greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Proposed Natural Resources Plan for the Wellington Region

Supplementary Evidence

For Hearing Stream 3

Report date: 20 November 2017

Topic: Water allocation

Report prepared by:

Paula Hammond

Senior Policy Advisor

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1. Introduction and scope

1. My name is Paula Hammond. I wrote the s42A Officer's Report: Water allocation (s42A report) dated 4 August 2017, released in advance of Hearing Stream three. My qualifications and experience are set out in section two of that report.

2. This supplementary evidence responds to Minute #21 from the Hearing Panel in relation to the joint witness statement – hydrology (JWS – hydrology) for the Lower Ruamahanga Groundwater Management Zone.

3. A table (in Appendix 1) lists the provisions where I have recommended amendments, and an assessment under s32AA. Changes that I recommend as a result of this supplementary evidence are shown in blue text that is underlined or ~~struck out~~. Original recommendations from the s42A Report that I continue to support are shown in red text that is underlined or ~~struck out~~.

2. Background

4. The panel received the final JWS – hydrology on 7 November 2017 and subsequently issued Minute #21 requesting a joint witness statement - planning (JWS – planning) on the planning implications of the JWS – hydrology.

5. A JWS – planning was issued on 13 November 2017 outlining the points of agreement as to the changes required to give effect to the JWS – hydrology.

6. The JWS – planning highlighted two further areas that Mr Daysh and myself considered worth exploring as to whether we could find any common ground. The two areas both related to Schedule P (recommended in my s42A report to be included in Policy P107 as Table 4.1).

7. The first area concerned the thresholds for Category B takes and the management approach around these thresholds. Together, with the input of the technical experts (Mr Jon Williamson, Dr Mark Gyopari, Mr Brydon Hughes and Mr Mike Thompson) we came to an agreement on amendments to Schedule P that both parties are all comfortable with. These amendments were presented to the hearing panel as a second joint witness statement on Friday 17 November 2017.

8. The second area concerns the provision in Schedule P that provides for circumstances where hydrogeological evidence demonstrates that the surface water depletion effects of a particular take are less than expected. Where there is clear new hydrogeological evidence, it may be advance by an applicant seeking a new resource consent or an existing user amending an existing resource consent.

9. In my s42A report I recommended a new schedule be added to the proposed Plan (paragraphs 190 - 193) to provide certainty as to the information Council requires to make this assessment.

10. Mr Williamson, in his evidence dated 28 August 2017 (paragraphs 84 - 94), suggested a checklist as an alternative to the schedule I proposed.

11. The parties were unable to agree on an approach.

3. Reclassification of groundwater category for a particular groundwater take

Background

12. As mentioned above, Schedule P allows for local variation where there is clear hydrogeological evidence demonstrating that surface water depletion effects are less than expected.

13. At the pre hearing meetings held in Masterton on 11 April 2017 and 18 May 2017, submitters indicated they wanted certainty as to the type of information that Council would require to show surface water depletion effects are less than expected.

14. At the 18 May meeting Council pre circulated a list of information requirements that I then recommended in my s42 report be included as a new schedule in the proposed Plan.

15. Mr Williamson, in his evidence dated 28 August 2017 (paragraphs 84 - 94), suggested a checklist as an alternative to the schedule I proposed.

Assessment

16. The maps within the proposed Plan (Figures 7.2 – 7.9) delineating where the different groundwater categories are already give a degree of certainty as to the management approach for a particular location. It is only if an applicant considers that their stream depletion effect is less than expected that they need to provide evidence to show it is different.

17. Groundwater users with a Category A classification are most likely to seek a reclassification of their take, to avoid restrictions a minimum flows. Category A takes are subject to the most stringent restrictions at minimum flows (i.e. a 50% reduction).

18. Mr Hughes and Dr Gyopari have assessed Mr Williamson's evidence and his proposed checklist Table 5.

19. Dr Gyopari gave a response to Mr Williamson's evidence in addition to presenting his technical evidence to the hearing panel on Tuesday 6 September 2017. At paragraph 26, Dr Gyopari stated the following:

I consider Mr Williamson's scoresheet proposal rather simplistic or 'black and white' and would potentially lead to some erroneous conclusions. Especially missing from the scoresheet proposal is the ability to assess an appropriate scale for evaluation (consistent with the size of the take and extent of drawdown effects) and an inability to place the take in a cumulative effects context. I consider that a higher level assessment such as provided in the proposed new schedule (Information required for the reclassification of a groundwater take category) could be developed through expert conferencing.

20. Dr Gyopari and Mr Hughes have outlined in technical evidence, appended to this supplementary evidence, the reasons why they do not consider Mr Williamson's checklist/score sheet to be appropriate to determine whether a particular take should be reclassified. I agree with the reasons expressed by Dr Gyopari and Mr Hughes that the checklist is not appropriate.

21. Dr Gyopari and Mr Hughes have proposed an amended version of the schedule recommended in my s42A report. The reason for having a schedule of

information required (rather than a scoring system) is to enable professional judgement on the relative importance of the variety of factors used to determine the stream depletion effect. As Dr Gyopari and Mr Hughes have described these factors will vary from location to location and will also be dependent on parameters such as the rate and duration of the take and proximity to the surface water body.

22. I consider the new schedule proposed below is clearer and provides more guidance than the schedule proposed in my s42A report.

4. Recommendation

23. I recommend the New Schedule: Information required for the reclassification of a groundwater take category suggested in my s42A report be replaced by the following:

Proposed information requirements for evaluation of the streamflow depletion characteristics in order to change the classification of an individual groundwater take
Assessment of potential streamflow depletion characteristics and appropriate hydraulic connectivity classification for an individual groundwater take will be informed by development of a conceptual model which considers the hydrogeological and surface water context at a scale appropriate to the size of the abstraction. The conceptual hydrogeological model will be utilised as the basis to quantify the potential magnitude of streamflow depletion effects resulting from a proposed groundwater abstraction using either a numerical model or approved analytical model. The model should be cognisant of the sensitivity of the depletion assessment to observed geological heterogeneity. Considerations inherent in the assessment may include (but not be limited to): • Local and sub-catchment geology and hydrogeological environments; • Relative groundwater and surface water levels and temporal/spatial variation; • Mapping of groundwater flow nets; • Characterisation of the local and sub-regional groundwater environment including a conceptual or quantitative water balance; • Aquifer hydraulic response to pumping including evaluation of aquifer properties and any aquifer boundary and leakage effects derived from pumping test data collected in accordance with Schedule T; • Surface water hydrology (gauged losses/gains and temporal/spatial variability, flow statistics); • Measurement of streambed conductance, spatial variability or use of GWRC's mapped streambed parameters; • Hydrochemical and/or water quality data to assist conceptual model development.

APPENDIX A: Water allocation – Section 32AA Assessment

Red text amendments = recommendations from the officer's s42A report
Blue text amendments = updated recommendations from the officer's supplementary evidence

Amendment No./Submission point No.	Chapter	Provision	Text of provision with any recommended amendments	Evaluation of amendment (Section 32AA assessment)
Refer to Issue 2.2 of section 42A report: Water allocation	12 Schedules	New schedule	See table below ~~**New Schedule: Information required for the reclassification of a groundwater take category**~~ ~~Wellington Regional Council will require hydrogeological information that appropriately characterises the sub-catchment hydrogeological setting to enable confident evaluation of the potential effects of taking groundwater on hydraulically connected surface water. The information required will depend on local circumstances and may include all or some of the list below.~~ ~~a) analysis of local/sub-catchment subsurface geology/stratigraphy;~~ ~~b) relative groundwater and surface water levels and mapping of groundwater flow nets;~~	**Effectiveness and efficiency** The recommended inclusion of a new schedule will provide greater certainty for groundwater users regarding the information required to reclassify the groundwater category of a particular take. The recommended amendments will increase the effectiveness and efficiency of the proposed Plan. The recommended amendments maintain the intent of the provisions in the proposed Plan and would not alter the meaning or any outcome of the proposed Plan. **Costs** There are no additional costs associated with the recommendation. **Benefits: (environmental, cultural, economic and social)** There are environmental, cultural, economic and social benefits from clearly describing the information required to reclassify a groundwater take category. **Risk of acting or not acting** The risk of not acting is that the decision version will

			~~c) confident conceptualisation of the local and sub-regional groundwater environment including conceptual or quantitative water balance;~~ ~~d) temporal groundwater level and relevant surface water level/flow variations;~~ ~~e) analysis of aquifer testing undertaken in accordance with Schedule T requirements to determine localised aquifer hydraulic properties;~~ ~~f) analysis of results from additional previous aquifer testing from sub-catchment areas to determine representative aquifer parameters;~~ ~~g) evaluation of aquifer boundary effects evident in pumping test data;~~ ~~h) analysis of surface water hydrology (e.g. gains/losses, representative flow statistics);~~ ~~i) measurement/analysis of streambed conductance or use of GWRC mapped~~	not provide certainty for water users. **Decision about most appropriate option** In my opinion the proposed amendment is the most appropriate way to address omissions and inaccuracies identified in submissions and assessed in the section 42A report: Water allocation - Issue 2.2.

			~~streambed parameters;~~ j) ~~hydro chemical analyses.~~[1] Proposed information requirements for evaluation of the streamflow depletion characteristics in order to change the classification of an individual groundwater take Assessment of potential streamflow depletion characteristics and appropriate hydraulic connectivity classification for an individual groundwater take will be informed by development of a conceptual model which considers the hydrogeological and surface water context at a scale appropriate to the size of the abstraction. The conceptual hydrogeological model will be utilised as the basis to quantify the potential magnitude of streamflow depletion effects resulting from a proposed groundwater abstraction using either a numerical model or approved analytical model. The model should be cognisant of the sensitivity of the depletion assessment to observed geological heterogeneity. Considerations inherent in the assessment may include (but not be limited to): • Local and sub-catchment geology and hydrogeological environments;	

[1] Issue 2.2, paragraph 193

			• Relative groundwater and surface water levels and temporal/spatial variation; • Mapping of groundwater flow nets; • Characterisation of the local and sub-regional groundwater environment including a conceptual or quantitative water balance; • Aquifer hydraulic response to pumping including evaluation of aquifer properties and any aquifer boundary and leakage effects derived from pumping test data collected in accordance with Schedule T; • Surface water hydrology (gauged losses/gains and temporal/spatial variability, flow statistics); • Measurement of streambed conductance, spatial variability or use of GWRC's mapped streambed parameters; • Hydrochemical and/or water quality data to assist conceptual model development.	