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

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STATEMENT OF REBUTTAL EVIDENCE OF BRUCE SYMMANS (GEOTECHNICAL MATTERS) ON BEHALF OF THE NZ TRANSPORT AGENCY

30 July 2018

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INTRODUCTION

1. My name is Bruce Symmans.

2. This rebuttal evidence is given in relation to applications for resource consents, and a notice of requirement by the NZ Transport Agency ("**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 ("**Project**"). It is my third statement of evidence for the Project, following my evidence in chief ("**EIC**") dated 25 May 2018 and my supplementary statement of evidence ("**Supplementary Evidence**") dated 17 July 2018.

3. I have the qualifications and experience set out in my EIC.

4. I repeat the confirmation given in my EIC that I have read the 'Code of Conduct' for expert witnesses and that my evidence has been prepared in compliance with that Code.

5. In this evidence I use the same defined terms as in my EIC and Supplementary Evidence.

RESPONSE TO EVIDENCE

6. This evidence responds to the evidence of Richard Duirs on behalf of DOC. I note that Mr Ridley provides a more detailed response to Mr Duirs in his rebuttal evidence.

POTENTIAL FOR FAILURES OF SEDIMENT CONTROL MEASURES

7. Mr Duirs suggests in paragraph 4.13 of his evidence that construction of erosion and sediment control devices within the terrain of the Project presents an increased risk of failure. He also implies that erosion and sediment control devices might consist of rudimentary engineered measures.

8. Mr Duirs also states in paragraph 4.13 that failure of erosion and sediment control devices during significant rainfall events is a relatively common occurrence, even where best practice measures are implemented.

9. I disagree with Mr Duirs' statements on risk and potential failures of erosion and sediment control devices.

10. All temporary earthworks for the Project, including erosion and sediment control devices, will be designed or reviewed by a Geotechnical Engineer. The purpose of this is to ensure they are fit for purpose, safe, and robust.

11. All erosion and sediment control devices will be designed to achieve a minimum factor of safety of 1.2. This is an industry wide standard and where adopted will present an extremely low risk of failure.

12. A factor of safety of 1.2 means that the structure has 20% more capacity, in terms of stability, or resistance than is required to withstand the combination of forces or loads likely to be applied to it. Be that by flood level, sediment accumulation, steep slopes, poor foundation conditions or the like.

13. The erosion and sediment control structures will be geotechnically designed with consideration of the founding ground conditions, likely flood levels and the topography of each site.

14. The minimum factor of safety is calculated with the site conditions (including terrain) factored into the analysis. This means the overall risk for these structures is no different to that of a flat site. That is, to achieve the same factor of safety (or likelihood of failure) on a steep slope, more extensive engineering will be required. This additional level of engineering is already accounted for in the Project design.

15. This specific engineering design, particularly for the more significant dam type structures, will result in structures that are far from rudimentary.

16. The risk of failure of these engineered devices is extremely low. Contrary to Mr Duirs' view, the occurrence of failures of geotechnical-engineered erosion and sediment controls is extremely low. Throughout my career of dealing with earthworks projects, including more challenging sites than this, I am not aware of a single stability or structural related failure of an engineered erosion and sediment control device.

PRACTICAL IMPLEMENTATION OF EROSION AND SEDIMENT CONTROL DEVICES

17. Mr Duirs (Paragraphs 4.5 and 4.12) raises concerns about the practicality of constructing best practice erosion and sediment control measures on the challenging parts of the site. He uses the examples of steep slopes and incised valley systems.

18. I have participated in a number of design workshops for this Project, concerning the proposed construction methods for stream diversion and erosion and sediment control measures, as outlined in the Construction Water Management Plan and summarised in the evidence of Mr Ridley and Mr Milliken. My involvement has included a review of the stability of the proposed temporary works (to facilitate the construction methodology) as well as the permanent works.

19. In my opinion the proposed measures are able to be implemented and are practical from a stability and engineering perspective.

Bruce Symmans

30 July 2018