *river*^ or stream	99

[6] This is not new information, just the Additional Water Quality Standards applying to stream and rivers classified as Trout Spawning put in table format for consistency

Schedule D Standards Natural *Lakes*^

~~Water quality standards for natural lakes and lake catchments~~

~~This part defines :~~

- ~~water management subzones where water quality standards for lakes and lake catchments are defined (Table D.18); and~~
- ~~water quality standard for natural lake waters, and~~
- ~~water quality standard for streams and rivers that flow into lakes (Table D.19 and Table D.20)~~

~~The following zones contain natural lakes:~~

~~Table D.18:~~ ~~Water Management Sub-zones where lake water and lake catchment water quality standards apply~~

~~West_1~~	~~Tura_1c~~	~~Mana_13a~~
~~Whai_7b~~	~~West_5~~	~~Hoki_1a~~
~~West_4~~	~~West_6~~	~~West_8~~
~~Whau_4~~	~~West_7~~	

~~Lowland lakes water quality standards. These standards apply year round to waters of all natural lakes within the water management subzones defined in Table D18.~~

1. ~~The pH of the water shall be within the range 7 to 8.5 and shall not be changed by more than 0.5 pH;~~
2. ~~The temperature of the water shall not be changed by more than 1°C;~~
3. ~~The Dissolved Oxygen concentration shall not be less than 80% in the surface waters (defined as less than 2 metres deep);~~
4. ~~The five-days Biological oxygen demand shall not exceed 1 g/m^3;~~
5. ~~The annual average algal biomass shall not exceed 5 mg Chlorophyll a/m^3 and no sample shall exceed 15 mg Chlorophyll a/m^3;~~
6. ~~The annual average total phosphorus concentration shall not exceed 20 mg/m^3;~~
7. ~~The annual average total nitrogen concentration shall not exceed 337 mg/m^3;~~
8. ~~The concentration of ammoniacal Nitrogen shall not exceed 337 mg/m^3;~~
9. ~~For toxicants not otherwise defined in these standards, the concentration of toxicants in the water shall not exceed the trigger values defined in the 2000 ANZECC guidelines Table 3.4.1 with the level of protection of 95 % of species;~~
10. ~~The clarity of the water measured as Secchi depth shall not be less than 2.8m and shall not be changed by more than 20%;~~
11. ~~The turbidity shall not be changed by more than 20%. This standard shall apply only when physical conditions existing at the site prevent adequate water clarity (Secchi Disc) measurement.~~
12. ~~The concentration of Escherichia coli shall not exceed 260 per 100 millilitres. This standard applies during the period 1st November to 30th April inclusive, and~~
13. ~~The concentration of Escherichia coli shall not exceed 550 per 100 millilitres. This standard applies during the period 1st May to 31th October inclusive year round.~~
14. ~~The concentration of toxins due to cyanobacteria (blue-green algae) shall not exceed 20 milligrams per cubic metre. This standard applies year round~~

Table D.19: The water quality standards defined in Table D.20 shall be read as follows (the numerical values in Table D.20 are indicated by […])

Column header	Column sub-header	Standard spelt out
pH	Range	The pH of the water shall be within the range […] to […]
	Δ	The pH of the water shall not be changed by more than
Temp (°C)	<	The temperature of the water shall not exceed […] degrees Celsius.
	Δ	The temperature of the water shall not be changed by more than […] degrees Celsius.
DO (%SAT)	<	The concentration of dissolved oxygen shall exceed […] % of saturation
BOD_5 (g/m^3)	<	The five-days biological oxygen demand shall not exceed […] grams per cubic metre.
POM (g/m^3)	<	The concentration of particulate organic matter shall not exceed […] grams per cubic metre.
Periphyton	Chla (mg/m^2)	The algal biomass on the stream or river bed shall not exceed […] milligrams of chlorophyll a per square metre.
	% cover	The maximum cover of visible stream or river bed by periphyton (as filamentous algae more than 2 centimetres long) shall not exceed […]% between 1st November to 30th April inclusive.
TP (mg/m^3)	<	The mean monthly concentration of total phosphorus shall not exceed […] milligrams per cubic metre, unless natural levels already exceed this standard.
TN (mg/m^3)	<	The mean monthly concentration of total nitrogen shall not exceed […] milligrams per cubic metre.
Ammonia (mg/m^3)	<	The concentration of ammonia nitrogen reactive phosphorus shall not exceed […] milligrams per cubic metre.
Toxicants	<	For toxicants not otherwise defined in these standards, the concentration of toxicants in the water shall not exceed the trigger values defined in the 2000 ANZECC guidelines Table 3.4.1 with the level of protection of […] % of species.
Turbidity (NTU)	< ½ m	The turbidity of the water when the river flow is at or below half median flow shall not exceed […] Nephlometric Turbidity Units (NTU)
	<m	The turbidity of the water when the river flow is at or below median flow shall not exceed […]Nephlometric Turbidity Units (NTU)
	<3 x m	The turbidity of the water when the river flow is at or below three times median flow shall not exceed […]Nephlometric Turbidity Units (NTU)
	Δ	The turbidity of the water shall not be changed by more than […] %
Clarity (m)	Δ	The clarity of the water measured as being the horizontal sighting range of a 200 mm black disc shall not be changed by more than […] %

Notes:

a. The pH change standard applies only within the bounds of the pH range standard
b. The temperature change standard applies only within the bounds of the temperature standard.
c. Soluble Inorganic Nitrogen (SIN) concentration is measured of the sum of nitrate nitrogen, nitrite nitrogen and ammonia nitrogen

Table D.20: The following water quality standards apply to streams and rivers in natural lakes catchments (ie., flowing directly or indirectly into a natural lake)

Management Zone	Management Sub-zone	pH		Temp (°C)		DO (%SAT)	BOD_5 (g/m^3)	POM (g/m^3)	Periphyton		TP (mg/m^3)	TN (mg/m^3)	Ammonia (mg/m^3)	Toxicants	Turbidity (NTU)				Clarity (m)
		Range	Δ	<	Δ	>	<	<	Chla (mg/m^2)	% cover	<	<	<		<1/2 m	< m	< 3 xm	Δ	Δ
Coastal Manawatu Mana_13	Coastal Manawatu Mana_13a	7 to 8.5	0.5	24	3	70	2	5	200	30	20	337	337	95	2.5		15	30	30
Lower Whanganui Whai_7	Coastal Whanganui Whai_7b	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95		20		30	30
Coastal Whangaehu Whau_4	Coastal Whangaehu Whau_4	7 to 8.5	0.5	22	3	70	2	5	200	30	20	337	337	95		20		30	30
Turakina Tura_1	Ratana Tura_1c	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95			15	30	30
Northern Coastal West_1	Northern Coastal West_1	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95			15	30	30
Kaitoke Lakes West_4	Kaitoke Lakes West_4	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95			15	30	30
Southern Wanganui Lakes West_5	Southern Wanganui Lakes West_5	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95			15	30	30
Northern Manawatu Lakes West_6	Northern Manawatu Lakes West_6	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95			15	30	30
Waitarere West_7	Waitarere West_7	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95			15	30	30
Lake Papaitonga West_8	Lake Papaitonga West_8	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95			15	30	30
Lake Horowhenua Hoki_1	Lake Horowhenua Hoki_1a	7 to 8.5	0.5	24	3	60	2	5	200	30	20	337	337	95			15	30	30

Note these water management subzones also contain streams and river that do not flow into a natural lake. For these waters, standards in Table D.17 apply

Table D:4a *Lake^ Water^* Quality (standards apply year-round to the *waters^* of natural *lakes^* as defined in Table E.1 and not excluded by way of Table E.2(b) clauses iv to ix):

Lake Type	pH	Temp (°C)	Algal Biomass Chl *a* (mg/m^3)		TP (g/m^3)	TN g/m^3	Ammoniacal Nitrogen (g/m^3)	Toxicity	Clarity (m)[7]		Euphotic Depth	*E.coli / 100 ml*	
	Range	≤	≤	Max.	≤	≤	<[8]	%	≥	%Δ	%Δ	Summer (1 Nov – 30 Apr)	Winter (1 May – 31 Oct)
Deep lakes[9]	6.5 – 8.5	24	5	15	0.020	0.337	0.400	95	2.8	20	10	260	550
Shallow lakes[10]	6.5 – 8.5	24	12	30	0.043	0.735	0.400	95	0.8	20	10	260	550

~~Water quality standards for the marine coastal waters. The following standards apply year round to the waters within the coastal Marine area.~~

1. ~~The pH of the water shall be within the range 8 to 8.3 and shall not be changed by more than 0.1 pH;~~
2. ~~The temperature of the water shall not be changed by more than 1°C;~~
3. ~~The Dissolved Oxygen concentration shall not be less than 90 % in the surface waters defined as less than 2 metres deep;~~
4. ~~The average annual algal biomass shall not exceed 1 mg Chlorophyll a/m^3;~~
5. ~~The average annual total phosphorus concentration shall not exceed 10 mg/m^3;~~
6. ~~The average annual total nitrogen concentration shall not exceed 60 mg/m^3;~~
7. ~~The concentration of ammonia nitrogen shall not exceed 60 mg/m^3;~~
8. ~~For toxicants not otherwise defined in these standards, the concentration of toxicants in the water shall not exceed the trigger values defined in the 2000 ANZECC guidelines Table 3.4.1 with the level of protection of 99 % of species;~~
9. ~~The clarity of the water measured as Secchi depth shall not be changed by more than 20%;~~
10. ~~The turbidity shall not be changed by more than 20%. This standard shall apply only when physical conditions existing at the site prevent adequate water clarity (Secchi Disc) measurement.~~
11. ~~The concentration of *Enterococci* shall not exceed 140 per 100 millilitres. This standard applies during the period 1st November to 30th April inclusive, and~~
12. ~~The concentration of *Enterococci* shall not exceed 280 per 100 millilitres. This standard applies during the period 1st May to 31th October inclusive.~~
13. ~~The median concentration of faecal coliforms shall not exceed 14 per 100 millilitres and the 90th percentile shall not exceed 43 per 100 millilitres. This standard applies year round.~~
14. ~~The concentration of toxins due to cyanobacteria (blue-green algae) shall not exceed 20 milligrams per cubic metre. This standard applies year round.~~

7 The horizontal black disc sighting method is not directly equivalent to Secchi depth measurement; horizontal black disc is approximately 25% lower in magnitude than Secchi depth and results should be adjusted accordingly

8 Standard only applies when lake pH exceeds 8.5 within the epilimnion (shallow lakes) or within 2m of the water surface (deep lakes)

9 A deep lake is defined as a lake that undergoes stable thermal stratification in summer.

10 A shallow lake is defined as a lake that does not undergo stable thermal stratification in summer

Schedule D Standards Key

Water^ Quality Standards Key: definition of abbreviations and full wording of the standards (placement of the numerical values for a specified standard are indicated by [...]).

~~**Table D.16:** The Water quality standards defined in Table 2 shall be read as follows (The numerical values in are indicated by [...])~~

~~Column~~ Abbreviations used in Tables D:1 to D:4		~~Standard spelt out~~ Full Wording of the Standard
Header	Sub-header	
pH	Range	The pH of the *water*^ shall be within the range [...] to [...]~~.~~ unless natural levels are already outside this range.
	Δ	The pH of the *water*^ shall not be changed by more than [...].
Temp (°C)	<	The temperature of the *water*^ shall not exceed [...] degrees Celsius.
	Δ	The temperature of the *water*^ shall not be changed by more than [...]degrees Celsius.
DO (% SAT)	~~<~~ >	The concentration of dissolved oxygen (DO) shall exceed [...] % of saturation.
sCBOD$_5$ (g/m^3)	<	The monthly average five-days filtered / soluble carbonaceous bio~~logical~~chemical oxygen demand (BOD) when the *river*^ flow is at or below 20th percentile of flow shall not exceed [...] grams per cubic metre.
POM (g/m^3)	<	The average concentration of particulate organic matter when the *river*^ flow is at or below 50th percentile of flow shall not exceed [...] grams per cubic metre.[11]
Periphyton (*rivers*^)	~~Chla~~ Chl *a* (mg/m^2)	The algal biomass on the stream or *river*^ *bed*^ shall not exceed [...] milligrams of chlorophyll *a* per square metre.
	% cover	The maximum cover of visible stream or *river*^ *bed*^ by periphyton ~~(~~as filamentous algae more than 2 centimetres long~~)~~ shall not exceed [...] %.
		The maximum cover of visible stream or river bed by periphyton as diatoms or cyanobacteria more than 0.3 centimetres thick shall not exceed [...] %.
Algal biomass Chl *a* (mg/m^3) (*lakes*^)	≤	The annual average algal biomass shall not exceed [...] milligrams chlorophyll *a* per cubic metre.
	Maximum	no sample shall exceed [...] milligrams chlorophyll *a* per cubic metre.
DRP (~~m~~g/m^3)	<	The annual average concentration of dissolved reactive phosphorus (DRP) when the *river*^ flow is at or below ~~three times the median~~ the 20th percentile of flow shall not exceed [...] ~~milli~~grams per cubic metre, unless natural levels already exceed this standard.
TP (g/m^3) (*lakes*^)	≤	The annual average concentration of total phosphorus (TP) shall not exceed [...] ~~milli~~grams per cubic metre.
SIN (~~m~~g/m^3)	<	The annual average concentration of soluble inorganic nitrogen[12] (SIN) when the *river*^ flow is at or ~~below three times the median~~ 20th percentile of flow shall not exceed [...] ~~milli~~grams per cubic metre, unless natural levels already exceed this standard.
TN (g/m^3) (*lakes*^)	≤	The annual average concentration of total nitrogen shall not exceed [...] ~~milli~~grams per cubic metre.
~~Q~~MCI[13]		The ~~quantitative~~ Macroinvertebrate CommunityIndex (MCI) shall exceed [...], unless natural physical conditions are beyond the scope of application of the ~~Q~~MCI. In cases where the *river*^ or stream habitat is suitable for the application of the soft-bottomed variant of the MCI (sb-MCI) the standards shall also apply.
QMCI	~~%~~ Δ	No ~~more than a 20 %~~statistically significant reduction in Quantitative Macroinvertebrate CommunityIndex (QMCI) score between appropriately matched habitats upstream and downstream of discharges to *water*^.
Ammoniacal nitrogen[14] (~~m~~g/m^3) (*rivers*^)	<	The average concentration of ammoniacal nitrogen shall not exceed [...] ~~milli~~grams per cubic metre.
	Max	The maximum concentration of ammoniacal nitrogen shall not exceed [...] grams per cubic metre
Ammoniacal nitrogen (g/m^3) (*lakes*^)	≤	The concentration of ammoniacal nitrogen shall not exceed [...] grams per cubic metre when *lake*^ pH exceeds 8.5 within the epilimnion (shallow *lakes*^) or within 2 m of the *water*^ surface (deep *lakes*^).
Toxicants	≤ %	For toxicants not otherwise defined in these standards, the concentration of toxicants in the *water*^ shall not exceed the trigger values defined in the 2000 ANZECC guidelines Table 3.4.1 for the level of protection of [...] % of species. For metals the trigger value shall be adjusted for hardness and apply to the dissolved fraction as directed in the table.
~~Turbidity (NTU) (Rivers)~~	~~< ½ m~~	~~The turbidity of the water when the river flow is at or below half median flow shall not exceed [...] Nephlometric Turbidity Units (NTU)~~
	~~<m~~	~~The turbidity of the water when the river flow is at or below median flow shall not exceed [...] Nephlometric Turbidity Units (NTU)~~
	~~<3 x m~~	~~The turbidity of the water when the river flow is at or below three times median flow shall not exceed [...] Nephlometric Turbidity Units (NTU)~~
	~~%Δ~~	~~The turbidity of the water shall not be changed by more than [...] %. This standard shall apply only when physical conditions existing at the site prevent adequate water clarity (back Disc) measurement.~~
Clarity (m) (*rivers*^)	% Δ	The clarity of the *water*^ measured as ~~being~~ the horizontal sighting range of a ~~200 mm~~ black disc shall not be ~~changed~~ reduced by more than [...] %.
	≥	The clarity of the *water*^ measured as ~~being~~ the horizontal sighting range of a ~~200 mm~~ black disc shall equal or exceed [...] metres when the *river*^ is at or below the 50th percentile of flow.
Clarity (m) (*lakes*^)	% Δ	The clarity of the *water*^ measured as Secchi depth (or horizontal sighting range of a 200 mm black disc[15]) shall not be reduced by more than [...] %.
	≥	The clarity of the *water*^ measured Secchi depth (or horizontal sighting range of a 200 mm black disc[15]) shall exceed [...] metres
E.coli / 100 ml (rivers^)	< m	The concentration of *Escherichia coli* shall not exceed [...] per 100 millilitres from 1 November – 30 April (inclusive) when the *river*^ flow is at or below the 50th percentile of flow.
	<20th %ile	The concentration of *Escherichia coli* shall not exceed [...] per 100 millilitres when the *river*^ flow is at or below the 20th percentile of flow year round.
E.coli / 100 ml (*lakes*^)	Summer	The concentration of *Escherichia coli* shall not exceed [...] per 100 millilitres from 1 November – 30 April (inclusive).
	Winter	The concentration of *Escherichia coli* shall not exceed [...] per 100 millilitres from 1 May – 31 October (inclusive).
Euphotic Depth (lakes^)	% Δ	Euphotic depth shall not be reduced by more than [...] %.

~~Notes:~~

~~d. Soluble Inorganic Nitrogen (SIN) concentration is measured of the sum of nitrate nitrogen, nitrite nitrogen and Ammoniacal nitrogen or a sum of Total oxidised nitrogen and Ammoniacal nitrogen~~

[11] Standard can also be applied to volatile suspended solids (VSS)

[12] Soluble inorganic nitrogen (SIN) concentration is measured as the sum of nitrate nitrogen, nitrite nitrogen and ammoniacal nitrogen or the sum of total oxidised nitrogen and ammoniacal nitrogen.

[13] The Macroinvertebrate Community Index (MCI) standard applies only for State of the Environment monitoring purposes to determine if the aquatic macroinvertebrate communities are adequate to provide for and maintain the values in each WMSZ, this standard is not appropriate for monitoring the effect of activities such as discharges to water on macroinvertebrate communities upstream and downstream of the activity.

[14] Ammoniacal-N is a component of SIN. SIN standards should also be considered when assessing ammoniacal-N concentrations against the standards

[15] The horizontal black disc sighting method is not directly equivalent to Secchi depth measurement, horizontal black disc is approximately 25% lower in magnitude than Secchi depth and results should be adjusted accordingly.