

Final Wrap up

Thank you for the opportunity to appear before you. I have listened to the submissions of some further parties since completing my summary. Many of the concerns and issues about PC7 that I expressed in my submission, evidence, rebuttal evidence and summary have been traversed by others at the Hearing so I have little to add to what I and others have tabled. I'd just like to emphasise some key points by way of summary.

They are:

- All Christchurch aquifers will be negatively affected by what PC7 proposes (para 13 summary)
- Aquifer nitrate concentrations could go higher still once the groundwater model is expanded to include all contributions from farming in the Waimakariri catchment that will impact on the Christchurch aquifers (para 15 summary)
- In my view the Environment Canterbury groundwater model is the result of a plausible, elegant and comprehensive study and its outputs provide data to inform PC7 notwithstanding all the uncertainties involved (para 40 summary)
- The modelling outputs are in keeping with what has occurred and been observed in New Zealand and elsewhere in the world where unconstrained intensive dairy farming on pasture has been practiced and problems with polluted surface and groundwater have arisen (para 7 summary)
- Larger reductions in nitrate leachate permissible from the interzone transfer source area in the WZ under PC7 may be needed to meet the proposed CCC upper limit of 1.0 mg NO₃⁻-N/L in the Christchurch deep aquifers (para 43)
- The proposed CCC limit if adopted under PC7, with appropriate requirements/rules to reduce nitrate leaching in the interzone transfer source area, will still mean degradation of Christchurch's groundwater will occur (the median level will rise from 0.3 to 0.55 mg NO₃⁻-N/L); is this acceptable under the NPS2020? (para 20)
- The option of retaining Christchurch's groundwater quality as it is, which is what I want, and setting a requirement that farming in the interzone transfer source area must meet a limit of about 2kg nitrate nitrogen /Ha/yr (paras 66-67) does not preclude dairy farming in the zone so long as it meets such requirements.

One final comment. Dr Metherell suggested in evidence to the Hearing on Monday 16 November that supplementary data in the Danish nitrate study I and others had referred to was inconsistent with its conclusions. My view is that if this was the case the paper would never have passed peer review and been published. In addition, the views of Professor Frizelle and Dr Deborah Woodley expressed in an article by Fiona Cassie published in RataAoteraroa/New Zealand Doctor concerning nitrates and bowel cancer and the Danish study, and also referred to by Dr Metherell, are not shared by all experts in the field. Correspondent Cassie discusses in the article that the Danish study rang alarm bells for Professor of Public Health, Michael Baker, at the University of Otago, Wellington, and similarly for Dr Alistair Humphrey.

I am happy to answer any questions you might have.

Dr Douglas A Rankin, 19 November 2020