

IN THE MATTER of the Exclusive Economic Zone and Continental Shelf
(Environmental Effects) Act 2012

AND

IN THE MATTER of a Decision-Making Committee appointed by the
Environmental Protection Authority to consider a marine
consent application by Trans-Tasman Resources Ltd to
undertake activities in the South Taranaki Bight restricted by
the Exclusive Economic Zone and Continental Shelf
(Environmental Effects) Act 2012

**STATEMENT OF EVIDENCE OF MICHAEL EDWARD HUBER
(PHYSICAL ENVIRONMENT, MARINE MAMMALS AND FISH, AND BENTHIC
ECOLOGY)**

26 March 2014



Environmental
Protection Authority
Te Mana Rauhi Taiao

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INTRODUCTION

1. My name is **Michael Edward Huber**.
2. I am a Senior Executive Marine Scientist and am employed by Sinclair Knight Merz (SKM).
3. SKM has been engaged by the Environmental Protection Authority (“EPA”) to:
 - (a) conduct an initial review of technical reports prepared as part of the Trans-Tasman Resource Ltd marine consent application, with a focus on the disciplines of the physical environment, benthic communities, marine mammals, fish, squid and zooplankton. The findings of this initial review were provided in reports describing the adequacy of information presented and identifying any gaps in the information;
 - (b) prepare a peer review report of the effects assessment in the Trans-Tasman Resource Ltd marine consent application and impact assessment (“the application”) relating to the physical environment, benthic communities, marine mammals, fish, squid and zooplankton;
 - (c) consider submissions and additional advice, information or reports given in relation to the marine consent application; and
 - (d) participate in expert conferencing, and the hearing of the marine consent application, if directed to do so by the Decision-Making Committee.
4. In my capacity as an SKM employee, I have prepared, in conjunction with my SKM colleagues Mr Miles Yeates, Dr Gareth Taylor, and Dr Tobias Probst, the reports listed below. During the preparation of the reports I engaged with my colleagues in drafting, reviewing and revising the reports through an iterative process of exchanging draft reports or sections of reports, literature searches and reviews, and discussion of various issues relevant to the reports. The reports we produced are:
 - (a) A report entitled *Review of Technical Reports Relating to the TTR Marine Consent Application – Oceanographic Processes and the*

Physical Environment, dated 13 December 2013. I engaged with Miles Yeates in preparing this report by reading the application documents cited in that report, discussing the documents, reviewing and adding to or revising working drafts and sections, and reviewing and finalising the report for submission to the EPA. Gareth Taylor assisted by searching for and reviewing relevant literature. I also engaged with Miles Yeates in reviewing and addressing comments made by my SKM colleague Mr Bruce Clarke as part of SKM's internal quality control process. I also engaged with Miles Yeates in reviewing and addressing comments provided by the EPA on a first version of the final report submission;

- (b) A report entitled *Review of Technical Reports Relating to the TTR Marine Consent Application – Benthic Ecology*, dated 13 December 2013. I engaged with Tobias Probst in preparing this report by reading the application documents cited in that report, discussing the documents, reviewing and adding to or revising working drafts and sections, and reviewing and finalising the report for submission to the EPA. Gareth Taylor assisted by searching for and reviewing relevant literature. I also engaged with Miles Yeates in reviewing his comments on a draft version of the report and in responding to comments made by my SKM colleague Mr Bruce Clarke as part of SKM's internal quality control process. I also engaged with Miles Yeates in reviewing and addressing comments provided by the EPA on a first version of the final report submission;
- (c) A report entitled *Review of Technical Reports Relating to the TTR Marine Consent Application – Marine Mammals and Fish*, dated 13 December 2013. I engaged with Miles Yeates in preparing this report by reading the application documents cited in that report, discussing the documents, reviewing and adding to or revising working drafts and sections and providing technical inputs to be incorporated into the document, and reviewing and finalising the report for submission to the EPA. Gareth Taylor assisted by searching for and reviewing relevant literature. I also engaged with Miles Yeates in reviewing and addressing comments made by my SKM colleague Mr Bruce Clarke as part of SKM's internal quality control process. I also engaged with Miles Yeates in reviewing and addressing comments provided by the EPA on a first version of the final report submission;

- (d) a report entitled *Assessment of Effects on Marine Mammals, Fish, Zooplankton and Squid From the Trans-Tasman Resources Marine Consent Application*, dated February 2014. I engaged with Miles Yeates in preparing this report by discussing our overall findings and approach, reviewing and adding technical inputs and comments to an initial draft prepared by Mr Yeates and reviewing technical comments and a literature review provided by Gareth Taylor. I also engaged with Miles Yeates in reviewing and addressing comments made by my SKM colleague Mr Bruce Clarke as part of SKM's internal quality control process, and engaged with Miles Yeates in reviewing, discussing and addressing comments provided by the EPA on a first version of the final report submission;
- (e) a report entitled *Assessment of Effects on Benthic Ecology From the Trans-Tasman Resources Marine Consent Application*, dated February 2014. I engaged with Miles Yeates in preparing this report by discussing our overall findings and approach, reviewing and adding technical inputs and comments to an initial draft prepared by Mr Yeates and reviewing technical comments and a literature review provided by Gareth Taylor. I also engaged with Miles Yeates in reviewing and addressing comments made by my SKM colleague Mr Bruce Clarke as part of SKM's internal quality control process, and engaged with Miles Yeates in reviewing, discussing and addressing comments provided by the EPA on a first version of the final report submission; and
- (f) a report entitled *Assessment of Effects on the Physical Environment From the Trans-Tasman Resources Marine Consent Application: Oceanographic and Coastal Processes*, dated February 2014. I engaged with Miles Yeates in preparing this report by discussing our overall findings and approach, reviewing and adding technical inputs and comments to an initial draft prepared by Mr Yeates and reviewing technical comments and a literature review provided by Gareth Taylor. I also engaged with Miles Yeates in reviewing and addressing comments made by my SKM colleague Mr Bruce Clarke as part of SKM's internal quality control process, and engaged with Miles Yeates in reviewing, discussing and addressing comments provided by the EPA on a first version of the final report submission.

5. In addition to those reports, SKM was also engaged to conduct a review of Trans-Tasman Resources reports relating to the sediment plume model used in the impact assessment. Dr Chennon Chin was the author of this review and prepared a report entitled *Assessment of Effects on the Physical Environment From the Trans-Tasman Resources Marine Consent Application: Sediment Plume Model*, dated March 2014. I participated in a teleconference with Miles Yeates and Chennon Chin to discuss our reports listed at 4(a) and 4(f) above to clarify our findings and ascertain whether they were consistent with those of Dr Chin, which was the case.
6. A link to those reports is provided in **Annexure A** to this statement of evidence.
7. The final versions of the reports listed above accurately describe my conclusions, based on the information available at the time they were prepared. There is no disagreement among the individuals who contributed to the reports on any of the conclusions therein.
8. In preparing the report listed in paragraph 4(f) above I had access to and read the evidence-in-chief submitted on behalf of TTR by Matt Brown, Dr Alan Orpin, Dr Mark Hadfield, Dr Malcolm Green, Dr Richard Gorman, Dr Iain MacDonald, Dr Shaw Mead, Dr Terry Hume, Dr Matt Pinkerton, and Dr Kay Vopel. Where specific comments or conclusions relied upon this information the Evidence is cited in the report.
9. Since finalising the reports listed in paragraph 4(d) and 4(e) above I have reviewed the evidence-in-chief relevant to benthic ecology, marine mammals, fish, zooplankton and squid prepared on behalf of TTR by Dr Dan McClary, Martin Cawthorn, Dr Tara Anderson, Dr Alison MacDiarmid, Dr Janet Grieve, and Dr Simon Childerhouse.
10. Since finalising the reports listed in paragraph 4 above, I have also reviewed the evidence-in-chief of submitters relevant to the disciplines of the physical environment, benthic ecology, and marine mammals, fish, zooplankton and squid, as published on the EPA website. This evidence includes, but is not limited to, that provided by Andrew Baxter, Dr Bernd Gerhad Würsig, Kristina Hillock and Dr Peter Longdill (Department of Conservation), Dr Marie Brown (Environmental Defence Society), Dougal

Greer, Dr Brian Paavo and Dr Elizabeth Slooten (Kiwis Against Seabed Mining), Douglas Gordon (Fisheries) and Karen Pratt.

11. I have also reviewed a large number but not all of the public submissions available in the EPA website, with a focus on issues raised relevant to the disciplines of the physical environment, benthic ecology, marine mammals, fish, zooplankton and squid.
12. I worked collaboratively with Miles Yeates in a range of expert conferencing sessions, and contributed to the drafting of ten separate Joint Witness Statements summarising the outcomes of expert conferencing in the subject areas of sediment plume modelling, coastal stability, optical effects, marine mammals, fish and zooplankton, benthic ecology (2 statements), primary productivity, waves and surf, and bathymetry and oceanographic processes.
13. Mr Yeates and I approached preparation for the expert conferencing in a collaborative manner by discussing the issues to be addressed, organising relevant documents, and preparing for each individual conference. We adopted this collaborative approach due to the breadth of subject matter SKM has been engaged to consider. Miles Yeates and I attended all conferencing sessions together, however during the conferencing I participated solely in an individual expert capacity. I also reviewed and commented on the Joint Witness Statements from the expert conferencing in an independent individual capacity. After the conferencing sessions we collated our independent comments and views and transmitted them together for inclusion in the statement as a matter of expediency. My contributions to the Joint Witness Statements reflected my individual opinions and not the collective views of myself and Mr Yeates, or of SKM or the EPA.
14. Shortly before and during the expert conferencing, some additional or revised information was made available that had not been previously available but was considered during the conferencing. Such information is referenced in or attached to the relevant Joint Witness Statements.

QUALIFICATIONS AND EXPERIENCE

15. I have the following qualifications and experience relevant to the evidence I have provided.
- (a) A Bachelor of Science in Oceanography (*magna cum laude*) from the University of Washington, August 1975; a Bachelor of Science in Zoology from the University of Washington, December 1975; and a Doctor of Philosophy in Oceanography from Scripps Institution of Oceanography, University of California San Diego, December 1983.
 - (b) After completing my undergraduate studies and before completing my post-graduate studies I was employed for 8 months by Dames and Moore consulting engineers to manage a water quality analysis laboratory on the Trans-Alaska Oil Pipeline project. After completing my postgraduate studies I held teaching and research positions in marine science at Scripps Institution of Oceanography, University of California San Diego, from 1983-1988. During this period I also held teaching positions in zoology at San Diego State University, and in oceanography at Southwestern College (Chula Vista, California).
 - (c) From 1988 to 1994 I was a Lecturer/Senior Lecturer in the Biology Department of the University of Papua New Guinea. During this period I also served as Head of Department of the Motupore Island Research Department, responsible for the management and academic direction of marine biology and fisheries field research facilities including the research station on Motupore Island. During this period I also sometimes conducted marine environmental science consultancies, consisting of baseline surveys, environmental impact assessments, and sustainable development/conservation project, through the University's commercial arm.
 - (d) From 1994 to 1998 I was the Scientific Director of the Orpheus Island Research Station, a marine science field research facility operated by James Cook University of North Queensland. During this period I held a concurrent appointment as Senior Lecturer in Marine Biology, and also sometimes conducted marine environmental science consultancies, including baseline surveys, environmental impact assessments,

sustainable development/conservation, and coastal management training projects, through the University's commercial arm.

- (e) From 1998 to 2006 I was Senior Partner of Global Coastal Strategies, an marine environmental science consultancy that I founded. After 2006 this ceased to be a full-time role, however I continue to conduct consultancy projects in this role from time to time, primarily for United Nations and other international organisations.
- (f) Since 2006 I have been employed by SKM as a marine environmental scientist. I also serve as SKM's global Practice Leader for Marine Ecology, a role that involves overseeing the technical quality of SKM's capabilities and products.
- (g) On a number of projects I have been engaged as a consultant in technical disciplines directly relevant to my role in this application, including the use of hydrodynamic modelling, assessment of the environmental impacts of sediment plumes, dredging, underwater noise, and contaminant discharges, the design and implementation of marine environmental monitoring programs, and the development of environmental management plans. I have listed some indicative relevant projects that I have worked on at **Annexure B**.
- (h) I am co-author of the university textbook Marine Biology, which is revised and updated every 2-3 years (currently in 9th edition). This requires that I maintain a broad overview of current developments in a wide range of marine science disciplines.
- (i) My relevant advisory and independent review experience includes the following.
 - (i) In 2014 I was one of three International Experts in a review team engaged by the Australian Department of Environment to conduct an independent review of the draft Great Barrier Reef Region Strategic Assessment prepared by the Great Barrier Reef Marine Park Authority.
 - (ii) In 2013 I served on an review team engaged by the Australian Department of Environment to conduct an independent review of

the draft Great Barrier Reef Coastal Zone Strategic Assessment prepared by the Queensland Government.

- (iii) I have been engaged on a number of occasions by United Nations organisations to advise on marine environmental issues. Examples of these are provided in **Annexure C**.
- (j) I am a member of a number of relevant associations and hold registrations including:
 - (i) Environment Institute of Australia and New Zealand.
 - (ii) American Association for the Advancement of Science.
 - (iii) Pacific Science Association.
 - (iv) International Society for Reef Studies.
 - (v) Member Emeritus and Past Chairman, United Nations Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP).
 - (vi) Lifetime Instructor's Credential in marine science from the California Community Colleges system.

CODE OF CONDUCT

- 16. I confirm that I have read, and agree to comply with, the Code of Conduct for Expert Witnesses as contained in Schedule 4 of the Judicature Act 1908 and the Environment Court Consolidated Practice Note 2011.
- 17. In particular, unless I state otherwise below, 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.

SCOPE OF EVIDENCE

- 18. When co-authoring the reports described at paragraph 4 above, I relied upon:
 - (a) the marine consent application impact assessment (supporting information) and technical reports relevant to the physical environment, benthic ecology, marine mammals, fish, squid and zooplankton (as

referenced in my respective reports described in paragraph 4 above;
and

- (b) published scientific literature or other information relevant to the application which is available in the public domain, as cited in the reports.

19. At that time I had not reviewed the evidence provided by the parties to the application and further information requested by the EPA (except as otherwise noted in the reports and at paragraph 8 above), and had not attended expert conferencing or contributed to the drafting of joint statements.

A handwritten signature in black ink, consisting of several overlapping, stylized loops and strokes, likely representing the name Michael Edward Huber.

Michael Edward Huber

26 March 2014

ANNEXURE A

REPORTS PREPARED FOR THE EPA

1. Review of Technical Reports Relating to the TTR Marine Consent Application - Oceanographic Processes and the Physical Environment, dated 13 December 2013; http://www.epa.govt.nz/Publications/Trans-Tasman%20Resources%20Irons%20Sand%20Project_Review%20of%20technical%20reports%20on%20physical%20environment.pdf
2. Review of Technical Reports Relating to the TTR Marine Consent Application - Benthic Ecology, dated 13 December 2013; http://www.epa.govt.nz/Publications/Trans-Tasman%20Resources%20Irons%20Sand%20Project_Review%20of%20technical%20reports%20on%20benthic%20ecology.pdf
3. Review of Technical Reports Relating to the TTR Marine Consent Application - Marine Mammals and Fish, dated 13 December 2013; http://www.epa.govt.nz/Publications/Trans-Tasman%20Resources%20Irons%20Sand%20Project_Review%20of%20technical%20reports%20on%20marine%20mammals%20and%20fish.pdf
4. Assessment of Effects on Marine Mammals, Fish, Zooplankton and Squid From the Trans-Tasman Resources Marine Consent Application, dated February 2014; http://www.epa.govt.nz/Publications/SKM_TTR_Marine_mammals_and_fish_26.02.14.pdf
5. Assessment of Effects on Benthic Ecology From the Trans-Tasman Resources Marine Consent Application, dated February 2014; http://www.epa.govt.nz/Publications/SKM_TTR_Benthic_Ecology_26.02.14.pdf and
6. Assessment of Effects on the Physical Environment From the Trans-Tasman Resources Marine Consent Application: Oceanographic and Coastal Processes, dated February 2014. http://www.epa.govt.nz/Publications/SKM_TTR_Physical_Environment_26.02.14.pdf
7. Assessment of Effects on the Physical Environment From the Trans-Tasman Resources Marine Consent Application: Sediment Plume Model,

dated March 2014.

http://www.epa.govt.nz/Publications/Sediment%20plume%20model%20040314_FINAL.pdf

ANNEXURE B

INDICATIVE RELEVANT PROJECT EXPERIENCE

- 2010-2014** **Project Manager and Technical Lead**, Environmental Management Program (Marine Ecology) for Dredging and Disposal, Hay Point Coal Terminal Expansion Project. Relevant components include impact assessment of blasting and pile driving noise on marine mammals, turtles and fish; aerial and land-based surveys of marine mammals and other megafauna; water quality monitoring; ecological monitoring of infauna and epibenthic communities; management and risk assessment of non-indigenous marine species; and preparation and implementation of an Environmental Management Plan.
- 2010-2014** **Project Manager and Marine Technical Lead**, Environmental and Social Impact Assessment, Vinh Tan 3 thermal power station, Vietnam. Relevant components include direction and interpretation of hydrodynamic modelling of dredging and cooling water plumes, design and interpretation of infauna and epibenthic surveys, and assessment of sediment contamination.
- 2012-2013** **Project Manager**, Improved Dredge Material Management for the Great Barrier Reef Region Project, for the Great Barrier Reef Marine Park Authority. The project included commissioning, oversight and interpretation of hydrodynamic modelling of sediment plumes; comparative risk assessments of sea disposal of dredged material at alternative spoil grounds; and development of a framework for water quality monitoring of dredging and disposal operations.
- 2009** **Lead Author**, Baseline desktop fisheries study, Port Hedland Outer Harbour Development, Western Australia.
- 2000-2009** **Marine Ecologist**, Vavouto Industrial Complex, Koniambo Nickel Project (New Caledonia). Project work included application of hydrodynamic modelling of dredging plumes and offshore wastewater discharge in impact assessment; development of Environmental Management Plan including design and implementation of baseline monitoring; and assessment of effects of underwater noise from dredging, shipping and pile driving on marine mammals and turtles.
- 2006-2009** **Project Director and Senior Scientist**, Water quality and ecological risk assessment and monitoring, Gold Coast Desalination Plant.
- 2008-2009** **Project Manager**, Sediment quality assessment and development of Long-Term Management Plan, and Sea Dumping Permit application for Port of Weipa, Queensland.
- 2007** **Lead Author**, international literature review of best environmental practice in infrastructure development in sensitive marine areas, for Woodside Petroleum.

ANNEXURE C

INDICATIVE EXAMPLES OF ADVISORY EXPERIENCE TO UNITED NATIONS ORGANISATIONS

- 2010-2011** **Consultant**, Final Evaluation of the Yellow Sea Large Marine Ecosystem Project. For United Nations Office of Project Services and United Nations Development Programme. Joint project of the Republic of Korea and China with support from the Global Environment Facility. Duties included reviewing technical project outputs and delivering the keynote address on "Requirements of the Regional Network on Ecosystem Assessments & Monitoring to Assessing the Impacts of Management Actions" to the project-sponsored International Symposium on Marine Ecosystem Assessment: Systematic Design & Requirements.
- 2008-2009** **Author**, Analytical summaries of regional marine environmental assessments in the South Pacific and Southern Indian Ocean regions, and global assessments on marine contamination from land-based activities, for UN Environment Programme and Intergovernmental Oceanographic Commission
- 2008** **Marine Expert**, Independent review for Pointe aux Caves Thermal Power Plant Project, for United Nations Development Programme and Ministry of Environment, Mauritius. Review of Environmental Impact Assessment and advice on approval decision and recommended approval conditions.
- 2006** **Sole Consultant**, Preparatory work for establishment of a regular United Nations process for global marine assessment. For United Nations Environment Programme and Intergovernmental Oceanographic Commission through the World Conservation Monitoring Centre.
- 2005-2006** **Coordinating Lead Author**, marine and coastal chapter of *Global Environment Outlook-4*, for United Nations Environment Programme.
- 2000-04** **Steering Committee**, Global International Waters Assessment (GIWA), for United Nations Environment Programme.