

**BEFORE THE TARANAKI REGIONAL COUNCIL AND NEW PLYMOUTH
DISTRICT COUNCIL**

MT MESSENGER BYPASS PROJECT

In the matter of the Resource Management Act 1991

and

In the matter of applications for resource consents, and a notice of requirement by the NZ Transport Agency for an alteration to the State Highway 3 designation in the New Plymouth District Plan, to carry out the Mt Messenger Bypass Project

**STATEMENT OF EVIDENCE OF MARTIN WILLIAM NEALE (FRESHWATER
ECOLOGY) ON BEHALF OF THE NZ TRANSPORT AGENCY**

17 July 2018

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QUALIFICATIONS AND EXPERIENCE

1. My name is Martin William Neale.
2. I am an Environmental Scientist and Director at Puhoi Stour Limited.
3. I hold the qualifications of BSc (Hons) Biological Sciences (University of Plymouth, UK, 1995), MSc Environmental Quality (Bournemouth University, UK, 2000) and a PhD in Freshwater Ecology (University of Ulster, UK, 2004).
4. I am a member of the Royal Society of New Zealand, the Society for Freshwater Science, the Freshwater Biological Association, Water New Zealand and the New Zealand Freshwater Sciences Society. I am an active member of the scientific community, publishing and reviewing papers for international journals and maintain an Honorary Lecturer position at the University of Auckland
5. I have 18 years' experience of research and management of freshwater environments, with experience gained in the public and private sectors in Europe (2000 to 2007) and New Zealand (2007 to present).
6. In my previous roles at Auckland Regional Council/Auckland Council between 2007 and 2015, I oversaw the development of the Stream Ecological Valuation ("**SEV**") and Environmental Compensation Ratio ("**ECR**") tools and their subsequent implementation into the management of freshwater in Auckland. I have also advised other Councils' on the use of the SEV and ECR tools in their regions. During this time, I also managed the regional State of the Environment monitoring and applied environmental research programmes, including a range of complex environmental research and monitoring programmes covering air quality, soil science, biodiversity, marine and freshwater. I have been working as a consultant environmental scientist since 2015, working on a diverse range of projects for the private and public sector.
7. I provided freshwater expertise to Auckland Council throughout the development, consultation and hearing phases of the Unitary Plan. I have provided expert evidence in the Environment Court, at EPA Board of Inquiry hearings, the Proposed Auckland Unitary Plan (PAUP) hearings, Plan Change hearings, Resource Consent hearings and court prosecutions.
8. I confirm that I have read the 'Code of Conduct' for expert witnesses contained in the Environment Court Practice Note 2014. My evidence has been prepared in compliance with that Code. In particular, unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

BACKGROUND AND SCOPE OF EVIDENCE

9. The New Zealand Transport Agency ("**Transport Agency**") has engaged me to advise it on its proposed Mt Messenger Bypass Project ("**Project**") to improve the section of State Highway 3 ("**SH3**") between Ahititi and Uruti, to the north of New Plymouth.
10. I note that I did not produce a statement of evidence as part of the Transport Agency's main set of evidence that was filed on 25 May 2018 - this is my first statement of evidence.
11. My evidence addresses the potential effects of the Project on freshwater ecology values. In particular, in my evidence I:
 - (a) comment on the analysis carried out in respect of effects on freshwater ecology values, and the proposed measures to address those effects as of the date the Transport Agency's evidence in chief for the Project was filed. In doing so I address:
 - (i) the Assessment of Ecological Effects - Freshwater Ecology ("**Freshwater Ecology Report**") included as Technical Report 7b, Volume 3 to the AEE and the supplementary report dated March 2018 ("**Freshwater Ecology Addendum**");
 - (ii) the relevant chapters of the Ecology and Landscape Management Plan ("**ELMP**") as filed with the Transport Agency's evidence on 25 May 2018;
 - (iii) the evidence in chief ("**EIC**") of Mr Keith Hamill in respect of freshwater ecology; and
 - (b) comment on the updated measures for addressing the actual and potential ecological effects of the Project as it relates to freshwater ecology. In doing so, I am commenting on the updated measures as described by Mr Hamill in his supplementary evidence, and set out in more detail in the updated ELMP being filed with Mr Roan's supplementary evidence.

COMMENTS ON FRESHWATER ECOLOGY ISSUES AS THE PROPOSAL STOOD WHEN EVIDENCE IN CHIEF WAS FILED

12. The documents I have reviewed contain a comprehensive assessment of the freshwater resources in the project area using a range of appropriate techniques. Recognising this is a complicated project, with some residual uncertainty about the footprint, the work provides an appropriate assessment of the potential effects of the Project on the freshwater resources, and outlines a package of proposed mitigation and offsets that should provide for no-net-loss of freshwater ecological function in the long term.

13. Taking into account best practice mitigation approaches, the assessment identified two key areas where the residual effects (after avoid, remedy and mitigate) are required to be offset through the restoration package. These are identified in Table 5 of Mr Hamill's evidence dated 25 May 2018. I support the transparent approach taken in the table of describing all of the potential effects, identifying which of those can be managed through mitigation and how those effects that require environmental compensation are identified.
14. In my opinion, the assessment and approach taken to assess and manage the freshwater effects of the Project is generally appropriate. I agree with the sentiment that the SEV and ECR are tools that require professional judgement in their application and deviation from this approach may be appropriate in certain circumstances. For example, I support the approach to manage areas of high value in a more conservative way (i.e. doubling ECR values for the kahikatea swamp forest area).
15. Nevertheless, I identified a small number of areas that merit clarification or amendment and I describe these below.

Fish passage

16. Most of the culverts proposed as part of the Project have been designed in accordance with best practice guidelines for fish passage. However, there are a small number of culverts that will have impaired fish passage. The effect of these culverts is likely to be minimal because:
 - (a) the habitat that will be affected by this issue are relatively small lengths of typically intermittent or ephemeral stream channel; and
 - (b) surveys of these streams have shown limited use of these locations by native fish.
17. Coupled with the proposed offsets that will result in relatively large-scale improvements in fish habitat, the overall effects of these culverts would likely be minimal at the catchment scale. Notwithstanding this effects assessment, I recommend that the requirement for, and design of, the Project culverts continues to be reviewed as the final Project design is confirmed, to ensure any impacts on fish passage are minimised.

Culvert SEV scores

18. Overall, I think the assessment used realistic SEV scores in the ECR calculations for impact and offset sites. However, related to the fish passage issue described above, I have some concern about the impact SEV score used for some culverts in the assessment as set out in Mr Hamill's EIC.
19. I consider the use of an impact SEV score of 0.23 is appropriate for those culverts that are designed and built in accordance with best practice (described in section 4.3.1.3 of the Freshwater Ecology Report). This is

because these culverts will provide hydrological and biological connectivity between upstream and downstream reaches and therefore retain some of the functions of a stream channel. In my experience, the use of an impact value for culverts of this magnitude is consistent with similar applications of the SEV/ECR tool.

20. In this project, an issue arises because this score was applied to all culverts, including those high gradient culverts with baffles (that will reduce fish passage) and those culverts with no fish passage provision. For these culverts, the biological connectivity function will be impaired and therefore, in my opinion, a lower SEV score would be more appropriate to reflect the greater impact (or lesser ecological function) of these culverts.

Stream diversions

21. The SEV/ECR tool has been applied in an unconventional way for some of the stream diversions. I accept the argument that the potential for future improvement is not lost in these diversions, but it should be recognised that achieving functioning stream systems in diversions is challenging.
22. However, the application of a 0.5 multiplier to these situations, so that the diverted stream length is restored plus another 50% of the diverted length, has a similar effect as using the SEV/ECR in the conventional manner. Therefore, in terms of the outcome achieved, the approach used in this project creates no meaningful difference from using the SEV/ECR in the conventional way.
23. Given this approach is likely to result in a similar outcome, I have no substantive concerns, but I think the reference to an ECR of 0.5 may lead to some confusion. In my experience of the ECR, such a ratio would imply that half of the impacted stream length is being restored. In fact, 1.5 times the impacted stream length is being restored in this case, so I would be inclined to state that this is equivalent to an ECR of 1.5.

Length inconsistencies

24. The stream lengths impacted by culverts and diversion vary slightly between Table 2.1 and Table 2.12 in the Freshwater Ecology Addendum. I do not think these inconsistencies are consequential given the overall scale of the project, but they create some uncertainty in the assessment that requires clarification or amendment.

COMMENTS ON THE UPDATED MEASURES TO ADDRESS FRESHWATER ECOLOGY EFFECTS

25. Following my review of the application documents and Mr Hamill's evidence in chief, there have been several changes that are described primarily in Mr Hamill's supplementary evidence and reflected in an updated ELMP.

Amongst other things, these changes cover three issues that I identified in my review, namely:

- (a) culvert design and fish passage;
- (b) updated SEV/ECR calculations; and
- (c) length inconsistencies.

26. Mr Hamill's supplementary evidence details changes to the proposed design of eight culverts that will reduce impacts on fish passage through a variety of modifications, including:
- (a) removal of the need for two culverts (one of which will be replaced with a bridge);
 - (b) reducing culvert gradients;
 - (c) increasing culvert diameters; and
 - (d) increasing embeddedness.
27. All of these interventions will reduce impacts on fish passage compared with the original assessment.
28. For those culverts that remain and will likely impact fish passage, Mr Hamill has revised the impact SEV scores in the offsetting calculations. In my opinion, reducing the impact score in his calculations from 0.23 to 0.15 for these steep culverts is appropriate and more accurately reflects the ecological functioning of the proposed culverts.
29. Mr Hamill has also clarified why length inconsistencies exist in the two tables in his original freshwater Technical Report. I am satisfied by these explanations.
30. In addition, the changes to the ELMP include proposed increases in monitoring efforts to assess the effects of the project. I support this increased monitoring effort.

OVERALL COMMENTS ON PROPOSED OFFSETTING PACKAGE

31. In my experience, there is a high-level aspect of the offsetting package that is unusual for a development project and offers some benefits that are not fully captured within the SEV/ECR framework.
32. This is because the proposed restoration sites in this project are all downstream of high quality streams with largely native forest catchments. This contrasts with many restoration projects, whereby the actions are undertaken in stream reaches within urban or rural catchments. As a result, I agree with Mr Hamill's assessment (Section 4.4.2 of Freshwater Ecology Report) that the benefits of the restoration in this project are far more certain

to accrue, as the restoration areas will benefit from largely natural water quality and quantity regimes from upstream, together with a reliable source of animals to colonise the restored reaches. The benefit of restoration in areas downstream of native forest has been demonstrated to result in greater responses in fish (Jowett et al, 2009) and invertebrate (Neale & Moffett, 2016) communities.

33. Furthermore, the benefits to the fish and invertebrate communities from this restoration activity are not fully captured in the SEV/ECR framework. This is because the method focusses on changes in physical habitat, and therefore improvements in these biological communities are not explicitly included in the assessment. As a result, there are likely to be additional ecological benefits arising from the location of the restoration sites that can be factored into an overall assessment of the Project.
34. In addition, the potential use of large wood generated by the vegetation clearance (Section 8.3.3 ELMP) for in-stream habitat enhancement (Section 4.4.4 ELMP) will offer additional benefits not captured in the SEV/ECR framework.
35. The freshwater assessment has identified the quantum of stream restoration required to achieve no-net-loss using the SEV/ECR methodology, which doesn't take into account the additional benefits described in the previous paragraphs. When these additional benefits are factored into an overall assessment, it gives me confidence that the freshwater offset package should provide a net improvement in ecological functioning in the medium to long term.

Martin Neale

17 July 2018

References

Jowett IG et al 2009. Effects of riparian manipulation on stream communities in small streams: two case studies. *New Zealand Journal of Marine and Freshwater research* 43 (763-774).

Neale MW & Moffett ER 2016. Re-engineering buried urban streams: Daylighting results in rapid changes in stream invertebrate communities. *Ecological Engineering* 87 (175-184).