

Clutha District Council  
PO Box 25  
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New Zealand

15 February 2022

**Attention: Gerry Essenberg**

Dear Gerry

**Review of Compliance Criteria for the Waihola STP RM15364 - Draft**

### Introduction and Qualifiers

In an email dated 10 Feb 2022, Clutha District Council (CDC) requested that Beca Ltd reviewed with urgency, the document prepared by Dr Michael Greer of Aquanet Consulting Ltd titled '**Memorandum to the Commissioner Outlining Potential Effluent Quality and Volume Compliance Criteria for the Waihola STP -- RM15.364**'. A spreadsheet file accompanied the Memorandum, named -- *Michael\_Greer\_Waihola\_STP\_compliance\_criteria\_assessment\_RM15-364\_090222.xlsx*.

No other documents have been provided to Beca, but we have seen some of the information on the Otago Regional Council (ORC) website relating to this consent hearing. Beca staff have not been involved in the consent procurement process so far and had very limited time to review the above document. Beca has not verified the calculations done by Aquanet Ltd. However, we can make the following comments on the Aquanet text. The section and table numbers listed below, refer to the Aquanet document.

### Section 2.2 Methods

- Determining the ninety-fifth percentile compliance criteria using 2<sup>nd</sup> and 3<sup>rd</sup> highest concentrations on a 12-sample rolling basis, is an approach that is not often used, although it is sourced from the NZ WERF Wastewater Monitoring Guidelines 2002.
- Determining the median compliance criteria using 4<sup>th</sup> and 5<sup>th</sup> highest concentrations on a 12-sample rolling basis, is an approach that is not often used, although it is sourced from the NZ WERF Wastewater Monitoring Guidelines 2002.
- In the NZ WERF 2002 reference above, examples of 'proportional' consent conditions are given in Table 13.3. Those conditions are based on grab samples taken 3 per week, fortnightly and monthly. Can Aquanet advise if a 12-sample rolling basis produces similar outcomes to fixed calendar intervals such as weekly or monthly?

- In the Greer spreadsheet file referred to above, the tab 'Compliance\_criteria\_assessment', appears to use 8<sup>th</sup> and 9<sup>th</sup> highest concentrations to calculate the median range (presented in Table 1), contrary to that described in the memorandum (4<sup>th</sup> and 5<sup>th</sup> highest concentrations). This results in a lower median range than would be calculated using 4<sup>th</sup> and 5<sup>th</sup> highest values, as shown in the following table.

Quality Parameter	Median range (Greer ,Table 1)	Median range calculated using 4 <sup>th</sup> and 5 <sup>th</sup> highest concentrations
BOD5, g/m3	72 - 90.1	110.5 - 120
Total Phosphorus, g/m3	5.6 - 6.1	6.8 - 7.6
Ammoniacal Nitrogen, g/m3	22.2 - 23.3	28.6 - 30.2
Suspended Solids, g/m3	100 - 100	130.5 - 140
Faecal coliforms, cfu/100ml	79000 - 98950	221000 - 240000

### Section 3.4 Discussion regarding alternative compliance criteria

- Greer noted that the 2021 average and total discharge volumes were 30% higher than the preceding years (for which data is provided in Table 3) and Greer shows in Table 4 that rainfall totals for 2021 do not explain the 30% higher flows. Because of this observation, CDC may be asked by the Hearings Commissioner if any changes were made to the method of flow measurement about that time, and was the flow measuring device maintained appropriately?
- It is noted that Greer includes the 2021 flows in his analyses, which are summarised in Tables 5 and Table 6.
- In the main part of Table 5, it seems that 'Waipori STP' should be changed to Waihola STP.
- In Table 5, Summary in the row *Implementation of 2021 average volume + 10% buffer*, nitrogen STP contribution of 2.2% is not consistent with load values stated in Table 5, which suggest the STP contribution would be 0.5%.
- In the text below Table 5, Greer notes that the proposed total nitrogen and total phosphorus loads with *Implementation of 2021 average volume + 10% buffer* are "an order of magnitude less than what is expected under applicants preferred approach (single maximum discharge volume of 680 m<sup>3</sup>/day)". It is assumed the Greer comment relates to the consent application for 680 m<sup>3</sup>/day with a concentration of 35 g/m<sup>3</sup> and 10 g/m<sup>3</sup> for total nitrogen and total phosphorus, respectively (concentrations proposed in Table 6 of Clutha District Council Waihola Sewage Treatment Plant Application dated 22 Dec 2015). During higher flow events up to the maximum of 680 m<sup>3</sup>/day, it is likely the concentrations would reduce due to dilution from inflow and direct rainfall on the pond and daily mass loads would not increase significantly. This would require significant measurement (or modelling) and may not be justified.
- In the Summary of Evidence submitted to ORC by Dr Greer on 21 Jan 2022, his paragraph 7 suggests consent conditions could set load-based compliance standards rather than concentration and volume limits. This approach may yield an acceptable result. (<https://www.orc.govt.nz/media/11685/summary-of-evidence-of-michael-greer.pdf>)

### Section 4 Summary

- Table 6: Quantity – Daily maximum presented as 980 m<sup>3</sup>/d, whereas earlier discussion (Table 3) stated 680 m<sup>3</sup>/d (based on 2021 max +10% buffer).

## Interim Conclusions

It would be preferable for the inconsistencies in the Greer memorandum to be amended, before conclusions are reached.

Yours sincerely



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on behalf of

**Beca Limited**

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