

Proposed Plan Change 7 to the Canterbury Land and Water Regional Plan

Second set of Responses to Questions of Hearing Commissioners from the First Hearing Day (29 September 2020).

13 October 2020

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| Question | Response |
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| <p>Drinking water standards:</p> <p>In relation to the CCC submission:</p> <ul style="list-style-type: none"> • What is the Drinking Water Standard; • what is the authority for it; • what is the text of it; • how was the standard reached; • is it based on a median, or mean, or something like that in terms of effects on the health of the population; and • would a precautionary approach be permissible in respect of that issue? | <p>Angela Fenemor (Planning)/Carl Hanson (Technical)/Philip Maw & Imogen Edwards (Legal):</p> <p>The drinking water standards for New Zealand are set out in “Drinking-Water Standards for New Zealand 2005 (Revised 2018)” (hereafter referred to as the “Drinking-Water Standards). A copy of the Drinking-Water Standards is attached as Appendix 1.</p> <p>Under the Health Act 1956², drinking-water suppliers must ensure that the drinking water supplied complies with the Drinking-Water Standards. The Canterbury District Health Board works on behalf of the Ministry of Health to administer the requirements of the Health Act 1956, and assess water suppliers compliance with the Drinking-Water Standards (amongst other things).</p> <p>The Drinking-Water Standards set a Maximum Acceptable Level (MAV) of 50mg/L for nitrate³, which is equivalent to 11.3mg/l nitrate-nitrogen. The Drinking-Water Standards state that <i>“short-term exposure MAVs for nitrate and nitrite have been established to protect against methaemoglobinaemia in bottle-fed infants”</i>⁴.</p> <p>By “short-term exposure”, the drinking-water standards are saying that any consumption by bottle-fed infants of water with a nitrate concentration greater than the MAV creates an unacceptable risk of methaemoglobinaemia. This is in contrast to the MAV for most other chemical contaminants, where the risk is based on a lifetime of consumption.</p> <p>The MAV for nitrate is based on the World Health Organisation (WHO) guideline value, the background for which is described in: <i>Nitrate and Nitrite in Drinking-water. Background document for development of</i></p> |

¹ Carl Hanson holds the position of Groundwater Science Manager, Environment Canterbury. Mr Hanson has expertise in groundwater quality.

² Section 69V(1)

³ Table 2.2 of the Drinking-Water Standards “Maximum acceptable values for inorganic determinands of health significance”

⁴ Note (3) below Table 2.2 of the Drinking-Water Standards

WHO Guidelines for Drinking-water Quality. World Health Organization 2011. Based on this document, the risk is primarily to bottle-fed infants up to 3 months old.

Determining compliance with the Drinking-Water Standards is described in section 3.1.1 of the standards document. It states, on page 14, that:

“The allowable number of MAV exceedances (Table A1.4) is calculated on the basis that there is 95 percent confidence that the MAV is exceeded for no more than 5 percent of the time. To meet this, a supply needs to be monitored at least 38 times during the compliance monitoring period. In the interests of affordability, a lesser level of confidence has been accepted for communities of up to 500 people (section 10).”

For nitrate in drinking water, a water supply will not comply with the Drinking-Water Standards if nitrate is detected in any sample at a concentration above the MAV (11.3 mg/L as nitrate-nitrogen). Table A1.4 of the Drinking-Water Standards does allow for exceedances in some samples, but this is unlikely to apply to many water supplies. Specifically, if a source is tested more than 76 times in a year (the compliance period for nitrate), a single sample with a concentration above the MAV would be allowable, and more exceedances would be allowable with further increased sampling. However, the Drinking-Water Standards also say *“In most cases, the number of samples tested during a year will be less than 76, in which case each transgression will result in non-compliance.”*

The meaning of the precautionary principle was set out in *Friends of Nelson Haven & Tasman Bay Incorporated v Marlborough District Council* [2016] NZEnvC 151:

“[22] The precautionary principle, as developed in New Zealand case law, has a different emphasis. It comes into play where there is uncertainty about the likelihood, or possibility, of adverse effects arising from a given activity, and/or the significance of those adverse effects. Where that is so, the principle holds that commensurate caution should be applied to any necessary decision-making.”

The orthodox expression of the precautionary approach is that where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation [Rio Declaration on Environment and Development, Principle 15].

While this principle is often cited, it is not explicitly prescribed in the RMA. Rather, its use in RMA decision-making has evolved as a result of the direction to have regard to potential effects on the environment and the wide definition of effect (which includes potential effects of low probability with a high potential impact).

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| | <p>Accordingly, while it may be permissible to adopt a precautionary approach based on the principles discussed above, the question of whether it is appropriate to do so here will depend on the evidence before the Panel.</p> <p>For completeness, we note that PC7 seeks to introduce a more stringent standard for nitrate-nitrogen (in rivers, lakes, individual Waimakariri District Council Community water supply wells, and private water supply wells) than the Drinking-Water Standard equivalent of 11.3mg/L nitrate-nitrogen. Further, we also record that the Ministry of Health is currently carrying out further research in respect of nitrates in drinking water, which is expected to be published by the end of this year.</p> |
| <p>Could the Officers provide an example of an effect that is not minor but is no more than minimal?</p> <p>'Responses to Questions of Hearing Commissioners on Council s42A Report dated 28 May 2020 and additional questions dated 16 June 2020' pg 24.</p> | <p>Philip Maw & Imogen Edwards (Legal)/Matthew McCallum-Clark & Andrea Richardson (Planning):</p> <p>Policy 4.47(b) provides for small scale diversions of water within the beds of lakes, rivers or adjoining wetlands, as part of removing gravel or other earthworks "provided there are no potential adverse effects that are more than minimal on any other person, their property, or any ecological, cultural, recreational or amenity values of the fresh waterbody" (see the Consolidated Officer Recommendations dated 10 July 2020).</p> <p>An example of an effect that is not minor but is no more than minimal in this context could be a short term diversion of water, which results in extra sediment load in the water for a short period of time. This adverse effect on the fresh waterbody may not be considered minor but could be considered more than de minimis.</p> <p>A further example may be the recontouring of the bed, with the associated diversion of water, to enable the protection of infrastructure such as a road or a bridge. There could be a range of short-term effects on, for example, recreational or ecological values in the local area, until the bed restabilises and a more natural form establishes. Again, such an effect may be more than de minimis, but is likely to be toward that end of the effects spectrum.</p> <p>For completeness, we note that the Planning Tribunal in <i>Bethwaite and Church Property Trustees v Christchurch City Council</i> C85/93 noted that, albeit in the context of section 105(2)(b)(i) of the RMA (now section 104D(1)(a)):</p> <p><i>"The word 'minor' is not defined in the Act but dictionary meanings suggest that in its primary sense, which is the appropriate one here, it is a comparative word. Thus, the Concise Oxford Dictionary gives as the primary meaning 'less or comparatively small in size or importance...'. The Collins Concise Dictionary gives as the primary meaning 'lesser or secondary in amount, importance,...'</i></p> <p><i>It seems clear therefore, that in providing the pre-condition in section 105(2)(b)(i) of the Act Parliament did not intend that there should be no</i></p> |

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| | <p><i>adverse effects. Nor, it seems to us, did it intend that any adverse effects should be minimal. That is to say, again having recourse to dictionaries, ‘smaller or very minute or slight’. Thus, in using the word ‘minor’ Parliament intended that whatever adverse effects there might be they had to be less than major, but could be more than simply minute or slight.”</i></p> |
| <p>Pg 53. Could the Officers provide an example of wording for a policy which amalgamates Policies 14.4.35, 14.4.36 and 14.4.37?</p> | <p>Matthew McCallum-Clark (Planning):</p> <p>Policies 14.4.35, 36 and 37 set out the regime for operation of the Opuha dam system and flows within the Opuha and Opihi Rivers and their tributaries. It was acknowledged in answers to earlier written questions that greater clarity could be provided by amalgamating and further adjusting these policies. Recommended wording for such a combined policy is:</p> <p><u>14.4.35 Connectivity is maintained, and ecological health and flow variability in the augmented Opuha and Opihi mainstems is improved by ensuring that:</u></p> <ul style="list-style-type: none"> <u>(a) water is released from the Opuha Dam to maintain the health of the downstream waterbodies; and</u> <u>(b) water released from the Opuha Dam is sufficient to ensure compliance with the environmental flow regime requirements for Skiptons Bridge and Saleyards Bridge plus the amount of water abstraction occurring under AA and BA permits downstream of Saleyards Bridge; and</u> <u>(c) when the level of Lake Opuha falls below RL370, water released from the Opuha Dam for augmentation of the Opuha and Opihi mainstems equals inflows into the Lake; and</u> <u>(d) in the period 1 November to 31 March of the following year, flushing flows are released that are effective at reducing the duration and severity of nuisance periphyton blooms, refreshing the river and lagoon and assisting with providing effective fish passage; and</u> <u>(e) a two-tiered minimum flow regime is established for the Opihi River at Saleyards Bridge, with the lower-tier minimum flow only available when:</u> <ul style="list-style-type: none"> <u>(1) any two of:</u> <ul style="list-style-type: none"> <u>(i) the level of water in Lake Opuha;</u> <u>(ii) snow pack in the Lake Opuha Catchment; and</u> <u>(iii) inflows into Lake Opuha</u> <u>are below levels specified in Table 14(x); and</u> <u>(2) the volume of water abstracted downstream of Opuha Dam has reduced by at least 50% below the sum of the AA and BA permits; and</u> <u>(f) AA, BA, Kakahu, AN and BN allocations recognise the different rights attributed to shareholdings in the Opuha Dam operator, which may enable augmentation of flows to off-set abstraction and improve water availability.</u> |

Could the Officers provide an example of an improvement in the drafting of clauses (a) and (b) of Policy 14.4.16 and the subsequent rules?

Matthew McCallum-Clark (planning):

Policy 14.4.16 contains two clauses; (a) and (b), which are implemented by Rules 14.5.25 and 14.5.25A respectively. These provisions address additional stock exclusion requirements that apply within the OTOP sub-region. The Officers acknowledge there is an opportunity to improve the drafting of Policy 14.4.16 to aid clarity and improve implementation.

Two options for amending Policy 14.4.16 are provided below for consideration. Amendments in **red** reflect the existing recommendations set out in the Consolidated Officer Recommendations (10 July 2020) document, while amendments in **blue** reflect new suggested changes.

Option 1 below (the Officers' preferred approach) simply deletes clause (b), as its content has been included in clause (a) in the previous recommendations.

Option 1:

Protect papatipu rūnanga values associated with springs (waipuna), freshwater mātaimai, rivers and lakes and reduce the loss of microbial contaminants, phosphorus and sediment to surface water by:

a.—extending, including to other categories of stock in the Mātaitai Protection Zone, implementing, within the Orari-Temuka-Opihi-Pareora sub-region, the region-wide provisions for stock exclusion to permanently or intermittently flowing springs (waipuna); and open drains and other artificial watercourses with surface water in them that discharge into a lake, river or wetland.; ~~and~~

~~b.—excluding, within the Mātaitai Protection Zone, all farmed cattle, deer and pigs from the bed (including the banks) of lakes and rivers, any permanently or intermittently flowing spring, and any open drain or artificial watercourse that contains water and that discharges into a lake, river or wetland.~~

Option 2 below (not the Officers' preferred approach) provides an alternative should the Hearing Commissioners consider it appropriate to retain the matters in clauses (a) and (b) as separate clauses. Minor additions for clarity are still recommended under this option. This format is also consistent with the structure of the equivalent policy in Section 8 of the CLWRP; Policy 8.4.31.

Option 2:

Protect papatipu rūnanga values associated with springs (waipuna), freshwater mātaimai, rivers and lakes and reduce the loss of

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| | <p><u>microbial contaminants, phosphorus and sediment to surface water by:</u></p> <ul style="list-style-type: none"> a. <u>extending, including to other categories of stock in the Mātaitai Protection Zone, implementing, within the Orari-Temuka-Opihi-Pareora sub-region, the region-wide provisions for stock exclusion to also apply to permanently or intermittently flowing springs (waipuna); and open drains and other artificial watercourses with surface water in them that discharge into a lake, river or wetland; and</u> b. <u>excluding, within the Mātaitai Protection Zone, excluding all farmed cattle, deer and pigs from the bed (including the banks) of lakes and rivers, any permanently or intermittently flowing spring, and any open drain or artificial watercourse that contains water and that discharges into a lake, river or wetland.</u> <p>On reflection, no further amendments are recommended here for Rules 14.5.25 and 14.5.25A.</p> |
| <p>In relation to a new bespoke rule limited to replacement of surface water abstractions affected by new High Naturalness classifications, can the Officers' provide some wording for what such a rule might look like?</p> | <p>Matthew McCallum-Clark (planning)</p> <p>In earlier responses to questions from the Hearing Panel, the Officers acknowledged the significant difficulty that existing abstractors affected by the new classification of Milford Lagoon and Orakipaoa Creek as High Naturalness Water Bodies would face to renew their water permits.</p> <p>This was particularly due to the non-complying status of these applications under Rule 14.5.5, region-wide Policy 4.6 being a significant hurdle to the granting of these permits, as well as the Officers' recommendation to remove the T Allocation Block.</p> <p>The Officers suggested that, if the Hearing Panel were minded to delete the T Allocation Block, a bespoke rule limited to replacement of surface water abstractions affected by new High Naturalness classifications could be provided as potential solution. This rule is now provided as follows:</p> <p>Rule 14.5.6A</p> <p>Despite Rules 14.5.4 to 14.5.6, the taking and use of surface water that will replace a lawfully established take affected by the provisions of Sections 124-124C of the RMA from the Milford Lagoon and Orakipaoa Creek High Naturalness Water Bodies in Section 14.8 is a restricted discretionary activity, provided the following conditions are met:</p> <p>1. The take, in addition to all existing consented takes, does not result in an exceedance of any minimum flow limit set in Tables 14(h) to 14(za); and</p> |

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| | <p>2. The take, in addition to all existing takes, will not result in an exceedance of any allocation limit, or rate of take, or seasonal or annual volume limit set in Tables 14(h) to 14(za); and</p> <p>3. The resource consent that is being replaced has been given effect to and has not lapsed.</p> <p>[insert same matters of discretion as Rule 14.5.4]</p> <p>The Officers also acknowledged that following the Section 42A report, and previous responses to the Hearing Panel in relation to the T allocation block, a Memorandum from Mr Clark was filed, addressing the differences in groundwater allocation accounting that exist between the OTO Resource Consent Inventory (RCI) and the ECan Water Data Programme (the new method) which has recently been approved for use by Council.</p> <p>To briefly summarise, the new method will result in groundwater allocation being available in both the Levels Plains and Orari-Opihi Groundwater Allocation Zones (GAZ), which were both previously deemed as over-allocated in the OTO RCI. Differences in current allocation between the two methods are set out in Table 1 of the Memorandum.</p> <p>Three possible solutions are set out in the Memorandum to resolve issues arising from new allocation becoming available in these GAZs. However, the Officers note that in reality, any potential “T” allocation block in the Levels Plains and Orari-Opihi GAZs will be limited to a small volume and will only benefit a small number of abstractors.</p> <p>Should the Hearing Panel consider it appropriate to allow this newly available groundwater to be abstracted from these GAZs, the Officers suggest that an additional option could be to include policy direction stating that this water is only available to those abstractors who are unable to renew their water permits, or will face significant difficulty accessing water due to shifting flow regimes. This would prioritise applications from the areas such as Milford Lagoon and Orakipaoa Creek High Naturalness Water Bodies. Wording for such a framework could be provided during the Reply report.</p> <p>The Officers further note that some parties have stated in their evidence that T allocation block water, even if included in the Plan, would not be of benefit to them or is impractical.</p> |
| Pg 71. Rule amendments | <p>Angela Fenemor (Planning):</p> <p>In earlier responses to questions from the Hearing Panel, the Officers provided an explanation why explicit reference to Table 8-9 is not included in Rule 8.5.27, despite the N loss reductions set out in Table 8-9 applying to farming enterprises. It is the Officers view that a new condition is not required as the consent application must include an FEP prepared in accordance with Schedule 7, and in the case of the</p> |

Waimakariri subregion, a new target has been included that relates to the percentage reductions in Table 8-9. This approach is consistent with the rules for other sub-region sections that require N loss reductions.

The following amendments are in response to the request from the Panel to provide suggested wording for their consideration.

For completeness, Officers have included amendments to the drop out rules, so it is clear which rule applies should a consent application not meet the new condition. Given that the new condition duplicates matters covered under Condition 1, the applicable drop out rule should be the same (i.e. Non-complying activity under Rule 8.5.28).

Suggested amendments to these rules are set out below, shown in underlined in [blue](#) text:

8.5.26 The use of land for a farming activity on a property greater than 5 hectares in area that does not comply with one or more of conditions 1, 2 or 3 of Rule 8.5.24 or one or more of conditions 2, 3 or 4 of Rule 8.5.25 is a restricted discretionary activity, provided the following conditions are met:

1. A Farm Environment Plan has been prepared for the property in accordance with Part A of Schedule 7 and is submitted with the application for resource consent; and
[2A. The Farm Environment Plan submitted with the application for resource consent identifies how reductions required by Table 8-9 will be achieved for any land within the Nitrate Priority Area; and](#)
2. Until 30 June 2020, the nitrogen loss calculation for the property does not exceed the nitrogen baseline, and from 1 July 2020 the Baseline GMP Loss Rate unless the nitrogen baseline was lawfully exceeded prior to 20 July 2019, and the application for resource consent demonstrates that the exceedance was lawful.

The exercise of discretion is restricted to the following matters:

...

8.5.27 The use of land for a farming activity as part of a farming enterprise is a discretionary activity, provided the following conditions are met:

1. A Farm Environment Plan has been prepared for the farming enterprise in accordance with Part A of Schedule 7 and is submitted with the application for resource consent; and
[2A. The Farm Environment Plan submitted with the application for resource consent identifies how reductions required by Table 8-9 will be achieved for any land within the Nitrate Priority Area; and](#)
2. Until 30 June 2020, the nitrogen loss calculation for the farming enterprise does not exceed the nitrogen baseline, and from 1 July 2020 the Baseline GMP Loss Rate; and
3. The properties comprising the farming enterprise are in the same Surface Water Allocation Zone as shown on Planning Maps.

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| | <p><u>8.5.28 The use of land for a farming activity on a property greater than 5 hectares that does not comply with condition 1 of Rule 8.5.25, or condition 1 or 2A of Rule 8.5.26, or the use of land for a farming activity as part of a farming enterprise that does not comply with conditions 1, 2A or 3 of Rule 8.5.27, is a non-complying activity.</u></p> |
| <p>JWS -Should dissolved oxygen be changed to dissolved oxygen concentration, and what would that look like?</p> | <p>Shirley Hayward (Ecology):</p> <p>The NPSFM 2020 has introduced new attributes for dissolved oxygen for lakes (Appendix 2B Tables 18 and 19) and uses concentration as a measure of dissolved oxygen availability. There is considerable discussion in the supporting documents to the NPSFM 2020 (and draft NPSFM 2019) on the appropriateness of concentration as a more protective measure of oxygen availability to aquatic life compared to percentage saturation that is a measure currently used in the LWRP and RMA. While we have not had time to assess the implications of the NPSFM 2020 dissolved oxygen attributes for lakes region-wide, it is sensible to include these attributes in PC7 for lakes such as Lake Opuha as proposed in Mr Measures’ evidence for Opuha Water Limited.</p> <p>In recommending attribute states for dissolved oxygen in Lake Opuha, we recommend that dissolved oxygen outcomes sit within Band B. This is consistent with states proposed for other ecosystem health attributes such as phytoplankton (chlorophyll a), and total nitrogen and phosphorus. Because of historical issues with deoxygenated hypolimnetic water causing release of nutrients and metals (e.g., iron and manganese) from the lake bed, we recommend the lake bottom dissolved oxygen attribute is set in the middle of the Band B range at 5 mg/L, which is the general threshold at which geochemical release of minerals (e.g., manganese) begins (Gibbs and Hickey, 2012⁵). Similarly, we recommend the mid-hypolimnetic dissolved oxygen is set at 6 mg/L which is around the mid- range of state B, and will likely avoid short term stress to the aquatic fauna that occur within the lake.</p> <p>Waitarakao/Washdyke Lagoon is also listed in Table 14(b) and therefore, it is appropriate to set consistent measures of dissolved oxygen attribute outcomes for this lagoon. Waitarakao/Washdyke Lagoon is a coastal lagoon that is part of the Waitarakao Mātaitai Reserve and has important cultural and ecological values. We therefore recommend that the dissolved oxygen attribute states for Waitarakao/Washdyke lagoon are set at Attribute State B, which is consistent with the phytoplankton (chlorophyll a) attribute state in Table 14(b). Because</p> |

⁵ Gibbs, M. Hickey, C. 2012: Guidelines for artificial lakes. Before construction, maintenance of new lakes and rehabilitation of degraded lakes. NIWA client report HAM2011-045 prepared for Ministry of Building, Innovation and Employment.

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| | <p>Waitarakao/Washdyke Lagoon is a shallow coastal lagoon, it is very unlikely to stratify, and therefore we recommend that only a lake bottom dissolved oxygen attribute is set. Ensuring this attribute is set at a level that prevents both anoxic conditions in the lake bed sediments to arise and avoids stress on aquatic fauna is important. We therefore recommend the lake bottom dissolved oxygen attribute for Waitarakao/Washdyke Lagoon is set at 6 mg/L.</p> |
| <p>JWS at [19] any resolution of the disagreement there?</p> | <p>Shirley Hayward (Ecology):</p> <p>Mr Measures raised the issue of defining the period of data to be used to assess compliance with the water quality outcomes proposed in Table 14(b). This issue is particularly relevant where high frequency data is collected (e.g., using continuous sensor measurements, rather than spot sampling or profile sampling). Continuous sensors can have fluctuations in their measurements that is to do with instrument functioning, despite regular calibration and maintenance regimes. Therefore, it is reasonable to use a time averaged set of data to determine compliance with the attribute outcomes. However, because the dissolved oxygen attributes are intended to avoid short term effects on aquatic ecosystem health, we recommend only a short time period is used to 'average' readings. We therefore recommend that for assessing compliance with the proposed dissolved oxygen lake attributes, where continuous measurement data are used (e.g. 15 minute intervals or less), that a 1-hour averaged measured is used to assess against the dissolved oxygen attribute outcomes in Table 14(b).</p> |
| <p>JWS - Amended Table 14(b) provisions.</p> | <p>Shirley Hayward (Ecology):</p> <p>Response shown on the following page - amendments in red reflect the existing recommendations set out in the Consolidated Officer Recommendations (10 July 2020) document, while amendments in blue reflect new suggested changes.</p> |

Table 14(b): Freshwater Outcomes for Orari-Temuka-Opihi-Pareora Lakes to be achieved by 2030

| Freshwater Management Unit | Lake type | Lake | Ecological Health Attribute | | | | Eutrophication Attribute | | | Visual Quality Attribute | Human Health for Recreation | | | | Cultural Attribute | |
|----------------------------|---|------------------------------|---|---|------------------------|-----------------------------------|---|---|-----------------------|--|-----------------------------|----------------------------------|----------------------------|---|--|-------------------|
| | | | Dissolved oxygen (min saturation minimum concentration) | | Temperature (max) (oC) | Lake SPI ¹ (min grade) | TLI ² Maximum annual average | Chlorophyll a | | | Colour | Cyanobacteria (mm/L) [max value] | Escherichia coli (E. coli) | | | SFRG ³ |
| | | | Minimum Hypolimni on (%) Lake bottom (mg/L) | Minimum Epilimni on (%) Mid-hypolimni on (mg/L) | | | | Maximum annual average (mg chl-a/m ³) (mg/L) ³⁵⁰ | Annual maximum (mg/L) | | | | Median (E.coli/100m l) | 95 th percentile (E.coli/100m l) | | |
| Opihi | Natural* Artificial lakes – on river | Lake Opuha | 70 <u>5</u> | 90 <u>6</u> | 19 | High | 4.0 | 4.0 | 25 | | 0.5 | 130 | 540 | Good | Freshwater mahinga kai species sufficient & abundant for customary gathering, water quality is suitable for their safe harvesting, and they are safe to eat. | |
| Timaru | Coastal lake | Waitarakao / Washdyke Lagoon | 70 <u>6</u> | 90 n/a | 19 | Moderate | n/a | 5 | 25 | Natural colour not degraded more than five Munsell Units | 10 | 260 | 1200 | No value set | | |

¹ Lake SPI = Lake Submerged Plant Indicators from Clayton J, Edwards T (2002) LakeSPI: a method for monitoring ecological condition in New Zealand lakes (Technical report Version 1 by NIWA)

² TLI = Trophic Level Index from: Protocol for Monitoring Trophic Levels of New Zealand Lakes and Reservoirs (Report by Lakes Consulting, March 2000).

³ SFRG = Suitability for Recreation Grade from Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas, Ministry for the Environment 2003

[4 Where continuous measurements of dissolved oxygen are recorded \(15 minute intervals or less\), the 1-hour average shall be used to assess compliance against the dissolved oxygen outcomes.](#)

* Correction of an error in the notified version of PC7