

IN THE MATTER

of the Resource Management Act
1991

AND

IN THE MATTER OF

a review of resource consent
conditions under 128 of the
Resource Management Act 1991

BY

**MANAWATU-WANGANUI
REGIONAL COUNCIL**

AND

an application for change of consent
conditions under section 127 of the
Resource Management Act 1991

BY

**HOROWHENUA DISTRICT
COUNCIL**

**STATEMENT OF REBUTTAL EVIDENCE OF OLIVIER MICHEL NICOLAS
AUSSEIL (WATER QUALITY) ON BEHALF OF HOROWHENUA DISTRICT
COUNCIL**

16 September 2016

BUDDLE FINDLAY
Barristers and Solicitors
Wellington

Solicitors Acting: **David Allen / Victoria Brunton**
Email: david.allen@buddlefindlay.com
Tel 64-4-499 4242 Fax 64-4-499 4141 PO Box 2694 DX SP20201 Wellington 6140

1. EXECUTIVE SUMMARY

1. My name is Olivier Michel Nicolas Ausseil.
2. My rebuttal evidence is given in relation to the review of resource consent conditions initiated by Horizons Regional Council ("**Horizons**") and the application for change of consent conditions by Horowhenua District Council ("**HDC**") in relation to the Levin Landfill located at 665 Hokio Beach Road (the "**Landfill**").
3. I have the qualifications and experience set out at paragraphs 15-28 of my statement of evidence in chief ("**EIC**") dated 2 September 2016.
4. I repeat the confirmation given in my EIC that I have read the 'Code of Conduct' for expert witnesses, which is now contained in the Environment Court Practice Note 2014 and that my evidence has been prepared in compliance with that Code.

2. SCOPE OF EVIDENCE

5. In this statement of rebuttal evidence I will respond to the evidence of Ms Kathryn McArthur.

3. EVIDENCE OF MS KATHRYN JANE MCARTHUR

6. The evidence of Ms McArthur raises the following issues that I am able to assist the Panel with:
 - (a) In paragraphs 16, 17 and 20 Ms McArthur raises concerns about the effectiveness of the monitoring on Hokio Stream with regards to dissolved oxygen and BOD;
 - (b) In paragraph 22 Ms McArthur criticises my reliance on an assessment of the ANZECC guidelines against the median values of metal concentrations; and
 - (c) In paragraph 23, Ms McArthur raises concern regarding the level of uncertainty associated with my analysis and conclusions, as a result of the likelihood of contamination of the upstream site by leachate.

BOD and Dissolved Oxygen monitoring in the Hokio Stream

7. With regards to BOD and dissolved oxygen (DO), the following points are particularly relevant:
- (a) My understanding is that the monitoring results in the Hokio Stream are expressed as Total BOD₅;
 - (b) The One Plan target relative to BOD is expressed as Soluble carbonaceous BOD₅ (ScBOD₅). ScBOD₅ is a sub-set of Total BOD₅. This means that compliance with the One Plan target cannot be directly assessed on the basis of the monitoring data available. The proportion of samples meeting the One Plan target referred to by Ms McArthur in her paragraph 20 should therefore be taken as a conservative indication only;
 - (c) Relatively elevated concentrations of TBOD₅ are regularly measured at all Hokio Stream monitoring sites. The high planktonic algae loads from Lake Horowhenua (described in Mr Brown's evidence at paragraph 34 and Photo 3) are primarily particulate organic matter and would form part of the TBOD₅ concentrations. This is likely to explain, at least in part, the relatively elevated TBOD₅ concentrations measured at all three Hokio Stream sites;
 - (d) At this stage, and this point does not appear to be disputed by Ms McArthur, there is no evidence to suggest that the discharge of leachate is causing any detectable change in TBOD₅ concentrations in the Hokio Stream, noting however the degree of uncertainty associated with the upstream monitoring site, an aspect I comment on further in this evidence. On that basis I do not agree with Ms McArthur that the continuous DO monitoring described in her paragraph 17 is warranted at this stage.
8. Based on the above considerations, my recommendations are as follows:
- (e) Water quality monitoring should be undertaken at an additional monitoring site at a location where it is clear of the plume of groundwater from the closed landfill site.
 - (f) Monitoring at the current HS1 should be continued for a period of time (2-3 years), to allow for comparison with the new upstream site, and could be discontinued after that.

- (g) The in-stream monitoring list of analytes should be changed to require ScBOD₅ analyses instead of TBOD₅, to enable a direct comparison with the One Plan target; and
- (h) Should a significant and ecologically relevant increase in the concentration of ScBOD₅ be identified in the future between upstream and downstream sites, then consideration should be given to continuous DO monitoring, possibly as part of the next review process.

Assessment of ANZECC guidelines

- 9. In response to Ms McArthur's paragraph 22, and the comparison I undertook of the measured in-stream median metal concentrations against the ANZECC Guidelines Trigger values, I simply followed the procedure described in the ANZECC Guidelines document itself, as per footnote 2, paragraph 65(c) of my EIC.
- 10. I note that other considerations were also included in my assessment, including the overall proportion complying with the trigger value, and any changes between upstream and downstream monitoring sites.

Uncertainties associated with the location of the monitoring sites

- 11. In Paragraph 23, Ms McArthur expresses her views that there is a “high level of uncertainty” associated with my analysis and conclusions “as a result of the likelihood of contamination of the upstream site by leachate.”
- 12. Whilst I agree the location of the upstream site does introduce a degree of uncertainty, it is, in my opinion, important to understand which of my analyses and conclusions are subject to that uncertainty (and to what degree), and those that are not.
- 13. Firstly, I have relied on Mr Douglass’s opinion that the upstream monitoring site has the potential to be influenced by shallow groundwater from the closed landfill area. I also understand from Mr Douglass that the downstream site (HS3) is downstream of the Tatana Drain confluence and likely captures most, if not all of the groundwater plume from the closed landfill. This means that comparison between sites HS1 and HS3 provides a reliable estimate of the effects of the direct discharge of leachate via Tatana Drain on water quality in the Hokio Stream, plus the proportion of the groundwater entering the stream between these two sites. I understand from further discussions with Mr Douglass that it is likely that the bulk of the

leachate travelling via groundwater enters the Hokio Stream between sites HS1 and HS3. The uncertainty lies in the possibility that a proportion of leachate-contaminated groundwater may enter the stream upstream of SH1, thus influencing the results at that site.

14. Similarly, the “middle” site (HS2) is located upstream of the Tatana Drain confluence. This means that comparison between HS2 and HS3 provides a reliable estimate of the effects of the direct discharge of leachate via Tatana Drain, plus the proportion of the groundwater entering the stream between these two sites.
15. In my opinion, if the discharge of leachate (via both groundwater and the Tatana Drain) was causing major changes in the concentrations of various water quality indicators in the Hokio Stream, then some degree of increase would be perceptible between sites HS1, HS2 and HS3. In other words, the proportion of leachate potentially entering the stream upstream of HS1 could “mask” a relatively small increase (that might have been detectable otherwise), but not a major one. This is in my opinion the extent of the uncertainty caused by the location of the upstream monitoring site. This uncertainty should be lifted by the further water quality monitoring I have recommended at the existing and additional further upstream monitoring site.
16. Importantly, the comparison of concentrations of metals with the ANZECC trigger values was undertaken on the basis of the concentrations measured at each site independently. As explained above, the downstream site HS3 is likely to capture most, if not all, of the leachate-contaminated groundwater, plus the direct discharge via Tatana Drain. The concentrations of metals¹ and ammoniacal nitrogen meet the ANZECC trigger values and One Plan targets at this site. Therefore, even if the discharge was causing a discernible increase in concentrations of these indicators, it is not to the extent which would cause more than a low risk of toxic effect on aquatic life.

Dr Olivier Ausseil

16 September 2016

¹ With the exception of aluminium, as explained in paragraph 54(g) of my EIC