

**BEFORE THE COMISSIONER APPOINTED BY  
THE SOUTHLAND REGIONAL COUNCIL**

**In the matter**                      The Resource Management Act (RMA, 1991)

**And**

**In the matter of**                A Resource Consent Application to include land use permits, water permits and discharge permits

**By**                                      Woldwide One Limited and Woldwide Two Limited; Woldwide Four Limited; and Woldwide Five Limited (Applicant)

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**ADDENDUM TO STATEMENTS OF EVIDENCE OF ABIGAIL PATRICIA LOVETT  
FOR SOUTHLAND REGIONAL COUNCIL  
25 September 2019**

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## ADDITIONAL MATTERS

1. I have prepared my evidence in compliance with the Code of Conduct for expert witnesses set out by the Environment Court of New Zealand Practice Note, dated 1<sup>st</sup> December, 2014. I confirm that the evidence I am presenting is within my area of expertise, and that I have not omitted to consider material facts known to me that might alter or detract from these opinions.
2. I prepared two technical reports in response to a request from Environment Southland for expert advice on water quality and water quantity, associated with consent applications from Woldwide One Ltd. and Woldwide Two Ltd.; Woldwide Four Ltd., and Woldwide Five Ltd. Final versions of these documents were delivered to Environment Southland in July, 2019:
  - a. Lovett, A., 2019a. Review of Resource Consent Application by Woldwide One Ltd. and Woldwide Two Ltd. Earth & Environmental Science Report 2019/02, prepared for Environment Southland Regional Council. 55p.
  - b. Lovett, A., 2019b. Review of Resource Consent Application by Woldwide Four Ltd. and Woldwide Five Ltd. Earth & Environmental Science Report 2019/03, prepared for Environment Southland Regional Council. 51p.
3. Following the submission of considerable additional information from the applicant during August 2019, I prepared a supplementary report for Environment Southland and a final version was delivered on the 9<sup>th</sup> September, 2019. The aim of the supplementary report was to address all new information that had been provided by the applicant since delivery of the two technical reports (Lovett, 2019a and Lovett 2019b) in July, 2019.
  - a. Lovett, A., 2019c. Supplementary response report for Woldwide One Ltd. and Woldwide Two Ltd. consent application, and Woldwide Four Ltd. and Woldwide Five Ltd. consent applications. Prepared for Environment Southland Regional Council. 12p.
4. Following submission of the supplementary response report (Lovett, 2019c), further information was submitted by the applicant, including a document titled "*Memorandum of Dr Michael Conrad Freeman 23 September 2019*" (memo). Following review of the memo, I have prepared the following comparative tables, which are intended to easily summarise information presented in the memo for each of the four monitoring sites identified by the applicant.
5. Water quality at Oreti River at Wallacetown
  - a. Comparison of 5-year medians for the period 2013 – 2017 (reported in Freeman (2019) and 2014 – 2018 (reported in Freeman "memo").

Period	2013 – 2017	2014 – 2018
<i>E. coli</i>	130 n/100mL	140 n/100mL
Black disc	1.815 m	1.75 m
Turbidity	Not provided	1.62 NTU
Total Nitrogen	Not provided	1.19 g/m <sup>3</sup>
Total Oxidised Nitrogen	0.94 g/m <sup>3</sup>	0.94 g/m <sup>3</sup>
Ammoniacal-Nitrogen	0.005 g/m <sup>3</sup>	0.005 g/m <sup>3</sup>
Dissolved Reactive Phosphorous	0.006 g/m <sup>3</sup>	0.0055 g/m <sup>3</sup>
Total Phosphorous	Not provided	0.0125 g/m <sup>3</sup>

- b. New data in the memo indicated that all 10-year trends were either not assessed or indeterminate (e.g., insufficient data is available to calculate a trend).
- c. NOF bands for both time periods for *E. coli* were 'D' and for ammoniacal-nitrogen were 'A'.

6. Water quality at Waimatuku Stream at Lorneville – Riverton Highway

- a. Comparison of 5-year medians for the period 2013 – 2017 (reported in Freeman (2019) and 2014 – 2018 (reported in Freeman “memo”).

Period	2013 – 2017	2014 – 2018
<i>E. coli</i>	450 n/100 mL	380 n/100mL
Black disc	1.22 m	1.26 m
Turbidity	Not provided	2.4 NTU
Total Nitrogen	Not provided	3.7 g/m <sup>3</sup>
Total Oxidised Nitrogen	3.0 g/m <sup>3</sup>	3.1 g/m <sup>3</sup>
Ammoniacal-Nitrogen	0.01 g/m <sup>3</sup>	0.005 g/m <sup>3</sup>
Dissolved Reactive Phosphorous	0.0425 g/m <sup>3</sup>	0.044 g/m <sup>3</sup>
Total Phosphorous	Not provided	0.0625 g/m <sup>3</sup>

- b. New data provided in the memo indicates that 10-year trends for several parameters (e.g., *E. coli*, Clarity, Turbidity, Total Nitrogen, Total Oxidised Nitrogen, Ammoniacal-Nitrogen) are ‘very likely improving’. In comparison, dissolved reactive phosphorous is ‘very likely degrading’ and total phosphorous is ‘likely degrading’.
- c. NOF bands for both time periods for *E. coli* were ‘E’ and for ammoniacal-nitrogen were ‘A’.

7. Water quality at Aparima River at Thornbury

- a. Comparison of 5-year medians for the period 2013 – 2017 (reported in Freeman (2019) and 2014 – 2018 (reported in Freeman “memo”).

Period	2013 – 2017	2014 – 2018
<i>E. coli</i>	130 n/100mL	120 n/100mL
Black disc	2.305 m	2.25 m
Turbidity	Not provided	1.53 NTU
Total Nitrogen	Not provided	0.96 g/m <sup>3</sup>
Total Oxidised Nitrogen	0.665 g/m <sup>3</sup>	0.665 g/m <sup>3</sup>
Ammoniacal-Nitrogen	0.005 g/m <sup>3</sup>	0.005 g/m <sup>3</sup>
Dissolved Reactive Phosphorous	0.006 g/m <sup>3</sup>	0.006g/m <sup>3</sup>
Total Phosphorous	Not provided	0.014 g/m <sup>3</sup>

- b. New data provided in the memo indicates that 10-year trends for several parameters (e.g., *E. coli*, Turbidity, Total Oxidised Nitrogen, and Dissolved Reactive Phosphorous) are ‘very likely improving’, whereas parameters that are ‘likely improving’ include Clarity, Total Nitrogen, Total Phosphorous. Trend for Ammoniacal-Nitrogen was not assessed.
- c. NOF bands for both time periods for *E. coli* were ‘D’ and for ammoniacal-nitrogen were ‘A’.

8. Water quality at Orauea River at Orawia Pukemaori Road

- a. Comparison of 5-year medians for the period 2013 – 2017 (reported in Freeman (2019) and 2014 – 2018 (reported in Freeman “memo”).

Period	2013 – 2017	2014 – 2018
<i>E. coli</i>	315 n/100mL	240 n/100mL
Black disc	1.13	1.18 m
Turbidity	Not provided	3.8 NTU
Total Nitrogen	Not provided	0.825 g/m <sup>3</sup>
Total Oxidised Nitrogen	0.415 g/m <sup>3</sup>	0.505 g/m <sup>3</sup>
Ammoniacal-Nitrogen	0.005 g/m <sup>3</sup>	0.005 g/m <sup>3</sup>
Dissolved Reactive Phosphorous	0.011 g/m <sup>3</sup>	0.01 g/m <sup>3</sup>
Total Phosphorous	Not provided	0.027 g/m <sup>3</sup>

- b. Additional data provided in the memo indicates that 10-year trends for several parameters (e.g., Black Disc, Turbidity, Dissolved Reactive Phosphorous, Total Phosphorous) are 'very likely improving', whereas *E. coli* is 'likely improving'. In comparison, Total Nitrogen is 'very likely degrading' and Total Oxidised Nitrogen is 'likely degrading'. Trend for Ammoniacal-Nitrogen was not assessed.
  - c. NOF bands for both time periods for *E. coli* were 'E' and for ammoniacal-nitrogen were 'A'.
9. As described in my evidence and that from the applicant - water quality in all four major surface water bodies that receive drainage from the applicant's properties is degraded. In addition, water quality does not (or is unlikely to) meet relevant standards or guidelines (e.g., all sites show 'E' or 'D' gradings for *E. coli* in relation to the National Objectives Framework (NOF) standards).
  10. Although some water quality parameters show 'very likely improving' or 'likely improving' trends, a number of parameters continue to show 'likely degrading' or 'very likely degrading' trends.
  11. Furthermore, the state of the water quality parameters provides an indication of the current state of the surface water environment (more so than trends, which do not address the actual state of the water quality). Overall, additional new water quality information presented in the Freeman memo from LAWA datasets does not provide any information that changes those points previously presented and discussed in the technical reports (Lovett 2019a and Lovett, 2019b), supplementary report (Lovett 2019c) and statement of evidence.
  12. Having reviewed the additional information provided by the applicant since completion of previous technical documents, I remain of the opinion that considerable omissions in the application remain, and therefore the true assessment of the proposed activities on the receiving environment is incomplete. These omissions include:
    - a. No assessment of the effect of increased abstraction from bore E45/0071\*;
      - \*Note: a typo existed in the report and statement of evidence identified this bore as E45/007
    - b. No assessment of the effect of increased abstraction from bore D45/0345;
    - c. No apparent cumulative effects assessment on the receiving environment for proposed activities on the Horner Block and Woldwide Runoff; and
    - d. No apparent description of how soil moisture management is actually implemented or how relevant soil moisture data is used to determine current soil conditions to ensure effects of FDE application are minimised.
  13. Lovett 2019a, Lovett 2019b, and Lovett 2019c were independently peer reviewed for technical quality assurance by Jens Rekker of JH Rekker Consulting Ltd. Jens has more than 20 years' experience in water resources management, including considerable experience in Southland.



Abigail Lovett, 26 September, 2019

## References

Freeman, M., 2019. Water quality assessments. Woldwide One Limited and Woldwide Two Limited & Woldwide Four Limited and Woldwide Five Limited. Report prepared for Woldwide One Limited, Woldwide Two Limited, Woldwide Four Limited and Woldwide Five Limited.