



Trans-Tasman Resources Ltd marine consent application
Worst Case Scenario Modelling - Summary Statement

Date 30/03/2017

Statement by Dr Alexis Berthot and Dr David Petch

1. Qualifications and experience

1. Review of the sediment dispersal modelling was undertaken by Dr Alexis Berthot as principal reviewer supported by Dr David Petch.
2. Dr Alexis Berthot has more than 16 years' experience in coastal, ocean and estuarine research as well as consulting experience and has provided professional services for a wide range of coastal and ports projects. Alexis obtained a Bachelor in Environmental Sciences, Univ. of Marseille (France) in 1997, a Masters in Marine Environmental Science, Univ. of Marseille (France) in 1999 and a PhD in Coastal Oceanography, Univ. of Western Australia (Australia) in 2005. Alexis' experience includes technical lead for major hydrodynamic and sediment dispersion studies, peer reviewer for technical report and international scientific journals, undertaking sediment dispersion studies including numerical modelling and monitoring, technical advice for dredge plume studies, brine water discharge and dewatering discharge and Environmental Impact Assessments in coastal and ocean environment. He is also the author of several scientific reports, conferences papers and papers published in international peer reviewed journals.
3. Dr David Petch has 27 years' experience in marine environmental consulting and research throughout Australia and extensively overseas, particularly in Asia. David has provided a wide range of technical inputs into ports and dredging and waste disposal projects in marine waters. David has extensive experience with auditing approvals documentation on behalf of regulators at all levels particularly that associated with dredging and disposal of material at sea. David obtained a Bachelor of Science (Hons) in Zoology in 1982 and a PhD in Zoology at University of Melbourne in 1988.

2. Summary

4. Trans-Tasman Resources Ltd (TTRL) proposes to extract titanomagnetite sand (iron sand) from an area in the South Taranaki Bight. The Environmental Impact Assessment (EIA) and proposed project application are currently being processed by the Environmental Protection Authority. GHD has been engaged by the New Zealand Environmental Protection Authority (EPA) as an expert for the review of the sediment plume dispersion work.
5. GHD has been involved in the joint expert conferencing, and following the court hearing a teleconference was organised for all experts to define a potential worst case scenario for the sediment plume modelling. The modelling of this worst case scenario has now been undertaken and the Decision Making Committee has requested that the modelling experts review the results and prepare brief statements addressing the materiality of any changes between the original modelling study outputs and the worst case scenario output recently modelled.
6. GHD has reviewed the HRW 2017 Worst Case Scenario Sediment Plume Modelling report and NIWA 2017 -Plume Modelling – Worst Case Scenario report.
7. Review of the reports shows that the sediment modelling undertaken for the worst case scenario has been undertaken with a sound technical methodology and using parameters defined in the “Joint Statement of Experts in the Field of sediment Plume Sediment Plume Modelling – Setting Worst Case Parameters – February 2017 (JSoE 2017).
8. It should be noted that all comments presented in the Joint Statement of Experts (JSoE 2017) are still relevant. This statement should then be considered in conjunction with the statements presented in the Joint Statement of Experts (JSoE 2017), which included for example (but are not limited to):
 - a. “We have endeavoured to define a worst case scenario using the parameters available in the model and combining parameters in a way that could lead to the worst sediment discharge from the integrated mining vessel (IMV). However, we have not defined this worst case scenario based on the potential outcome at a receptor or for a particular marine species (as we have not discussed this with marine ecologists)”.
 - b. “The independent experts have not been provided with the complete reports including a full analysis of the sediment samples and cannot verify the validity of the sediment fractions that have been used in the modelling. The experts have had to make assumptions on the PSD and processing rate onboard the IMV based on verbal accounts from Dr Dearnaley, who has been informed by TTR, without being able to review how the values have been derived”.

Key outcomes of our review are:

9. The conclusions of the worst case scenario modelling presented in HRW 2017 and NIWA 2017 are sound and substantiated by the model results.

10. The plume behaviour for the worst case scenario is similar to that previously presented with small differences in suspended concentration and sediment deposition away from the dredging operations. Largest increase in suspended sediment concentration, up to 1 order of magnitude, are observed close to the dredging operation and for the 99th Percentile. Away from the dredging and near the coast the increase in suspended sediment concentration remain well below the background levels.
11. Similarly to the suspended sediment concentration, the sediment deposition patterns for the worst case scenario are analogous to that previously presented, with an increase in sedimentation closer to the dredging operation.
12. With regards to the sediment plume modelling methodology and processing of the results, there is no aspect of the work that may be considered material for changes between the worst case scenario and original modelling outputs, except that the level of SSC and sedimentation have increased, and should be considered by marine ecologists in order to determine the potential impact of the increase on the receptors.