

## **MT MESSENGER BYPASS PROJECT: SUMMARY OF EVIDENCE OF RICHARD DUIRS (EROSION & SEDIMENT CONTROL) FOR DOC**

1. I am a Senior Environmental Planner with Wainui Environmental Limited. My role includes overseeing erosion and sediment control management on high risk, earthworks projects in the North Island. I am currently engaged by the Waikato Regional Council to undertake compliance monitoring of a number of large scale earthwork sites in the Waikato region. I have gained significant experience in erosion and sediment management on large scale earthworks projects throughout New Zealand in my 15 year career including on a number of NZTA projects.

### **Consent Conditions**

2. For reasons set out below, I support the inclusion of:
  - Prescriptive conditions regarding erosion and sediment control design and management specifications; and
  - Requirement for continuous turbidity monitoring at both upstream and downstream locations and on sediment ponds.
3. In addition, I recommend that these conditions should be updated to include:
  - Requirement for continuous monitoring data to be made available to both TRC and key stakeholders including DOC, either by weblink or similar means, so that the performance of the site can be assessed remotely as an added means of transparency and compliance monitoring.
  - Requirement for specific ecological response measures to mitigate for any identified adverse sediment effects.

### **Erosion and Sediment Risks**

4. The application proposes significant construction earthworks through very challenging terrain, with complex construction methodologies, at an isolated location and with high value receiving watercourses.
5. In relation to the ecological values associated with the site receiving waters, I rely on Dr Drinan's evidence that these have significant values ([3.4] and [5.11] EIC). I consider that these activities present a high risk for adverse erosion and sediment effects within these receiving waters.
6. Although the earthworks area/volumes are less than some of the other NZTA Projects seen around the country (e.g. Transmission Gully, Huntly Bypass, Puhoi to Warkworth) the four-year timeframe is the same duration as the construction programme for some of these larger projects (EIC [3.5] - [3.6]). Mr Ridley says this timeframe allows for an appropriately and carefully managed and controlled process. We appear to agree. The timeframe reflects the care that will need to be

taken (e.g. the need to complete discrete areas in stages) because of the challenging, complex and high-risk nature of the Project site and activities.

7. Mr Ridley refers to a number of other NZTA roading projects which are much larger and have been constructed through challenging terrain and environmental conditions. I consider that an earthworks project does not have to be significant in scale to present a risk of adverse erosion and sediment effects. I have observed many smaller scale sites where adverse effects have arisen. Furthermore, I have also worked on a number of these types of large scale roading projects and despite best endeavours to implement best practice erosion and sediment management, have observed adverse sediment discharge effects occurring both due to the practical limitations of these management measures to effectively treat sediment runoff during all conditions, as well as the complete failure of these measures resulting in direct sediment discharges into receiving environments.
8. I maintain that in this instance due regard must be given to the high value, largely intact headwater stream ecosystems that will be directly impacted by these activities, which I consider to be relatively unique when compared to other large scale roading projects undertaken within New Zealand.
9. For these reasons I maintain that the project presents a high risk for adverse erosion and sediment effects.

#### **Erosion and Sediment Management**

10. I do not agree with Mr Ridley that one can conclude that the increase in sediment *is unlikely to be detectable* (Ridley EIC at [137]) or that the erosion and sediment effects of the Project *will be negligible* (Ridley Supplementary at [37]).
11. I generally consider the Applicant's proposed erosion and sediment control methods to be reflective of best practice methods typically implemented for large scale earthworks projects in New Zealand. However, I consider there are challenges for these best practice erosion and sediment control measures to be implemented effectively at all times, particularly through the central portion of the site (CH2000-4550).
12. Effective treatment function cannot be guaranteed. Erosion and sediment control measures typically comprise temporary/rudimentary measures constructed by an earthworks contractor with limited geotechnical engineering design or construction oversight. I do not consider that the application documents include any specific geotechnical design or testing requirements, additional to other large-scale earthworks projects, that provide an increased level of assurance that the risk of failures will be avoided.
13. I concur with Mr Ridley (Rebuttal [16]) that there are times when diversion channels or silt fences may not perform as expected and can overtop. These occurrences will result in the direct discharge of site sediment runoff into receiving environments with no form of treatment. In addition, I consider that failure of sediment control devices is a reality that does occur particularly on steep, constrained sites during significant rain events and can result in significant adverse effects.

### **Potential Sediment Effects**

14. The Applicant's calculated sediment yield equates to a significant increase in sediment volumes entering waterbodies immediately below the site.
15. The exposed earthworks surfaces will result in significant increases in the volume and velocities of runoff from the site (compared to the existing forested catchments which currently buffer runoff effects through their canopy cover, leaf litter layers and undulating ground conditions).
16. I consider an increase of 46% in the small Mangapepeke Stream is a significant increase in sediment.

### **Sediment Monitoring and Mitigation**

17. In my evidence I refer to the Applicant's CWDMP which outlines proposed sediment control performance and receiving environment monitoring measures to test whether specific triggers are being breached and if so, proposed measures to remediate any ongoing issues.
18. Considering the high risk nature of these activities in terms of adverse sediment effects and the high quality ecological receiving environments, I have recommended the use of continuous water quality monitoring systems to assess site performance and water quality impacts. This is on the basis that continuous monitoring provides the most robust and accurate method for:
  - assessing the effectiveness of site sediment control measures throughout a storm event to determine compliance with the specified triggers; and
  - to determine the impact of site discharges upon water quality within the receiving watercourses.
19. The Applicant has now updated their CWDMP to include provision for continuous sampling at downstream locations/directly below the earthworks in each catchment with the data collected to be assessed against pre-works baseline data. I question the ability of only using two continuous monitoring units downstream of the works (with this data to be assessed against historic, baseline data) to provide an accurate and realistic method for assessing compliance with the site performance triggers during a storm event. In particular, the ability to assess this data rapidly and accurately against historic baseline data from a storm event of exactly the same magnitude, seasonal and catchment conditions.
20. To ensure that peak sediment runoff effects and appropriate responses are captured and implemented, I maintain that implementation of continuous monitoring at both upstream and downstream locations within both catchments provides the most accurate means to assess compliance with the triggers and to quantify the water quality effects of the activities.

21. In the absence of any specific ecological mitigation measures being proposed by the Applicant to account for the potential adverse sediment effects of the project that may occur, I recommend that an appropriate ecological mitigation response should be provided if adverse sediment effects are detected within downstream environments.
22. Responses to date have been limited to feedback loops for the 'continuous improvement' of erosion & sediment control measures, and further monitoring in the Mimi Swamp Forest (my EIC [6.3], [6.4] bullet point 2 – 4, [6.13] – [6.14] and [9.10]).
23. However, Mr Hamill now agrees that there is a gap in the feedback between ecological monitoring and any response (Hamill Rebuttal at [60]).
24. I understand that Mr Hamill proposes independent reviews of ecological monitoring and a response if the Project ecologist considers that effects are "moderate or greater" (Hamill Rebuttal [60] and flow diagram in Appendix 1).
25. I am encouraged that the Applicant has now proposed a feedback loop for ecological mitigations, should adverse events occur. Dr Drinan comments further on this further including the additional ecological monitoring proposed in the updated CWDMP and ELMP documents. I also refer to Dr Drinan's evidence for possible mitigation responses ([10.5] EIC). I agree with Dr Drinan that any response should be additional to the extent of habitat enhancement proposed by the Applicant for direct habitat loss/impacts. I agree with Dr Drinan that the choice of measure and timeframe would appropriately be determined in association with the Ecological Review Panel and TRC.