

**BEFORE THE ENVIRONMENTAL PROTECTION AUTHORITY
AT WELLINGTON**

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

AND

IN THE MATTER of an application for marine consent under section 38 of the EEZ Act by Trans-Tasman Resources Limited to undertake iron ore and processing operations offshore in the South Taranaki Bight

BETWEEN **Trans-Tasman Resources Limited**
Applicant

AND **Environmental Protection Authority**
EPA

AND **Fisheries Inshore New Zealand Limited, New Zealand Federation of Commercial Fishermen Inc, Talley's Group Limited, Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited**
Fisheries Submitters

**PRIMARY EXPERT EVIDENCE OF HELEN MARGARET ANDERSON
ON ENVIRONMENTAL PLANNING FOR FISHERIES SUBMITTERS**

Dated: 23rd January 2017

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SUMMARY OF EVIDENCE

1. My name is Helen Margaret Anderson and I am Principal Planner with Jacobs New Zealand Limited (**Jacobs**).
2. I summarise my evidence, according to the key headings in this statement, as follows:

Sustainable Management and Uncertain or Inadequate Information

- (a) In order to achieve the purpose of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (**EEZ Act** or **Act**) decision-makers must apply the information principles and take into account any uncertainty or inadequacy in the information available. The EPA must favour caution and environmental protection where the information available is uncertain or inadequate. If this means an application is likely to be refused, the EPA must first consider whether an adaptive management approach is appropriate. Best environmental practice requires any adaptive management approach to be based on adequate baseline information to enable changes in the environment to be monitored. Modelled information cannot be a substitute for real baseline information.

Impact Assessment

- (b) I have reviewed Trans-Tasman Resources Limited's (**TTR** or **Applicant**) proposed activity description and the requirements for such activities under the EEZ Act. I concur with the marine consent requirements identified by TTR in its Impact Assessment.
- (c) Some terminology used by TTR in the Impact Assessment and technical reports is not consistent in terms of input data, activities analysed and terminologies used, and as such it is difficult to determine the actual level of effects of the proposed mining operation.

Proposed Consent Conditions

- (d) I consider that the Baseline Environmental Monitoring as required by proposed condition 14 should be undertaken prior to the marine consent being granted in order to ensure that there is a sufficient understanding of the existing environment and background levels to enable an adaptive management approach.
- (e) Assuming information is made available and it is established that there is sufficient baseline information against which to take an adaptive management approach, I consider that a number of the conditions require amendment.

Fisheries Submitters' Concerns

- (f) Fisheries Submitters have identified a range of concerns with the TTR seabed mining proposal. Aspects of their concerns are supported by the technical reviews undertaken by Fisheries Submitters' experts on: (a) marine ecology and biophysical effects of the sediment plume; (b) the robustness of the laboratory testing and plume modelling; (c) effects on coastal processes; and (d) effects on fisheries management.
- (g) The Fisheries Submitters are particularly concerned about the effects of the sediment plume on the fisheries resource. This concern is supported by the expert reviews undertaken by Dr Greg Barbara and Mr Joris Jorissen in the areas of marine ecology and biophysical effects of the sediment plume and the robustness of the laboratory testing and plume modelling.

Rebuttal of TTR's evidence

- (h) The Fisheries Submitters' evidence indicates that there has been a lack of investigation by the Applicant into the composition and deposition of the sediment that may result in the plume travelling much greater distances with consequent adverse effects on the marine environment and fisheries.

- (i) Good baseline data is fundamental in conducting an impact assessment to determine whether or not there is sufficient certainty as to the impacts of a proposed development and whether they are acceptable. Baseline monitoring should have been undertaken and presented as part of this application. The Applicant should not be able to obtain this information after consent has been granted as a condition of consent.
- (j) There is no meaningful way in these circumstances to ensure that appropriate triggers are in place to deal with unforeseen impacts or changes to the receiving environment that might occur as a result of the proposal. Baseline information must be adequate enough to enable any changes to the receiving environment (i.e. uncertain impacts) to be monitored and appropriate environmental triggers to be established. This is the rationale and policy behind taking an adaptive management approach.
- (k) The Applicant's consideration of the existing commercial fishing and aquaculture rights, which are lawfully-established existing interests recognised under the EEZ Act, has significant gaps and is inadequate.

Conclusion

- (l) The Applicant's current application is similar to its 2013 application which was declined by the Decision Making Committee at that time. Although the Applicant has undertaken additional laboratory testing, plume modelling and finalised environmental management plans and proposed conditions, there is still uncertainty as to the potential impacts of the proposal on the receiving environment and existing fishing interests.
- (m) I do not consider that the Applicant has sufficient baseline information about the receiving environment or existing fishing activities to enable potential changes resulting from the proposal to be appropriately monitored or addressed through adaptive management environmental triggers (i.e. conditions of consent).

INTRODUCTION

Qualifications and Experience

3. My name is Helen Margaret Anderson. I hold a Bachelor of Planning and Master of Planning (with Honours) from the University of Auckland.
4. I am a full member of the New Zealand Planning Institute and I have more than 23 years' experience in resource management planning, both in local government and as a planning consultant.
5. I am a Principal Planner at Jacobs in Wellington. I have been working for Jacobs since June 2016.
6. Prior to joining Jacobs I worked for AECOM New Zealand Limited (formerly URS New Zealand Limited) as a planning consultant for over fifteen years. Before joining AECOM I worked for Auckland City Council for over six years as a planner in the Hobson Eastern Bays Area Office and then for City Environments, Auckland City Council's regulatory unit. I held various planning and team management roles in the organisation.
7. I have expertise in both environmental and statutory planning. I specialise in providing resource management advice to both public and private sector clients across a range of projects around New Zealand, predominantly under the requirements of the Resource Management Act 1991. I am, however, familiar with the requirements of the EEZ Act including its purpose (including sustainable management), reliance on information principles, and adaptive management in the face of uncertain information.

Code of Conduct

8. I have read the Environment Court Code of Conduct for expert witnesses and agree to comply with it.
9. I confirm that the topics and opinions addressed in this statement are within my area of expertise except where I state that I have relied on the evidence of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

Background to Evidence Preparation

10. I have been retained by Fisheries Inshore New Zealand Limited (**FINZ**), The New Zealand Federation of Commercial Fishermen Inc, Talley's Group Limited, Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited (collectively the **Fisheries Submitters**) to prepare a statement of evidence (amongst other things) on the: (a) adequacy of the statutory section of the Impact Assessment and planning evidence supplied; (b) proposed approach to adaptive management; and (c) proposed consent conditions.
11. I am familiar with the general site of the application and surrounding environment, but have not visited the coastal area or been at sea in the area.
12. In preparing this evidence I have read the following documents:
 - (a) TTR – South Taranaki Bight Offshore Iron Sand Extraction and Processing Project, Impact Assessment, dated August 2016 (**TTR Impact Assessment**);
 - (b) Corporate Evidence of Shawn Thompson on behalf of TTR, First Statement - Project Description, dated 16 December 2016;
 - (c) Corporate Evidence of Shawn Thompson on behalf of TTR, Second Statement - Operational Description, dated 16 December 2016;
 - (d) Expert Evidence of Dr Philip Mitchell on behalf of TTR, Planning and Conditions, dated 19 December 2016;
 - (e) Expert Evidence of Mr Daniel Govier on behalf of TTR, Monitoring of effects and management plans, dated 15 December 2016;
 - (f) Primary expert evidence of Dr Gregory Barbara on marine ecology for the Fisheries Submitters, dated 23 January 2017;
 - (g) Primary expert evidence of Mr Joris Jorissen on laboratory testing and plume modelling for the Fisheries Submitters, dated 23 January 2017;s
 - (h) Primary expert evidence of Mr Derek Todd on coastal processes for the Fisheries Submitters, dated 23 January 2017;

- (i) Primary expert evidence of Mr Bruce Clarke on environmental risk for the Fisheries Submitters, dated 23 January 2017;
 - (j) Primary expert evidence of Dr Jeremy Helson and Mr Andrew Smith on fisheries management for the Fisheries Submitters respectively dated 23 January 2017 and 23 January 2017; and
 - (k) The primary evidence of Mr Doug Loder and Mr Anthony Piper for the Fisheries Submitters, both in draft form at the time of completing this statement.
13. I rely on the expert evidence of **Dr Greg Barbara, Mr Joris Jorissen** and **Mr Derek Todd** for the Fisheries Submitters in respect of the adequacy of the technical reports prepared by TTR, particularly in relation to the biophysical effects of the sediment plume, the robustness of the laboratory testing and plume modelling and effects on coastal processes.
14. I rely on the expert evidence of **Mr Bruce Clarke** for the Fisheries Submitters in respect of the technical aspects of the risk management approach proposed by TTR. I note, however, that as an environmental and statutory planner I have the planning expertise to provide views on such things.
15. I rely on the expert evidence of **Dr Jeremy Helson** and **Mr Andrew Smith** for the Fisheries Submitters in relation to fisheries management.
16. I note in respect of paragraphs [13], [14] and [15] that as an environmental and statutory planner I have planning expertise to assess those experts' evidence in terms of the statutory regime of the EEZ Act and environmental policy, including such things as impact assessment, uncertainty, baseline information, precaution, adaptive management and sustainable management.

SUSTAINABLE MANAGEMENT AND UNCERTAIN OR INADEQUATE INFORMATION

17. The purpose of the EEZ Act is to promote the sustainable management of the “natural resources” of the exclusive economic zone and the continental shelf (s 10(1)(a)).
18. Sustainable management is defined under s 10 of the EEZ Act as:
 - ... managing the use, development, and protection of natural resources in a way, or at a rate, that enables people to provide for their economic well-being while -
 - (a) Sustaining the potential of natural resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
 - (b) Safeguarding the life-supporting capacity of the environment; and
 - (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.
19. In order to achieve the purpose of the Act decision-makers must “*apply the information principles to the ... consideration of applications for marine consent*” (s 10(3)(b)).
20. The Act’s information principles require that the EPA must (s 61(1)):
 - (a) make full use of its powers to request information from the applicant, obtain advice, and commission a review or a report;
 - (b) base decisions on the best available information; and
 - (c) take into account any uncertainty or inadequacy in the information available.

21. The EPA must “*favour caution and environmental protection*” where the information available is uncertain or inadequate (s.61(2)). The DMC found in the TTR decision of 2014 that:¹

Section 61(2) contains an important direction. We must “*favour caution and environmental protection*” where the information is uncertain or inadequate. This provision is an explicit statement that, within the context of the EEZ Act, the promotion of sustainable management requires a cautious approach. The taking of risks in this environment is not encouraged, and we note that that this direction is not to be traded off against the attainment of economic well-being. In other words, the requirement to favour caution and environmental protection in the face of uncertain or inadequate information is an absolute one, and we remind ourselves of section 10(3), which makes it clear that applying the information principles in section 61 is one of the ways the purpose of the EEZ Act is achieved.

22. Makgill and Gardiner-Hopkins state in relation to the above finding that:²

In simple terms, the DMC found that the requirement to favour caution and environmental protection in circumstances of uncertain or inadequate information is unqualified. It did not consider that there is any discretion to depart from it, or weigh it against other competing factors such as the economic benefits of allowing a proposal to proceed.

23. If favouring caution and environmental protection means an application for consent is likely to be refused, the EPA must first consider whether an adaptive management approach would allow the activity to be undertaken (s 61(3)). The EPA may provide for an adaptive management approach through the imposition of marine consent conditions.³

¹ Trans-Tasman Resources Ltd Marine Consent Decision, Environmental Protection Authority, dated 17 June 2014, at paragraph [139].

² Makgill, R. and Gardiner-Hopkins, J., “The Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012” in Blakeley S (ed.), *DSL Environmental Handbook*, online and loose-leaf editions (Brookers Ltd, Wellington 13/4/16), chapter 9A EX12, at page 9A-25.

³ *Ibid*, chapter 9A EX1301, at page 9A-25.

24. I have been advised by counsel for the Fisheries Submitters that the Supreme Court, in its decision of *Sustain our Sounds v New Zealand King Salmon* [2014] NZSC 40, sets out four tests for assessing the appropriateness of a proposed adaptive management regime. These are set out at paragraph [133] of the Supreme Court's decision as follows:
- (a) there will be good baseline information about the receiving environment;
 - (b) the proposed conditions provide for effective monitoring of adverse effects using appropriate indicators;
 - (c) thresholds are set to trigger remedial action before the effects become overly damaging; and
 - (d) effects that might arise can be remedied before they become irreversible.
25. I note that the very first step is to ensure that there is sufficient baseline information about the receiving environment. I agree with the expert evidence of Mr Bruce Clarke at paragraphs [20] and [23] that this is consistent with environmental good practice which requires that environmental baseline information is completed to a level which allows the environmental effects from the development on the receiving environment to be adequately determined and whether additional mitigation is required to reduce effects to acceptable levels as part of the assessment process and prior to any application for consent. Baseline information must be adequate enough in these circumstances to enable any changes to the receiving environment (i.e. uncertain impacts) to be monitored and appropriate environmental triggers to be established.
26. Baseline information must be based on real data concerning the environment in which an activity is proposed. It cannot rely on modelled information. The usefulness of models is limited to predicting potential environmental impacts based on the quantity and quality of information of baseline information that is available.

IMPACT ASSESSMENT

Statutory Assessment of the Proposal under the EEZ Act

27. The Applicant has presented an assessment of the proposal's marine consent requirements under the EEZ Act in the Impact Assessment (IA) at Table 1.2 and Table 1.3 which outlines the Marine Discharge Consent Requirement under Regulation 10 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects – Discharge and Dumping) Regulations 2015 (**EEZ Regulations 2015**). The overall activity status under section 36 of the EEZ Act for the activities for which consent is sought is discretionary.
28. I have reviewed the Applicant's activity description and the EEZ Act requirements and I concur with the marine consent requirements identified in the IA.
29. The IA⁴ also identifies that there are a range of activities that are to be conducted by the project, which are not regulated by the EEZ Act or by any of the EEZ Regulations. For example, discharges to air, discharge of de-salinated and/or re-salinated water etc. The Applicant describes these activities in the IA as they are considered relevant to understanding all the environmental effects that the activity may generate and how they are to be addressed. Section 59(2)(b)(i) of the EEZ Act requires the decision-maker to take into consideration "*the effects of activities that are not regulated under this Act*".
30. I agree with the Applicant's approach of identifying all activities in the IA in order to provide a comprehensive understanding of the potential environmental effects of the proposal, regardless of whether or not a marine consent or marine discharge consent is required.

Terminology used in the IA and Technical Reports

31. As noted in **Mr Clarke's** evidence,⁵ the IA and some of the technical reports are not consistent in terms of input data, activities analysed and terminologies used and, as such, it is difficult to determine the actual level of effects of the

⁴ TTR Impact Assessment, pages 10-11.

⁵ Primary statement of evidence of Bruce Clarke for Fisheries Submitters dated 23 January 2017, at paragraph [30(a)].

proposed mining operations. I support the assessment by **Mr Clarke** and consider that it is very important that information between reports is consistent, otherwise it is difficult for the reader to determine what is being assessed and whether the effects predicted actually relate to the process described in the IA.

PROPOSED CONSENT CONDITIONS

Proposed Condition 14 - Baseline Environmental Monitoring

32. A proposed set of consent conditions has been provided by TTR in Attachment 1 of the IA. Fundamental to TTR's project is the proposal to undertake a minimum of two years of baseline environmental monitoring as set out under a Baseline Environmental Monitoring Plan (**BEMP**) under proposed conditions 14 to 17. The primary purpose of the BEMP is to confirm the following conclusions reached by TTR's technical specialists being:⁶
- (a) that the adverse effects of the sediment plume are not significant, especially when considered against the naturally occurring background sediments present in the environment;
 - (b) that effects on primary production, fish, seabirds and marine mammals will be localised;
 - (c) that following mining and re-deposition of de-ored sediments the environment will return to normal very quickly, and
 - (d) to implement a range of pre-mining and post mining environmental monitoring.
33. As set out in proposed condition 14, I understand that the environmental monitoring undertaken under the BEMP will provide data to verify the background data used in the Operational Sediment Plume Model and to verify whether the "Response Limit" and "Compliance Limit" values in Schedule 2 are appropriate following validation of the Operational Sediment Plume Model.

⁶ Statement of evidence of Dr Philip Mitchell for TTR dated 19 December 2016, at paragraph [52].

34. **Mr Clarke's** evidence raises the question as to why a BEMP is required for further baseline sampling to be conducted prior to mining operations commencing. Under good international impact assessment practices the collection of baseline data, adequate to confidently determine impacts of the proposed development as part of the assessment process is normally undertaken as part of the impact assessment process prior to consents being granted.
35. FINZ in its submission has also raised concerns regarding: (a) the robustness of the proposed response and compliance limits and the extent of baseline data that the Applicant is reliant on; and (b) the apparent need for two years more baseline monitoring to verify assessments and trigger limits when the DMC was so critical of the lack of baseline data in the first application.
36. I consider that this is particularly important given that TTR's previous application was refused (pursuant to section 69 of the EEZ Act) by the appointed DMC⁷ on the basis that the DMC considered the previous application was not sufficiently robust in respect of a number of matters. These included the:
- (a) Effects of the proposal resulting from the sediment plume resulting from the deposition of de-ored sediment. The sediment plume was estimated to have a median extent of approximately 50 kilometres long and up to 20 kilometres wide, predominantly east south-east from the mining site; and
 - (b) Significant impacts of the plume on primary productivity.
37. The DMC went on to conclude that:⁸

In summary, on the evidence presented, we are not satisfied that the life-supporting capacity of the environment would be safeguarded or that the adverse effects of the proposal could be avoided, remedied or mitigated (Section 10(2)(b) and (c) of the EEZ Act), nor do we consider that the proposed conditions (including the adaptive management approach) are sufficiently certain or robust for this application to be approved, given the

⁷ Trans-Tasman Resources Ltd Marine Consent Decision, Environmental Protection Authority, dated 17 June 2014.

⁸ Trans-Tasman Resources Ltd Marine Consent Decision, Environmental Protection Authority, dated 17 June 2014, at paragraphs [14] and [15].

uncertainty and inadequacy of the information presented to us about the potential adverse effects.

Overall, we think this application was premature. More time to have better understood the proposed operation and the receiving environment and engage more constructively with existing interests and other parties may have overcome many of the concerns we have set out in this decision. It is conceivable that at least some of these matters could have been addressed contemporaneously with the other investigative work the applicant undertook prior to lodging the application for consents. Ultimately, the information upon which we had to make our decision, while voluminous, was too uncertain and inadequate, and we did not have sufficient confidence in the adaptive management approach proposed to address that uncertainty and inadequacy to enable the activity to be undertaken. For all of these reasons, the application as presented to us does not meet the sustainable management purpose of the EEZ Act.

38. While TTR is now proposing quantitative triggers for suspended sediment concentrations in Schedule 2, developed based on modelling undertaken to date, the question is whether there remains a high level of uncertainty in relation to the potential environmental effects of the activity.
39. I concur with the evidence of **Mr Clarke** and question why the baseline monitoring has not already been conducted. My reasons for this are the need under TTR's application:
 - (a) For at least a further two years of baseline environmental monitoring in order to more fully understand the effects of the activity and to confirm the conclusions reached by TTR's technical specialists;
 - (b) To provide data to verify the background data used in the Operational Sediment Plume Model; and
 - (c) To verify the "Response Limit" and "Compliance limit" values in Schedule 2.
40. Having the results of this monitoring now would provide more certainty to submitters as to the nature and extent of the environmental effects of the mining operation, and if the results were presented as part of the IA, may provide more certainty to interested and potentially affected parties.

Proposed Condition 14 - BEMP Monitoring Parameters

41. TTR's proposed Condition 14 states:

Prior to the commencement of any iron sand extraction activities, the Consent Holder shall ensure that a minimum of two (2) years of baseline monitoring has been undertaken and shall, as a minimum, include monitoring of:

- Suspended sediment concentrations;
- Sediment quality;
- Subtidal and intertidal biology;
- Optical water quality;
- Physio-chemical parameters;
- Seafood resources;
- Marine mammals;
- Underwater noise;
- Seabirds;
- Commercial fishing; and
- Recreational fishing.

42. However, as identified in **Dr Barbara's** evidence at paragraph [44], where he comments on the expert evidence of Mr Daniel Govier, the physio-chemical parameters, sediment quality and commercial fishing appear to have been omitted from the monitoring program as outlined in Appendix 1. There are also no specific quantitative compliance limits for water quality other than for Suspended Sediment Concentrations (**SSC**). Appendix 1 also does not specifically state testing of water or sediments for contaminants or which suite of contaminants will be screened for. Dr Barbara at paragraph [47] of his evidence suggests that Arsenic and other toxicants in both water and sediment should be screened for, in order to determine if sand mining is having any influence on ambient concentrations in the proposed project area (**PPA**) and surrounding areas.

43. I consider that if the consents are granted, these items should be included in the list of matters to monitor under the BEMP.

Proposed Condition 28 - Technical Review Group

44. Under proposed Condition 28 the Technical Review Group (**TRG**) shall:
- ... as a minimum, consist of one suitably qualified and experienced representative chosen by each of the following parties:
- The Consent Holder;
 - Taranaki Regional Council;
 - Fisheries Inshore New Zealand;
 - The Kaitiakitanga Reference Group (Condition 34);
 - Te Tai Hauauro Regional Fishing Forum; and
 - DOC
45. However, in Mr Daniel Govier's expert witness statement in which he overviews the BEMP and Environmental Monitoring and Management Plan (**EMMP**) requirements, it is noted at paragraph [151] that Sanford Ltd has replaced Fisheries Inshore New Zealand Limited (**FINZ**). While Sanford Ltd is a member of FINZ, it is only one company within the organisation and unless mandated by FINZ, it does not have authority to make decisions on behalf of the inshore commercial fishing sector.
46. Sanford Ltd is also a supporter of TTR (refer Shawn Thompson "Project Description" witness statement at paragraph [40(d)]) and therefore does not represent the larger number of inshore fishers who I understand voted in favour of FINZ opposing TTR's application on the basis of the information that had been made available to them at that time. I understand Sanford Limited voted against FINZ opposing TTR's application.
47. Additionally, under proposed Condition 5(d), the TRG is provided ten (10) working days to provide any response on investigation results where a breach of a "Response Limit" identified in Schedule 2 occurs. In my opinion this represents a fairly short timeframe for the TRG to respond, and a longer time frame may be more appropriate. A similar timeframe applies for the TRG to

review investigation into “Compliance Limit” breaches under Condition 6(b) which I also consider to be inadequate.

Proposed Condition 8 - Spill Contingency Management Plan

48. Proposed Condition 8 establishes the requirement to prepare a Spill Contingency Management Plan (**SCMP**). However, the proposed condition does not state the process for certification of the SCMP. Additionally, the SCMP condition in the fourth paragraph requires protocols, methods and responses to be implemented following an unplanned discharge “*to the greatest extent possible*”. In my opinion this leaves too much discretion to TTR and its agents within the proposed condition and should be deleted.

Proposed Condition 9 - Fishing Industry Meetings

49. Proposed Condition 9 establishes the requirement for the Consent Holder to provide for six (6) monthly meetings (i.e. a meeting every six months) between itself and representatives of the commercial fishing industry nominated by FINZ.
50. While this proposed condition is welcomed by the Fisheries Submitters, the FINZ submission identified that a clearer framework of obligations and undertakings associated with the Fishing Industry Meetings is needed. I also note that it seems strange that TTR would defer to FINZ on this matter, but replace FINZ with Sanford Ltd under proposed condition 28.
51. Proposed Condition 9 requires that “*the first meeting shall occur no later than six (6) months prior to the commencement of the iron sands extraction activities*” which means that the meetings will potentially continue for only two years in to the mining period. I consider that it is important for meetings to continue for a longer period after the mining activity commences, to ensure that the approaches and communication protocols established between TTR and the commercial fishing industry are adequate.

Proposed Condition 17 – Process to Review and Amendment of Response and Compliance Limits

52. Proposed Condition 17 establishes the process for determining updated numerical values of the “Response Limits” and “Compliance Limits” in Schedule 2 utilising the methodology specified in Schedule 3. The condition

states that any change to the numerical values shall not require a change to consent conditions, but will be identified as part of the EMMP required under proposed condition 21.

53. I note that proposed condition 21(d) refers to any *“Memorandum of Certification issued by the EPA certifying a change to a limit in Schedule 2”*.
54. The proposed conditions as worded enable a process to change trigger limits with no input from stakeholders or a formal change of conditions process. It would in my opinion, be appropriate for stakeholders to have input into this process through a formal change of conditions process because the SSC response and compliance limits are key in controlling the effects of the proposal and ensuring compliance.

Proposed Condition 24 – Post-Extraction Monitoring

55. Proposed condition 24 provides a process for post-extraction monitoring of the biological environment within the consent area for a period of four years, by way of a Post-Extraction Monitoring Plan.
56. Proposed condition 25 provides for an annual post-extraction report, which requires information on *“(d) Any remediation undertaken and the results of such remediation”*.
57. While I support the proposed post-extraction monitoring, it is of concern that the consent conditions do not specifically address what happens if monitoring shows that the biological environment is not recovering, even with remediation measures undertaken. I consider that it would be appropriate for a sufficient bond to be paid by TTR to the Environmental Protection Authority to ensure actions can be funded if the consent holder does not meet the condition obligations.

Proposed Condition 55 – Deposition of Material on the Seabed

58. Proposed condition 55 deals with the deposition of materials on the seabed, which states that discharge of de-ored sediment is to be *“at a nominal distance of four (4) m above the seabed”*. It is unclear whether this reference to the “seabed” refers to the pre-extraction bed level, or is the new seabed level within the extraction lane or includes both scenarios. Figure 2.8 on page 25 of the IA appears to indicate that it is the post-extraction seabed level that the

distance is taken from. If it is the pre-extraction seabed level, discharge would not necessarily have to be directed into the extraction lane, thereby potentially increasing sediment plumes and discharge away from the extraction area.

59. I consider that this condition requires amendment to specify that the distance requirement applies from the post-extraction seabed level within the extraction pit, as it is the discharge of de-ored sediments that will be the main source for release of fine sediments into the water column. As discussed in the evidence of **Mr Jorissen** at paragraph [31], it is the trapping capacity of the pit which will determine the proportion of fine sediments escaping the pit and hence the amount of fine sediment entering the water column.

FISHERIES SUBMITTERS' CONCERNS

60. The Fisheries Submitters are represented by witnesses from Fisheries Inshore New Zealand Limited (FINZ), Talley's Group Limited (**TGL**), Cloudy Bay Clams, Southern Inshore Fisheries Management Company Limited and the New Zealand Federation of Commercial Fisherman Inc (**NZFCF**).⁹ Representatives from these organisations have prepared evidence outlining their concerns with the TTR seabed mining proposal. I address these concerns where applicable with the findings of the Fisheries Submitters' expert witnesses (i.e. including the expert evidence of Dr Helson and Mr Smith, who are employed by Fisheries Submitters' entities).
61. The concerns of Fisheries Submitters are summarised as follows.

⁹ Primary statements of expert fisheries management evidence for Fisheries Submitters of Dr Jeremy Helson dated 23 January 2017 and Andrew Smith dated 23 January 2017; and the primary statements of evidence of Douglas Saunders-Loder and Anthony Piper both in draft form.

Potential Bio-Physical Effects on Existing Fishing Interests

62. Fisheries Submitters are concerned about the potential short and long term impacts of TTR's seabed mining activity on existing commercial fishing interests within FMA 8. In particular, the impact on pelagic and other fish species and their food sources resulting from changes in turbidity of the water, noise and light generated by the mining operation, increases in heavy metals in the water column and potential spatial displacement of quota and non-quota species from the significant volume of water and de-ored sediments that are being returned to the marine environment.
63. The expert evidence of **Dr Greg Barbara** at paragraph [29] questions the appropriateness of the applied noise levels for developing underwater noise modelling given the lack of direct measurements of equivalent crawler equipment to be used by TTR. **Dr Barbara** at paragraph [30] concludes that dredging is likely to be audible to most marine mammals up to several kilometres from the source. This may mean that the noise impact predictions on marine fauna may not be appropriate.
64. **Dr Barbara** also notes at paragraph [33] that TTR's modelling of the sediment plume has been based on the assumption that the mined sands contain less than 4% clay and silts. Should concentrations of clay and silts be greater than 4%, then Dr Barbara considers that the deposition of clays and silts is likely to travel further distances and these would therefore have greater impacts than the modelled sand deposition. Given that sand extraction is proposed to a depth of 11 metres below the seabed, defining the spatial distribution, depth and thickness of the mud layer is important, from both an operational and environmental perspective. **Dr Barbara**, at paragraph [36] of his expert evidence considers that the number of cores used to describe the mud layer (two, with a third unreported) is inadequate to give sufficiently detailed description of the distribution of the mud layer throughout the project area.
65. **Dr Barbara** at paragraphs [66] to [85] of his expert evidence considers interactions with fisheries. Given little is known about the foodweb of the South Taranaki Bight (**STB**) and the importance of specific habitats, **Dr Barbara** considers that further investigation is required of the noted gap between the fisheries productivity and apparent depauperate benthic fauna.

66. **Dr Barbara** concludes that without a better understanding of the extent of overlap with the PPA, plume impacts and high return fishing areas, it is not possible to state that the spatial displacement of the PPA would be minor or not. He goes on to state at paragraph [85] that:

Each of these factors when considered alone: benthic habitat loss, sediment quality and benthic morphology changes, water quality changes, SSC, underwater noise, nutrient enrichment, biofouling and night time lighting are not enough to significantly change the distribution of fisheries species across the region. However, the cumulative effect of all of these would be enough to change the distribution of some species. The extent of these changes in distribution is difficult to predict without ecosystem modelling for fish distributions that includes the effects of all of these parameters in the STB.

Potential Effects on Management of Existing Fishing Interests

67. I agree with **Dr Jeremy Helson** at paragraph [48] that TTR's analysis of the potential impact of the proposal on commercial fishing is overly simplistic and that this is not solely a scientific matter, but one that requires an understanding of fisheries management and the potential impacts of the proposal on fisheries management. These matters include:
- (a) The lack of incorporation of TTR's mining operation on to any fisheries management planning and the impacts of the activity from a fisheries management context, e.g. a change in distribution may make catching fish species economically unviable if catching costs increase due to greater dispersion, or greater distance from port;
 - (b) The potential impact of any sediment plume on aquaculture facilities in the top of the South Island;
 - (c) Reputational risk to New Zealand fisheries through potential impacts on fish quality caused by increased sediment loads and heavy metal contamination; and
 - (d) The lack of consultation with commercial fisheries interests.

Potential Effects of Changes to the Seabed on Existing Trawling Activities

68. The Fisheries Submitters are concerned that changes to the seabed profile resulting from the pits and mounds created by TTR's mining activities risk adversely affect trawling activities.
69. **Mr Andrew Smith** states at paragraphs [47] to [49] of his expert fisheries management evidence that the pits and mounds pose a risk to operational trawling, including increased risks to health and safety of fishermen and their crew and financial loss if trawl vessel fishing gear should become stuck on a sediment mound. Mr Smith is also concerned at the extent of the pits and mounds that will be left post sediment re-deposition, and how long the pits would take to in fill and mounds to subside. Estimated timeframes of 83 years for pits to in fill and 148 years for mounds to subside means that there are going to be significant hazards to existing trawling activities over a period of time.
70. **Mr Derek Todd** considers at paragraphs [25] and [26] that the annual bathymetric survey information should be made available to commercial fishing interests so that fishing vessels are aware of the location of mounds and can plan to avoid them when trawling.
71. I agree with Mr Todd that there needs to be a better procedure in place to provide this information to the commercial fishing interests. I consider that how this information is provided to these commercial fishing interests is a process which should be determined and agreed through the Fishing Industry Meetings required under proposed condition 9.

Potential Effects on Existing Surf Clam Fishery

72. The sediment plume generated by TTR's mining operation poses unique risks to the surf clam fishery in FMA 8. Surf clams are very sensitive to environmental change and fine sediment plumes may suffocate these bi-valves and potentially affect food sources of the clams. I refer to the evidence of Anthony Piper relating to the lack of discussion as to potential effects on Surf Clams in TTR's evidence. Surf Clams can use their siphons to exclude suspended sands, but may not be able to cope with extreme fines in significant volumes.

73. The evidence of **Dr Barbara** notes at paragraph [40], that the evidence of Dr Mark James¹⁰ advises that thin films of clay of as little as 2mm can prevent settlement and recruitment of macroalgal species known to occur on reef areas of the STB. It is Dr Barbara's opinion that clay and silts would travel much greater distances than 5 km and remain in suspension far longer than the modelled SSC and therefore pose a threat to macroalgal reefs outside the PPA in the wider STB.
74. **Dr Barbara** states at paragraph [40] that if mud deposition or clay exceeds 4 cm in areas, fisheries species, such as surf clams, would suffer. Anthony Piper states his concerns in his draft evidence that this type of deposition would smother the clams and potentially destroy the fishery in that area.

Biosecurity Issues

75. There is the potential for the introduction into New Zealand waters of foreign contaminants, marine organisms and poisons into the mining area from foreign vessels.
76. **Dr Barbara** at paragraphs [58] to [65] addresses the issue of the potential for TTR's mining operation to introduce non-indigenous or invasive marine species, in particular harmful algal species or their cysts through ballast water or mining operations.
77. **Dr Barbara** notes that the evidence of Forrest¹¹ states that it would be almost impossible to contain toxic algal blooms. **Dr Barbara's** concern is that the TTR mining operation will potentially provide localised nutrient enrichment and settlement locations along vessel hulls and mining infrastructure that would not normally be available in Open Ocean or exposed environments.

¹⁰ Expert Evidence of Mark James for TTR – Overall ecological effects, dated 15 December 2016.

¹¹ Expert Evidence of Barrie Forrest for TTR – Biosecurity, dated 15 December 2016.

Consultation

78. TTR has undertaken consultation with Sanford Limited, as outlined at section 6.3.13 of the Impact Assessment and the evidence of Mr Shawn Thompson.¹² However, as outlined in evidence by Fisheries Submitters,¹³ it is considered that the level of consultation undertaken with the wider commercial fishing industry has been inadequate.
79. The evidence of Shawn Thompson¹⁴ strongly refutes that TTR's consultation with Fisheries Submitters has been inadequate. However, fisheries expert Andrew Smith and fisheries witness Ant Piper (of Cloudy Bay Clams Limited) give evidence that no consultation has been undertaken directly with them, even though they both presented evidence at the 2014 hearing. Additionally, as outlined in Dr Helson's evidence,¹⁵ FINZ reserved its position until the industry could assess the second proposal (the current application dated 23rd of August 2016) based on the application proper.

REBUTTAL OF TTR'S EVIDENCE

Expert Evidence of Dr Philip Mitchell - Planning and Conditions

80. The evidence provided by Dr Philip Mitchell concludes in the Executive Summary that:¹⁶

... while all aspects of the project have been assessed, the expert assessments have confirmed that the environmental effects of this project essentially relate to one of two aspects, these being:

- (a) The physical disturbance of the seabed sediment and the consequential effects on the benthic organisms that inhabit them; and

¹² Evidence of Mr Shawn Thompson for TTR – Project Description, dated 16 December, pg.12 paragraph [40(d)]

¹³ Primary statements of expert fisheries management evidence for Fisheries Submitters of Andrew Smith dated 23 January 2017 at paragraph [56]; and the primary statements of evidence of Doug Saunders-Loder and Ant Piper both in draft form

¹⁴ Evidence of Mr Shawn Thompson for TTR – Project Description, dated 16 December, paragraphs [86] to [89].

¹⁵ Primary statement of evidence Dr Helson for Fisheries Submitters, dated 24 January 2017, paragraphs [93] to [98].

¹⁶ Expert Evidence of Dr Philip Mitchell for TTR dated 19 December, at paragraph [4] and [4 Executive Summary]

(b) The sediment plume.

81. Dr Mitchell's overall conclusion is that:¹⁷ *"beyond the source of the extraction area any effects will be difficult to distinguish from the naturally occurring background environment and, where experienced, can be adequately addressed through consent conditions."*
82. Dr Mitchell goes on to state in paragraph [33] of his evidence that *"the sediment plume, particularly its scale and extent (including how it changes over time), is at the heart of this hearing and virtually all of the effects of the proposal are as a result of the sediment plume."*
83. **Mr Jorissen** has reviewed the expert evidence of Dr Dearnaley¹⁸, and the technical reports prepared by HR Wallingford¹⁹ and NIWA²⁰ which address laboratory testing of the sediment, source terms and sediment properties and sediment plume modelling.
84. **Mr Jorissen** concludes at paragraphs [37] to [40] of his evidence that while the overall strategy and approach adopted is considered appropriate and the laboratory tests carried out by HR Wallingford are comprehensive and thorough, he has the following concerns:
- (a) The interpretation in terms of proportioning the sediment between the four nominated settling fractions, as documented in NIWA (2015a), is considered more appropriate than that proposed by HR Wallingford (2014). Adopting the NIWA interpretation could result in a larger sediment plume than reported.
85. The suspended fine sediments resulting from the mining operations are input into the dispersion model as a temporally constant point source load, representing the average rate of discharge during the mining operations. Application of a temporally constant rate that represents the average rate of

¹⁷ Expert Evidence of Dr Philip Mitchell for TTR dated 19 December, at [5 Executive Summary]

¹⁸ Expert evidence of Dr Michael Dearnaley for TTR dated 15 December 2016.

¹⁹ HR Wallingford (2014), Support to Trans-Tasman Resources: Laboratory testing of sediment, DDM7316-RT002-R01-00, October 2014 and HR Wallingford (2015), Support to Trans-Tasman Resources Source terms and sediment properties for plume dispersion modelling, DDM7316-RT004-R01-00, October 2015.

²⁰ NIWA (2015a), Memorandum - Contribution to source terms report for TTR, M. Pinkerton, NIWA, 4 September 2015 and NIWA (2015b), South Taranaki Bight Iron Sand Extraction Sediment Plume Modelling, NIWA Report WLG2015-22, NIWA, October 2015.

release will underestimate the release of fine sediments during certain mining operations, material compositions or mining pit configurations, and overestimate during other periods. As a consequence, the plume model could underestimate the temporal variability in the sediment plume characteristics, which could mean that the plume model predictions understate the impacts for less frequent occurrences

86. The expert evidence of **Dr Barbara** notes at paragraph [39] that there is uncertainty regarding the Particle Size Distribution percentages of fines demonstrating that there is potentially considerable underestimate of the mud content. Dr Barbara concludes at paragraph [42] that without modelling the fines it is difficult to know the full extent of a plume, but it would be expected to be larger than the current TTR sediment plume.
87. Given the project proposes a two-year period of environmental baseline monitoring prior to iron sand mining commencing, to determine the baseline environment, I question whether Dr Mitchell can make such a broad statement as quoted in paragraph [81] above given that there remains a considerable level of uncertainty as established in the evidence of **Dr Barbara** and **Mr Jorissen**.
88. As identified in **Mr Clarke's** evidence at paragraphs [20] and [21], baseline sampling to determine natural baseline conditions of the receiving environment is normally carried out prior to any application for consent. It is good practice for baseline sampling to be completed to a level which allows the environmental effects from the development on the receiving environment to be adequately determined and whether additional mitigation required to reduce effects to acceptable levels as part of the assessment process and prior to any application for consent. Good baseline data is fundamental in conducting an impact assessment and is a key cornerstone in determining whether or not the impacts of a proposed development are acceptable.
89. As stated by **Mr Clarke** at paragraph [23], good baseline data is also fundamental to addressing the potential impacts of a proposal where the information concerning potential impacts is uncertain or may change over time. Baseline information must be adequate enough in these circumstances to enable any changes to the receiving environment (i.e. uncertain impacts)

to be monitored and appropriate environmental triggers to be established. This is the rationale and policy behind taking an adaptive management approach.

90. I concur with **Mr Clarke's** observations and consider that baseline monitoring should have been undertaken and presented as part of this application. The Applicant should not be able to obtain this information after consent has been granted as a condition of consent. There is no meaningful way in these circumstances to ensure that appropriate triggers are in place to deal with unforeseen impacts or changes to the receiving environment that might occur as a result of the proposal.

Existing Interests

91. Under section 60 of the EEZ Act an applicant is required to consider the effects on existing interests. Existing commercial fishing and aquaculture rights are lawfully-established existing interests recognised in the EEZ Act and must be taken into account when determining whether a consent should be granted (Section 59(2)(a)).
92. Dr Mitchell at paragraph [53] of his expert evidence considers that the design of the project has taken into consideration the existing interests of the project area and neighbouring STB area and has incorporated procedures to ensure that any effects on these interests will be avoided, remedied or mitigated.
93. In my opinion, however, there are significant gaps and inadequacies in the application and evidence supplied by the Applicant, as outlined by the Fisheries Submitters' experts, and as such the DMC must proceed with caution as required by Section 61(2) of the EEZ Act.
94. In light of the evidence presented by Fisheries Submitters, I do not consider that TTR has enough information about the receiving environment or fisheries management to adequately assess the potential impacts of the proposal on existing fishing interests. Furthermore, TTR has not in my opinion provided sufficient baseline information against which to measure changes in the environment meaning there is insufficient information available to take an adaptive management approach.

CONCLUSION

95. TTR's marine consent application to mine iron sand is in the same area of the STB at the same rate and uses broadly the same methods as were previously proposed in 2013 (and subsequently declined by the Decision Making Committee appointed to consider that application).
96. Since the EPA decision in 2014 TTR has undertaken additional laboratory testing (by HR Wallingford) and subsequent plume modelling. A key element of TTR's application has been the development and finalising of a detailed set of environmental management plans and proposed conditions which have been included in TTR's marine consent application.
97. The assumption that the proposed mining activity will have a negligible impact on commercial fishing is in large part based on TTR's assessment of the nature and extent of the sediment plume.
98. Having reviewed the IA and the evidence prepared for the Fisheries Submitters, I consider that there is uncertainty as to the potential impacts of the proposal on existing fishing interests. Furthermore, I do not consider that the Applicant has sufficient baseline information about the receiving environment or existing fishing activities to enable potential changes resulting from the proposal to be appropriately monitored or addressed through environmental triggers (i.e. conditions of consent). An adaptive management approach therefore cannot be taken, as is required under the EEZ Act in the face of the uncertain or unknown potential effects of the proposal. This leads me to conclude that the application should be declined.

Dated this 23rd day of January 2017



Helen Anderson