Before the Hearing Panel appointed by Canterbury Regional Council

IN THE MATTER OF The Resource Management Act 1991

AND

IN THE MATTER OF resource consent applications by various parties to: take, divert, dam and use water from rivers, streams, and ground water; to discharge water into water; and for works in the bed and banks of rivers and lakes in the Upper Waitaki catchment

Clarification and responses to questions from the presentation of the individual Section 42A Reports

Date: 12th February 2010

1. Below follows a response to questions raised by the Commissioners during the course of the presentation of the s42A reports. Each topic has been prepared by an individual who will be able to speak to this response if required.

Minimum flows – Table 3, row xxii

Application of this rule provision

2. This rule is applied to all applications to take and use water from a water body that is not otherwise specified in Table 3. To be considered a discretionary activity, it is applied by requiring a minimum flow of the 5yr 7-day low flow to be complied with, and if the take will exceed the mean flow, then flow sharing must also be complied with.

3. If an applicant proposes a minimum flow lower than the 5yr 7-day low flow, or not to comply with flow sharing above the mean flow, then it would be considered a non-complying activity.

4. As there is no allocation limit specified in row xxii, this does not affect the status of the activity.

Assessment by the Chief Executive of CRC

5. The issue of the CRC needing to assess by resolution the values for all water bodies in row xxii of Table 3 was first raised in a minute of Commissioner Skelton at the Lower Waitaki hearing. At that time, Ms Gillian Ensor (CRC Consents Project Leader) presented a paper to the Council's Regional Planning Committee (RPC) discussing this requirement. She noted in this presentation that the flows have been determined with the best available information at the time, but that they were likely to change over time as more information becomes available. The Council, aware of this, passed a resolution via the RPC to give delegated authority to the Chief Executive of CRC to enable him to provide the data required to comply with the minimum flow standards prescribed in Table 3 of the Waitaki Plan. (see attached copy of the RPC Agenda for the meeting of 10 June 2009, and page 180 of the full Council agenda which confirms the delegation).

6. Under this authority, the Chief Executive is not limited in the number of assessments he can make. As more information becomes available he may re-assess the minimum and mean flows on some water bodies. No direction is provided in the delegation to suggest there is a limited number of times this assessment can be made.

7. In making his initial assessment, the Chief Executive was provided with the s42A report of Mr Dave Stewart which details how each 5yr 7-day low flow and mean flow has been arrived at. This information was reviewed by another hydrologist within CRC and the manager of the Surface Water Resources and Ecosystems Section of the CRC, and the Chief Executive agreed to those figures as is documented in his signed memo.

Status of activities

8. All applicants at this hearing who are seeking to abstract water from a water body that falls under row xxii, noted in their applications that they would comply with the 5yr 7-day low flow, once it had been assessed by CRC.

9. Given this, the applications were deemed to be complying with row xxii, and as such were considered as discretionary activities. If, after the minimum flows were assessed by CRC, an applicant no longer proposed to comply with that flow, then the application would revert to a non-complying activity.

Claire Penman

WQN9v2 versus Irricalc

Consistency of Approach

10. The Commissioners have requested an analysis of the benefits of a consistent approach being applied to the calculation of annual volumes for the purposes of assessing existing allocation, allocations for replacement applications and allocations for applications seeking to develop new areas of irrigation.

11. Before assessing the benefits, certain points need to be made explicit, as follows.

    a. Consistency in approach, as referred to by the Commissioner panel, is assumed to mean preference of one method for calculating allocation per consent over alternative methods and application of that method in every case.

    b. A consistent approach would need to be related directly to Policy 16 and equate to one of the two methods specified in that policy.

    c. Ability to provide a consistent approach will be limited by factors related to the inputs to each of the Policy 16 methods.

12. It is also important to note that Policy 16 allows for one of two methods and therefore the plan may not anticipate consistency. Each individual application must be assessed on its own merits and it is possible that both WQN9v2 and Irricalc may be policy compliant. It is uncertain how a determination would be made as to which policy compliant method was appropriate for the consistent approach.

13. One of the reasons for including an alternative method to WQN9v2 is the Board was concerned that one of the tables feeding into this method did not include the Mackenzie Basin or rainfall for parts of the lower catchment. They therefore adjusted the policy to allow for site-specific data to be used, if available (paragraph 219 of Annex 1)

Potential benefits of consistency

14. Any changes to estimated allocation would be limited to changes in inputs to the Policy 16 method in relation to each consent or application.

15. The main benefit of a consistent approach is that it would assume 80% efficiency of irrigation across the board, regardless of existing irrigation systems and could force efficiency expectations in the WCWARP to be realised.

Obstacles to achieving consistency

16. Given that Policy 16(c)(i) requires measured data to be used, obtaining that data for existing consents would be a timely and expensive exercise. Policy16(c)(ii) requires knowledge of irrigation area and soil water holding capacity, neither of which is universally available in relation to existing consents.

17. Regarding existing consents, a reasonable use allocation figure will not reflect consented activity in two thirds of existing consents. Existing allocation must record diversions (as per NBTC decision precedent), which includes 10 of 48 existing consents included in allocation. Existing allocation must also accommodate borderdyke systems, which includes 19 of the 48 consents. There are 3 of the 48 consents that have a consented annual volume. In short, the reasonable use tests described in Policy 16 would be most readily applicable to 16 of the 48 consents. Universal application would result in underestimation of existing consented allocation (i.e. consented activities are not tied to a reasonable use test and a consent holder may lawfully carry out an activity that falls short of expectations of reasonable use if consented to do so).

Recommendation regarding consistency

18. Any perceived benefits of a consistent approach are outweighed by the efforts required to overcome the limitations of available information.

19. In addition, the existing allocation figures recorded in CRC's consents database are used as a management tool to estimate consented use (rather than reasonable use), having no legal standing.

20. With respect to applications in process, the WCWARP provides for alternative methods, specifically to enable measured data and locality specific information to be used in place of WQN9v2, recognising the limitations of the WQN9v2 model in the context of the upper Waitaki catchment. The WCWARP also specifically enables consideration of investment in existing irrigation systems with regards to applications for replacement consent.

21. Given the above, I would recommend that each application is assessed on its individual merits in terms of the method used for calculating annual volumes when assessing compliance with Policy 16.

Irricalc vs WQN9v2

22. Irricalc has been employed to produce reasonable use estimates for applicants at this hearing and is likely to meet the Policy 16(c)(i) method specifications where soil moisture measurements, or soil survey PAWs based on soil moisture measurements in the vicinity of the property, are used as inputs.

23. Mr David Painter (March 2009) has undertaken a comparative review of both the Irricalc and WQN9v2 methods. He notes that both methods used field measurements of water flows or stores: rainfall, irrigation and monitored soil moisture in WQN9v2 and lysimeters measurements of water balance components in Irricalc.

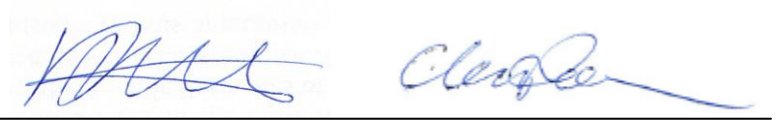
24. I have discussed the use of the upper Waitaki PAW soil maps (created by Trevor Webb of Landcare Research) with CRC Soil Scientist Mr Jeromy Cuff. He has noted that while there may have been some past correlation of the PAW information with soil moisture measurements, this was not done consistently or on a property by property basis.

25. Therefore, for the purposes of compliance with Policy 16(c)(i), an applicant would need to demonstrate that the PAW information used in their Irricalc calculations reflects on-site soil moisture conditions. However, I also note that Irricalc has used soil moisture measurements in creating and calibrating the model, just not at the individual property scale in the Mackenzie Basin.

26. Irricalc figures presented at this hearing invariably exceed WQN9v2 calculations and equal or exceed MIC share allocation for new applications.

27. Included below are some examples showing the difference in volumes calculated using both Irricalc and WQN9v2, and the MIC volume or other annual volume (for replacements) where that is being proposed by the applicants. The volumes being sought by the applicants' at this hearing are in bold italics.

Property (consent)	**WQN9v2 (m3/yr)**	**Irricalc (m3/yr)**	**MIC volume (m3/yr)**	**Other (replacement consents) m3/yr**
Otamatapaio (CRC012047)	1,228,000	1,617,400	n/a	***1,496,760***
Bellfield Land Co (CRC071649)	271,050	378,430	***312,000***	n/a
Grays Hills (CRC042661)	1,101,050	1,190,512	***1,140,000***	n/a
Anderson (CRC012017)	1,333,500	***1,463,150***	n/a	n/a
Five Rivers (CRC061154)	7,743,750	10,427,190	***8,958,000***	n/a



Maria Bartlett & Claire Penman

All other rivers and streams

28. The Commissioners raised a question on interpretation of row xxii, Table 3, in regards to the Hakataramea Minute issued by Commissioner Skelton for the Lower Waitaki hearing. This Minute notes the following:

> Now, even with a whole of catchment approach we think the environmental flow regimes for the tributaries still apply. These are to be found in Table 3 row xxii of the Allocation Plan. This accords with the Plan's policies to protect the smaller streams and discourage water abstractions from them particularly at low flows. Then too, it seems to us to make no sense to say water can be abstracted from a tributary but that tributary's environmental flow regime can be ignored.
>
> Row xxii provides a flow regime which, our view, contains a minimum flow, and a flow sharing provision above the mean flow only. It does not contain an allocation. Consequently, in the case of these applications for water harvesting from the tributaries of the Hakataramea River we consider that harvesting can only commence above the mean flow in the tributary and then only on a flow sharing basis with the tributary.

29. In the subsequent discussion on the above, I considered that even though row xxii of Table 3 does not have an allocation limit, this does not mean that abstraction can only occur above the mean flow. My reasons for this are outlined below:

    a. In the Hakataramea catchment, most applications are for flow harvesting so are different to these proposals that seek to abstract water in times of lower flows. In the Hakataramea catchment, the applicants are only proposing the Hakataramea River flow harvesting minimum flow and not a minimum flow on individual tributaries.

    b. Row xxii is not the only row where there is no allocation limit. This is also the case for the Twizel River (and tributaries), the Awakino River, and the lakes below the top three in the catchment. If it was intended to limit the amount of allocation, I consider this would have been specified. Paragraph 111 of Annex 1, supports this and notes that *"allocation limits are used where the removal of only a small proportion of water is considered appropriate;*[or] *where further allocation is considered inappropriate..."*.

    c. If an applicant proposes to abstract what would be a large allocation, the flow sharing provision above the mean flow will protect variability in those water bodies.

    d. Not all row xxii waterbodies will be subject to Policy 7 as some are much larger than that policy provides for. For example, the Otamatapaio River has a mean annual low flow of 283 l/s, while Policy 7 only applies to streams with a mean annual low flow less than 100 l/s.

    e. Paragraph 120 of Annex states that there is no associated rule to Policy 7, so the plan is not automatically ruling out abstraction from small streams. However, the consent authority has full discretion as to whether it is appropriate to allocate water from individual water bodies.

f. Setting a minimum flow of the 5yr 7-day low flow in row xxii would be pointless if the Plan only intended to allow for allocation above the mean flow. I note that the definition of minimum flow in plan is the point at which the taking and diverting of water from a water body must cease. In other words, if the intention of the Plan was to only allow abstraction above the mean flow, this would become the minimum flow and the entire take would be subject to flow sharing.

Claire Penman

Water metering conditions

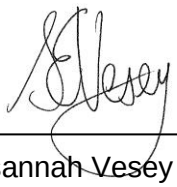
30. The key differences between the metering conditions proposed by Ms Begley and those recommended by the Reporting Officers reports are:

    a. No requirement to install a straight pipe

    b. No condition ensuring meters are calibrated regularly

    c. Explanation for how data would be downloaded and stored is more generic in Ms Begley's evidence. A standard format is specified in the Reporting Officers conditions.

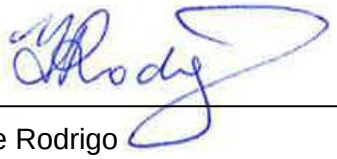
    d. Telemetry optional.



Susannah Vesey

Minor diversions

31. A letter has been sent to Fish & Game, DoC and Runanga seeking their opinion on whether the effects of these diversions could be considered to be minor. This would assist the Commissioners by providing an indication as to whether applications for this activity could be considered as non-notified applications. The letter that was sent to parties is attached.

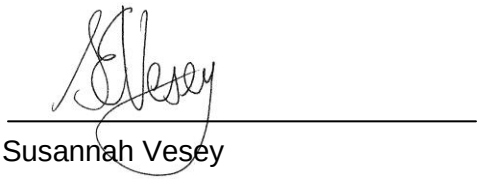


Yvette Rodrigo

Command areas

32. It is not unusual for applications to irrigate a certain number of hectares within a specified "command area" to be lodged with Environment Canterbury. Many farmers seek this for crop rotation purposes. In such instances and for the applications at this hearing where command areas have been proposed; it is standard practise for the Officers auditing the applications to consider each effect on a "worst case" basis. Effects which are given particular consideration are efficiency (depending on soil types in the subject area) and localised water quality. Dr Freeman has advised that command areas will not alter the outcome of the audit of cumulative effects on water quality. I note that command areas are likely to become less common given the rather fixed nature and infrastructure associated with many centre pivots these days.

33. I have discussed the landscape assessment with Mr Glasson and he has confirmed that his evidence presented to the Commissioners takes into consideration the command areas. Where command areas have been proposed he did not know exactly where the applicant would be irrigating and as such has considered the effects of irrigating anywhere within the command area. Mr Glasson notes that where mitigation such as buffer zones are recommended, these would apply to anywhere within the command areas.



Susannah Vesey

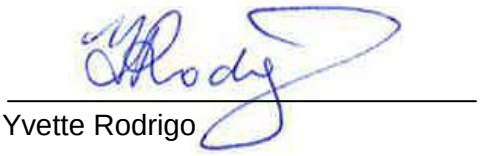
Lack of detail in the applications

34. Over the course of the consent audit process for these applications, many requests for information have been made, including formal requests under Section 92 of the RMA and subsequent informal requests either via email or during meetings with the applicants or their representatives.

35. For many of the applicants details were either not provided or reasons given by the applicant as to why these specific details could not be provided. Primarily, the applicants were hesitant to invest more money into detailed designs (i.e. intakes or irrigation layouts) until they had some certainty of obtaining water through the water consent application process.

36. In addition, for some applications such as Dunstan Peaks, details about the activities at the site have changed since the applications were first submitted to CRC and as late as evidence presented at the hearing recently.

37. As there was no mechanism to recommend that the applications were declined on this basis without proceeding to a hearing and the applicants did not want to postpone the hearing process, the Investigating Officers had to proceed with writing the section 42A reports, audit the assessments and applications and provide recommendations, while taking into account the uncertainties.



Yvette Rodrigo

Dam permits

38. In relation to whether an out-of-stream storage pond requires consent under the Waitaki Plan, advice was sought from the Compliance and Enforcement Section at CRC.

39. At the time of writing the original s42A reports, the advice was that any pond with a bund of less than 1m would be the trigger for whether the effects of the activity would be *de minimis*. Thus CRC Enforcement Officers would use their discretion under the RMA to not enforce requirement for a consent.

40. For the areas of Canterbury outside of the Waitaki Catchment, recent advice within CRC available on the CRC–wide resource, the Rule Implementation Database (as at 13/1/10) is the following:

"Any height of bund above ground constitutes an impoundment of water and therefore is to be considered a "dam". If that "dam" can meet the conditions of Rule WQN37, then we will not enforce the technical requirement for consent under the TRP (which is silent). It would therefore be treated as if Rule WQN37 was operative and a permitted activity. If those conditions cannot be met then a resource consent is required."

41. As the Waitaki Plan has no direction for permitted dams like that provided in Rule WQN37 of the pNRRP, CRC will use Rule WQN37 as guidance for determining consent requirements for out-of-stream ponds in the Waitaki Catchment.

42. If an applicant can comply with the provisions of WQN37, then CRC enforcement will use their discretion and the applicant will not be required to seek a consent. Mr Marty Mortiaux, Team Leader Regulatory Implementation has reiterated to me that this occurs only where it is considered the effects from the activity consent would be required for are trivial. If however, they do not comply with those provisions, then a consent to dam water would be required.

Claire Penman

Effluent removal

43. With regards to the proposed removal of dairy effluent from Simons Hill Station and Simons Pass Station, the applicants propose to provide storage for effluent collected from dairy sheds (not herd homes) and to remove effluent daily, which is to be discharged at an alternative location, site, or sites, as yet unspecified.

44. The applicants' representatives have indicated verbally to CRC that the properties now propose to develop the combined sites over a 10 year period, starting at 1,200 cows in the first year and increasing by 1,200 cows each year to reach the 12,000 cow capacity outlined in evidence presented.

45. The eventual proposed daily volume of diluted dairy shed effluent (assuming 50 litres washdown water[1] and 5.4 litres of effluent per cow[2]) to be collected from 12,000 cows (6,000 cows per property) is estimated to be 664,800 litres (664.8m^3), or 332,400 litres (332.4m^3) per property.

46. In the first year of the revised proposal, which the applicants are expected to outline in the right of reply, the daily volume from the first proposed dairy farm would be 33.2 m^3.

47. Typically, capacity for three days storage is recommended to accommodate situations when discharge may be unable to occur due to weather conditions or when mechanical failure interrupts normal operations, which, for the fully developed proposal, will be equivalent to 2,005,200 litres, or 1,002,600 litres per property.

48. By the fourth year of the proposed development a land use consent would be required for the storage of effluent because the volume of effluent to be stored (providing for 3 days storage) would exceed the limit specified in Condition 1 of Rule WQL29 and WQL30 (permitted activity limit of 100m^3). Consent may be required before that time if the system is designed to accommodate three days storage.

49. The discharge of any effluent trucked off-site is also likely to require additional resource consent, depending on the number, location and ownership of sites where effluent is to be discharged.

50. The trucking of effluent off-site, assuming a tanker size of 28,000 litres[3], would increase over the proposed 10 year development period from 3 to 24 vehicles per day (48 vehicle movements). I expect that the effects of these vehicle movements would be addressed by the applicants when a detailed description of

[1] This is a representative average figure, but actual washdown water requirements may vary between 30 to 100 litres per cow, as referenced in CRC brochure 'A guide to managing farm dairy effluent', May 2007, pg 7.
[2] This figure originates from the Transitional Regional Plan, General Authorisation for Animal Effluent Disposal onto Land.
[3] Based on advice from Fonterra of maximum milk tanker capacity, which complies with maximum weight limits for road transport – it is likely that diluted effluent would have a higher weight ratio per litre, which could result in a lesser tanker capacity to meet weight restrictions.

the modified proposal is provided, together with an assessment of the relevant provisions of the Mackenzie District Council District Plan.

Maria Bartlett

Telemetry

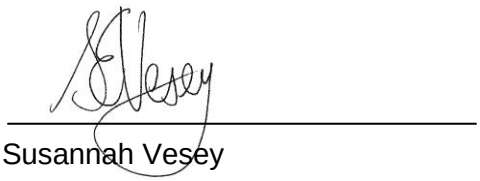
51. I have further discussed the option of telemetry with Mr Young. He agrees that telemetry will not be feasible throughout the catchment. Mr Young notes that many farmers will voluntarily install a telemetered metering system after some cost analysis of the different options. Mr Young agrees with Ms Blakemore's comments below that the main benefit of telemetry is for the applicant with minimum flows and being able to adjust their takes accordingly

52. Mr Young advised there are differing levels of telemetry – rather than the broader scale telemetry to a service provider; the applicants are likely to be able to operate a localised system sending the data from their minimum flow recorder to the farmhouse for example so they can accordingly adjust their takes.

53. Mr Young agrees that in the absence of telemetry, regular data downloads are needed to ensure data is being recorded throughout the season. He notes that applicants', hydrologists often carry this out routinely as standard practise.

54. Ms Lucy Blakemore (Environmental Protection Officer) has provided some more information in regards to the reasons for telemetry. In short, the primary driver is remoteness – effectively monitoring the consents is difficult due to their location. Ms Blakemore suggests the benefits are ultimately for the consent holder - if the EPO's need to visit the sites and gauge the low flow sites the cost to consent holders will be high. Additionally the consent holders need to know on a regular basis how to adjust their takes to comply with minimum flow requirements Ms Blakemore notes that telemetry is also for compliance with their abstractions when it comes to the audit of their takes at the end of the year.

55. If further discussion in regard to metering and monitoring conditions is requested by the Commissioners, I consider it would be appropriate for Mr Young to be present to answer further questions in regards to the technical side of metering.



Susannah Vesey

Native fish species locations with respect to galleries

56. I have re-read Dr Allibone's evidence and the following locations have been mentioned. Additionally Maps 1, 2 and 3 attached to Dr Allibone's evidence identify the distribution of native fish in the Upper Waitaki. I have attached copies of these for your reference.

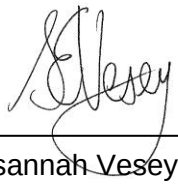
    a. Canterbury galaxias, upland and common bully – widespread in the catchment

    b. Upland longjaw galaxias – rivers and streams upstream of glacial lakes (McCauley River and Cass River), tributaries of the Tekapo River and the upper Ahuriri River

    c. Lowland longjaw galaxias - Ahuriri River downstream of proposed abstractions near Omarama, Otamatapio River

57. In paragraph 76, Dr Allibone notes the need for the fine mesh on fish screens may be alleviated if the spawning time of the koaro was known to occur outside the abstraction season. He recommends that if fine screens are not to be used then a research condition would be appropriate to determine the spawning time and to demonstrated the risk of entrainment is low. He continues in paragraph 78 that he accepts the condition proposed by the Reporting Officers where it can be demonstrated no threatened galaxias are present within 500 metres of the takes.

58. Given this, it may be more appropriate that in the locations identified above, and in the attached maps, such a research condition is needed to establish the presence of threatened species in the vicinity of the proposed abstractions.



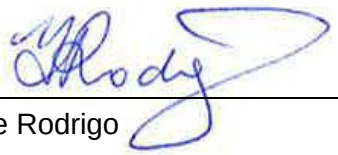
Susannah Vesey

Water quality of the Omarama Stream

59. In paragraph 67 of my addendum report for CRC011362 (Dunstan Peaks Discharge Application), I referred to the water quality of the Omarama Stream not meeting the ANZECC guidelines for dissolved reactive phosphorus or nitrate nitrogen.

60. The reference for this is the "Cumulative water quality effects of nutrients from agricultural intensification in the Upper Waitaki Catchment, Summary Report, GHD, Prepared for Mackenzie Water Research Limited, August 2009". The data is in Table 10 and Table 11. The data reports that the observed mean (number of samples not specified) dissolved reactive phosphorus concentration of 0.01 mg/l

exceeded the ANZECC guideline of 0.009 mg/l, and the median nitrate nitrogen concentration (n=11) of 0.18 mg/l exceeded the ANZECC guideline of 0.167 mg/l..



Yvette Rodrigo