

**BEFORE INDEPENDENT COMMISSIONERS APPOINTED BY THE  
CANTERBURY REGIONAL COUNCIL AND SELWYN DISTRICT COUNCIL**

**In the matter of**            The Resource Management Act 1991

**And**

**In the matter of**            Applications by **Fulton Hogan Limited** for all  
resource consents necessary to establish, operate,  
maintain and close an aggregate quarry (**Roydon  
Quarry**) between Curraghs, Dawsons, Maddisons  
and Jones Roads, Templeton

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**SUMMARY STATEMENT OF NICHOLAS CHARLES ELDRED ON  
BEHALF OF FULTON HOGAN LIMITED**

**GROUNDWATER**

**DATED: 13 NOVEMBER 2019**

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## **Introduction**

1. My full name is Nicholas Charles Eldred. I hold the position of National Geotechnical Business Group Manager at GHD Limited. I here summarise key points of my evidence, highlighting areas of agreement and disagreement between my opinion and that expressed by or on behalf of submitters and in the s42A report.
2. With respect to this Proposal my involvement has included reviewing the available evidence on groundwater (Regional Council's, Fulton Hogan's and submitters) and the conclusions reached.

## **M Flanagan and J Eagar – TRA Representative**

3. In M Flanagan and J Eagar's submissions concern are raised regarding the proposed mitigation for potential rising groundwater levels. Mr Flanagan and Ms Eagar are concerned that the proposed mitigation of adding fill and raising the level of the quarry floor in response to possible future rising groundwater levels is not realistic.
4. In paragraph 50 of his evidence Mr Van Nieuwkerk recognizes there is some uncertainty in establishing the SHWT. Furthermore, he notes that climate change and the Central Plains Water scheme may also impact long terms trends – both upwards and downwards. He recommends that the SHWT and maximum quarry depth is reviewed every 5 years. I concur with this recommendation.
5. Proposed Condition 6 in Mr Bligh's evidence reflects Mr Van Nieuwkerk's recommendation in regard to a 5 years review based on site specific data. However, I note Mr Bligh in his draft conditions has only allowed for a review after the first five years of operation while Mr Van Nieuwkerks recommends a review every 5 years. I agree with Mr Van Nieuwkerk and understand the revised condition is being drafted.
6. Mr Flanagan is also concerned that if groundwater levels do rise at some time in the future and large areas of backfill are required this will be unrealistic for Fulton Hogan to achieve and they would appeal the condition. He believes that the only realistic way to mitigate the risk is to increase the buffer layer now to allow for expected groundwater rise.
7. J Eager notes in Paragraph 43 of her submission that concern regarding the appropriateness of a 1 metre buffer is supported by the 2016 decision with

respect to the Canterbury Aggregates Producers Group (CAPG) where an additional 1 metre was added to the buffer as an allowance for the possible Central Plains Water effects discussed earlier in my evidence.

8. In response to Mr Flanagan and Ms Eager I note the following:
- (a) The recommended consent condition that requires the SHWT to be reviewed every 5 years will allow the maximum quarry floor level to be adapted in response to observed changes. While an increase in groundwater levels in the area in response to increased irrigation associated with the Central Plains Irrigation scheme is possible, other factors may mitigate these potential effects, such as reduction in overall aquifer recharge due to climate change. Therefore, I believe an adaptive response is appropriate.
  - (b) I also note that following completion of quarrying in any given area Fulton Hogan propose to rehabilitate the quarry floor through the placement of cleanfill followed by at least 300 mm of topsoil. Therefore, the 1 metre buffer will represent a minimum thickness for the buffer layer at the end of extraction. Following rehabilitation the buffer layer will be increased by at least 300mm following the placement of topsoil and probably significantly more through the placement of cleanfill. Therefore, any increase in the SHWT following rehabilitation will need to be significant to require placement of further “virgin materials”.
  - (c) With respect the anticipated response of groundwater levels to the Central Plains Water (CPW) scheme a significant amount of work was completed by CPW on this topic. The studies concluded that the groundwater response within the catchment area of the scheme may be significant – potentially up to several metres. However, Templeton is located downstream and to the east of the scheme. While some response may occur in this area numerical modelling completed by CPW did not specifically provide estimated values. The modelling and reported<sup>1</sup> data suggests values will be less than 2 metres beyond the scheme boundaries but specific data for Templeton is not available.
  - (d) In my opinion, part of the reason why CPW have not made specific predictions regarding groundwater level changes beyond the scheme

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<sup>1</sup> Central Plains Water Limited – Baseline Groundwater Level Assessment – Page 36

boundary is that the complexity of the groundwater system makes this difficult. As discussed in paragraph 11 (b) of my evidence and E Van Nieuwkerk, any modest groundwater response to CPW in this area may be offset by other factors such as climate change impacting recharge, increased drainage to spring fed streams and drains, and changes in groundwater abstraction by wells. Therefore, given the uncertainties the adaptive approach outlined above is appropriate.

**Dr L Scott**

9. In paragraph 35 and 36 of her evidence Dr Scott agrees with the approach adopted by E van Nieuwkerk to calculate the SHWT and notes the assessment looks relatively conservative.
10. In paragraphs 37 to 39 of her evidence Dr Scott discussed the uncertainties regarding future changes to groundwater levels and concludes by noting that the proposed consent condition to refine the groundwater level estimates after the first 5 years of monitoring would be unlikely to provide a high level of confidence regarding changes further in the future.
11. As mentioned earlier in my evidence, I agree with E Van Nieuwkerk's recommendation that the SHWT is reviewed every 5 years and recommend Condition 6 is edited accordingly. Following conferencing with Dr Scott, Mr Mthamo, Mr van Nieuwkerk and myself I believe this has address Dr Scott's concern.

**Nicholas Charles Eldred**

13 November 2019