

**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 JEREMY GRAHAM HELSON
ON FISHERIES MANAGEMENT FOR THE FISHERIES SUBMITTERS**

Dated: 23rd January 2017

Counsel Acting

ROBERT MAKGILL
BARRISTER

Instructing Solicitor

PETER DAWSON
DAWSON & ASSOCIATES

P 03 544 1967 F 03 544 1968 E peter@maritimelaw.co.nz
PO Box 3830, Richmond 7050, New Zealand

TABLE OF CONTENTS

SUMMARY OF EVIDENCE	2
INTRODUCTION	5
Qualifications and Experience	5
Code of Conduct	5
Background to Evidence Preparation	6
NEW ZEALAND SEAFOOD INDUSTRY	8
FISHERIES INSHORE NEW ZEALAND LTD	9
Overview of Reasons for Opposing Application	10
The Quota Management System	12
Treaty Settlement	13
IMPACT ASSESSMENT ON FISHERIES INADEQUATE	14
Economic Analysis	17
Compounding Uncertainty	19
REPUTATIONAL RISK	21
Risk for New Zealand Seafood	21
Risk to New Zealand's International Reputation	22
CONSULTATION	24
CONCLUSION	26
ANNEXURE "A"	27

SUMMARY OF EVIDENCE

1. My name is Dr Jeremy Graham Helson and I am the Chief Executive of Fisheries Inshore New Zealand Limited.
2. I summarise my evidence, according to the key headings in this statement:

New Zealand Seafood Industry

- (a) The seafood industry is New Zealand's fifth biggest export earner and generates annual export revenues of c. \$1.38 billion from wild-capture fisheries. The total economic contribution of the fisheries sector of the industry was \$4.26 billion in 2015 with a GDP contribution of \$1.63 billion in the same period.
- (b) The fisheries sector of the New Zealand seafood industry employs about 13,700 people directly in fishing, seafood processing and related industries. Many of these jobs are in regional New Zealand.

Fisheries Inshore New Zealand Ltd

- (c) Fisheries Inshore New Zealand is a national organisation comprising 149 members with interests in 239 fish stocks. Collectively, members own more than 51% of the quota in 192 fish stocks and between 40 and 51% in a further 13 fish stocks.

Impact Assessment on Fisheries Inadequate

- (d) I consider Trans-Tasman Resources Limited's (**TTR** or **Applicant**) analysis of the impact of its proposal on commercial fishing to be simplistic and inadequate. The reports and evidence provided conflate the effects on fish species with the effects on fisheries.
- (e) The evidence consistently assesses biological impacts. While biological impacts are part of any analysis of the effects on fisheries, the analysis fails to appreciate that fisheries are an economic activity that is conducted subject to a complex legal regime.
- (f) Consequently, there is no adequate assessment of the effects of the proposed mining activity on existing commercial fishing interests. This

failure has resulted in the Applicant's economic analysis omitting an assessment of the economic impact on existing fishing interests. In place of such an analysis, the Applicant has provided an incomplete contextual description.

- (g) The uncertainty associated with the density and spatial extent of the sediment plume influences secondary effects such as light penetration and primary production; both of which are in turn uncertain.
- (h) The reductions of these important parameters are reported as averages over the Sediment Modelling Domain, an area of 13,300 km². There is no analysis of local-scale effects that may have a negative influence of commercial fish species and/or fisheries.

Reputational Risk

- (i) The New Zealand seafood industry has invested vast resources in demonstrating its sustainability credentials and enhancing the quality of our seafood to reach premium markets.
- (j) Clean water, sustainable harvest, world-leading management, the highest quality seafood, and a light environmental footprint are amongst important factors relied on to gain access into the most discerning seafood markets.
- (k) Large-scale seabed mining is not consistent with these attributes. I am concerned that the potential reputational damage arising from iron sand mining will have collateral negative economic consequences for the seafood industry.

Consultation

- (l) Fisheries Inshore New Zealand met on several occasions with representatives of TTR to understand the second Application and particularly how it differed from the original. Fisheries Inshore New Zealand did not discuss consultation in its submission of 12 December 2016.
- (m) At the aforementioned meetings Fisheries Inshore New Zealand was provided with summarised information that, while useful and

appreciated, was no substitute for the detailed reports and evidence we have now had the opportunity to consider. It was always our intention to consider the application carefully, including contracting the necessary expertise, once the detailed work had been made available.

Conclusion

- (n) I consider that the Applicant has not adequately understood or analysed the potential effects of its proposed mining operation on fisheries. Consequently, there is also no analysis of the economic impact of the mining operation on the existing interests of the commercial fishing sector.
- (o) Further, the effects of the sediment plume distribution are uncertain, and as a consequence the potential impacts on primary productivity and commercial fish species are also uncertain. The analyses provided do not consider these effects at a local scale, but averages results over a large area.

INTRODUCTION

Qualifications and Experience

3. My name is Dr Jeremy Graham Helson. I am the Chief Executive of Fisheries Inshore New Zealand Limited, a commercial fisheries organisation that works for the collective interests of commercial fishers and those that own quota for inshore and pelagic species.
4. I hold a Bachelor of Science with Honours (First Class), a Doctor of Philosophy in Marine Biology and a Bachelor of Laws. After gaining my PhD, I was a Japan Society for the Promotion of Science postdoctoral fellow at Tokyo University of Marine Science and Technology in 2002–2003.
5. Prior to working for Fisheries Inshore New Zealand, I spent 10 years in fisheries management at the Ministry for Primary Industries (and its predecessor organisations), most recently as the Manager of Deepwater Fisheries.
6. I have also worked as a lecturer in marine ecology at Victoria University of Wellington and as consultant marine biologist.

Code of Conduct

7. I have read the Environment Court Code of Conduct for expert witnesses and agree to comply with it.
8. 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.
9. I acknowledge that I have an interest in these proceedings given my position as CEO of Fisheries Inshore New Zealand Ltd. Nevertheless, I have endeavoured to prepare my evidence with the level objectivity required of me under the Code of Conduct for expert witnesses. I understand in this respect that the weight placed on my evidence depends on my ability to exercise objectivity in any views that I offer.

Background to Evidence Preparation

10. I am familiar with the general characteristics of the application site and surrounding environment. I am also familiar with the fisheries that exist in the vicinity of the application area.
11. In preparing this evidence I have read the following documents:
 - (a) TTR (2016) South Taranaki Bight Offshore Iron Sand Extraction and Processing Project Impact Assessment;
 - (b) TTR evidence: Project overview and consultation. Witness statement Shawn Thompson – First Statement Project Description, dated 16 December 2016;
 - (c) TTR evidence: Fish and commercial fishing. Expert witness statement Alison MacDiarmid – Marine effects and benthic ecology, dated 15 December 2016;
 - (d) TTR evidence: Ecology. Expert witness statement Lawrence Cahoon – Primary production and optical effects, dated 15 December 2016;
 - (e) TTR evidence: Ecology. Expert witness statement Mark James – Overall ecological effects, dated 15 December 2016;
 - (f) TTR evidence: Ecology. Expert witness statement Iain MacDonald – Existing environment, dated 17 December 2016;
 - (g) TTR evidence: Engagement and consultation. Witness statement Tokatumoana Kevin Walden, dated 16 December 2016;
 - (h) TTR evidence: Economic impacts. Expert witness statement Jason Leung-Wai, dated 15 December 2016;
 - (i) TTR evidence: Sediment plume. Expert witness statement Michael Dearnaley, dated 15 December 2016;
 - (j) NIWA (2015) Report 1 South Taranaki Bight Factual Baseline Environmental Report. NIWA Client Report No: WLG2011-43;

- (k) NIWA (2015) Report 2 Benthic habitats, macrobenthos and surficial sediments of the nearshore South Taranaki Bight NIWA. Client Report No: NEL2013-012;
- (l) NIWA (2015) Report 3 Benthic Flora and Fauna of the Patea Shoals Region, South Taranaki Bight. NIWA Client Report No: WLG2012-55;
- (m) NIWA (2015) Report 10 South Taranaki Bight Fish and Fisheries. NIWA Client Report No: WLG2012-13;
- (n) NIWA (2015) Report 17 Assessment of the scale of marine ecological effects of seabed mining in the South Taranaki Bight: Zooplankton, fish, kai moana, sea birds, and marine mammals. NIWA Client Report No: WLG2015-13;
- (o) NIWA (2016) Report 18 South Taranaki Bight Commercial Fisheries 1 October 2006 – 30 September 2015. NIWA Client Report No: 2016-28;
- (p) Fathom (2015) Report 25 South Taranaki Bight iron sand mining proposal Assessment of potential impacts on commercial fishing. 5 July 2013 and reconsidered 18 November 2015;
- (q) Martin Jenkins (2015) Report 40 Economic Impact Analysis of Trans-Tasman Resources Offshore Iron Sands Project. South Taranaki/Whanganui; Taranaki/Whanganui; New Zealand;
- (r) AUT (2013) Report 42 Iron sand extraction in South Taranaki Bight: effects on trace metal contents of sediment and seawater. AUT Client Report: TTRL2013;
- (s) SKM (2013) Review of technical reports relating to TTR marine consent application. Oceanographic processes and the physical environment for the New Zealand Environmental Protection Authority;
- (t) GHD (2016) Trans-Tasman Resources Ltd marine consent application – Review of sediment mobilisation and transport Dr A Berthot and Dr D Petch, 6 September 2016;

- (u) The primary expert evidence Dr Greg Barbara on marine ecology for the Fisheries Submitters, dated 23 January 2017;
- (v) The primary expert evidence of Mr Joris Jorissen on laboratory test and plume modelling for the Fisheries Submitters, dated 23 January 2017;
- (w) The primary expert evidence of Mr Andrew Smith on fisheries management for the Fisheries Submitters, dated 23 January 2016; and
- (x) The primary non-expert evidence of Mr Doug Loder and Mr Anthony Piper for the Fisheries Submitters, both in draft form at the time of completing this statement.

NEW ZEALAND SEAFOOD INDUSTRY

12. The fisheries sector of the New Zealand seafood industry employs about 13,700 people directly in fishing, seafood processing and related industries that provide infrastructure and services.¹ Many of these jobs are in small coastal centres where fisheries are an important component of the social fabric.
13. The seafood industry is an important contributor to the New Zealand economy. Export earnings from wild capture fisheries were \$1.38 billion in 2016, with the addition of approximately \$392 million from aquaculture.²
14. This revenue is derived from harvesting seafood from coastal and offshore waters and growing seafood through aquaculture. New Zealand's fisheries resources are renewable and are harvested sustainably.
15. Including other economic contributions, the New Zealand seafood industry, excluding Aquaculture, had a total economic output of \$4.26 billion in 2015 and a GDP contribution of \$1.683 billion in the same period.³ Of this

¹ The economic contribution of commercial fishing to the New Zealand economy. January 2017, BERL Reference No: #5643.

² Situation and Outlook for Primary Industries, December 2016. Ministry for Primary Industries.

³ The economic contribution of commercial fishing to the New Zealand economy. December 2016, BERL Reference No: #5643.

contribution, the inshore finfish sector made up \$1.36 billion and \$527 million in total output and GDP respectively.⁴

16. While globally there are significant challenges in many fisheries, New Zealand has overcome most of these problems through implementation of a world-class fisheries management regime. New Zealand's fisheries management system, the core of which is the Quota Management System (**QMS**), has been lauded internationally, and internationally peer-reviewed studies have found our system to be the best in the world.⁵

FISHERIES INSHORE NEW ZEALAND LTD

17. The seafood industry is represented by a number of industry bodies. There are five national organisations representing deepwater fisheries, rock lobster, paua, aquaculture and inshore finfish.
18. Fisheries Inshore New Zealand seeks to advance the interests of quota owners and fishers in inshore finfish, pelagic and tuna fisheries. Our vision is *A healthy sustainable fishery that is internationally-competitive, profitable and recognised as the preferred source for consumers of wild caught fish worldwide.*
19. Fisheries Inshore New Zealand is a nation-wide organisation and currently has 149 members with interests in 239 fish stocks. Collectively, members own more than 51% of the quota in 192 fish stocks and between 40 and 51% in a further 13 fish stocks.
20. Members of Fisheries Inshore New Zealand represent a broad cross-section of the New Zealand seafood industry with a long history of involvement in the South Taranaki Bight and areas beyond that may be affected by the application. This involvement is through quota ownership, commercial fishing operations, ownership of aquaculture assets and as licensed fish receivers.

⁴ Ibid.

⁵ Boris Worm, Ray Hilborn, et al (2009). Rebuilding Global Fisheries. *Science*, 325 (5940): 578–585.

Jacqueline Alder et al (2010). Aggregate performance in managing marine ecosystems of 53 maritime countries. *Marine Policy*, 34(3): 468–476.

Overview of Reasons for Opposing Application

21. Fisheries Inshore New Zealand opposes TTR's application for consent to mine in New Zealand's fisheries waters as, in my view, there is a real risk that the pre-existing rights and the economic well-being of quota owners and fishers will be adversely affected should consent be granted.
22. Existing commercial fishing and aquaculture rights, which I describe briefly below, are lawfully-established existing interests recognised in the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (**the EEZ Act**) and must be taken into account when determining whether a consent should be granted (Section 59(2)(a) of the EEZ Act).
23. Further, Section 59(2)(b) of the EEZ Act requires the Environmental Protection Authority (**EPA**) to take into account (amongst other things) the effects on the environment or existing interests of other activities undertaken in the area covered by the application or in its vicinity.
24. It is noteworthy that the Section 10(c) of the Fisheries Act 1996 (**the Fisheries Act**) requires decision makers to be cautious when information is uncertain, unreliable, or inadequate; and to take into account the principle that the biodiversity of the aquatic environment should be maintained (Section 9(b) of the Fisheries Act).
25. The aforementioned sections of the Fisheries Act are illustrative of a cautious and adaptive approach. Significant research is ongoing to assess the productivity of fish stocks and the effects of fishing on the aquatic environment. Fisheries Plans are established under Section 11A of the Fisheries Act that provide for input and participation and guide future use of fisheries resources.⁶ Management is iterative and adaptive. Changes are made at least annually to ensure management of fish stocks and the effects of fishing remain appropriate.

⁶ Fisheries Plans are statutory plans approved by the Minister responsible for the Fisheries Act 1996. They generally relate to one or more fish stocks or areas. Fisheries Plans may include fisheries management objectives, strategies and services required to meet those objectives and performance measures. The Minister must take the Fisheries Plan into account before setting or varying any sustainability measure.

26. While this imposes some cost on the seafood sector, it is important that effects are assessed and managed carefully when access to a public resource is being granted.
27. Under the EEZ Act, where information is uncertain or inadequate, the EPA is required to favour caution and environmental protection (Section 61(2) of the EEZ Act). There are significant gaps and inadequacies in the evidence supplied by the Applicant, and as such the DMC must proceed with caution.
28. The EPA “*must take into account*” any other applicable law (Section 59(2)(l) of the EEZ Act) and the nature and effect of other marine management regimes (Section 59(2)(h) of the EEZ Act). Fisheries in New Zealand are subject to extensive management regimes that the EPA is bound to take into account in determining this matter.
29. The Applicant’s scientific analysis is uncertain as to the possible downstream environmental and economic consequences should the proposed mining operation commence. I consider this is inconsistent with New Zealand’s international obligations as expressed in the Convention on Biological Diversity (**CBD**) and other international legal instruments (which I discuss further under “Reputational Risk”).
30. In my view, there is little evidence of a cautious or adaptive approach in the application. There is significant uncertainty associated with the application and I have concerns about the extent to which an adaptive management approach can be implemented in the absence of adequate baseline data (as discussed in paragraphs [87] to [94] of the expert evidence of Ms Helen Anderson for the Fisheries Submitters).
31. I consider the Application constitutes a risk to fisheries, not just in FMA 8 and adjacent areas, but also to New Zealand’s reputation as a world-class manager of fisheries and producer of seafood.
32. I am concerned that the application does not adequately address:
 - (a) The effects on the environment or our existing interests; or
 - (b) The risks of the proposed activity on the seafood sector; or
 - (c) The cumulative effects of the proposed activity; or

- (d) The importance of protecting the biological diversity and integrity of the marine ecosystem (Section 59(2)(d) of the EEZ Act) within which the inshore fishing industry operates; or
 - (e) Measures to avoid, remedy or mitigate the impact of the proposed activities (Section 59(2)(j) of the EEZ Act).
33. Further, I am concerned that there are inadequate checks and balances built into the application by way of conditions (Section 59(2)(j) of the EEZ Act).
34. Herein I provide an overview of the seafood industry for contextual purposes. My fisheries colleagues will elaborate on the risks posed to some of the existing fishing activities currently undertaken in the South Taranaki Bight.

The Quota Management System

35. The QMS was introduced in 1986 and is the cornerstone of New Zealand's fisheries management regime. Under the QMS, an annual catch limit (the Total Allowable Catch) is set for every fish stock. By controlling the amount of fish taken from each stock, the QMS sets the foundation for ensuring the sustainability of New Zealand's fisheries.
36. New Zealand law requires catch limits for every fish stock to be set at levels that will ensure their long-term sustainability. Catch is closely monitored by the Crown and financial penalties are enforced if catch allowances are exceeded in any year.
37. To support catch limits, the government contracts approximately \$20 million in research annually, much of which is recovered directly from quota owners under the Fisheries Act 1996. The seafood industry contributes approximately \$35.0 million annually through cost recovery levies, largely to pay for research and enforcement in support of managing New Zealand's fisheries.
38. Under the QMS, the commercial catching rights for each of New Zealand's 636 fish stocks have been split into quota shares, known as Individual Transferable Quota (**ITQ**), which can be freely bought and sold. This quota

right is granted in perpetuity and has been described by the New Zealand Court of Appeal as “a species of property”.⁷

39. The Crown has allocated or sold perpetual harvest rights to individual fishers. These rights have encouraged fishers to ensure their catch levels are sustainable because this ensures a permanent share of the fishery into the future.
40. The ownership of ITQ not only encourages a stewardship ethic that results in long term sustainability, but also provides an appropriate environment for investment.

Treaty Settlement

41. It is noteworthy that ITQ is not solely the domain of the commercial fishing sector.
42. To resolve Maori claims and litigation involving customary fishing, Maori and the Crown entered into an interim settlement under the Maori Fisheries Act 1989. This settlement provided for 10% of the quota for all fisheries then in the QMS to be allocated to Maori.
43. This settlement was superseded by the Fisheries Deed of Settlement, implemented through the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. This is the final settlement of all Maori claims to customary fishing rights. Under the settlement, the Crown additionally (among other things):
 - (a) gave Maori funds to purchase a 50% ownership stake in Sealord Products Ltd (then New Zealand’s largest fishing company); and
 - (b) undertook to provide Maori with 20% of the quota for all new species brought into the QMS after that time.
44. The distribution of Settlement assets is set out in the Maori Fisheries Act 2004, through which Maori have been provided with a substantial stake in commercial fishing as part of the Treaty Settlement.

⁷ *New Zealand Fishing Industry Association (Inc) v Ministry of Fisheries* (unreported, CA82/97, 22 July 1997, Wellington).

45. Any activity that undermines or erodes the value of quota under the QMS also has the effect of devaluing the Fisheries Deed of Settlement.

IMPACT ASSESSMENT ON FISHERIES INADEQUATE

46. The commercial sector involves many entities. As at 17 January 2017 there were 1,356 quota owners, 1,170 registered fishing vessels and 203 licensed fish receivers.
47. Many of these entities are interconnected through contractual arrangements to supply Annual Catch Entitlement (known as **ACE** which is the annual right to catch fisheries quota), use fishing vessels or to receive catch for processing and sale.
48. I consider the Applicant's analysis of the potential impact of the proposal on commercial fishing to be simplistic insofar as impacts are not properly considered in the context of lawfully established existing fishing activities. 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.
49. The evidence of Dr MacDiarmid purports to assess these impacts but conflates the effects on fish with the effects on fisheries. This is evident in paragraph [7] of her evidence where she states:

The scale of the mined area and the areas of elevated [SSC] are small compared to the area used by the populations of these species. Consequently they are likely to be displaced from ... a very small part of their distribution.

50. Paragraph [9] of Dr MacDiarmid's evidence provides a further indication that the wrong analysis has been undertaken:

A comparison of the distribution of effort and catch for each commercial fishing method in the STB over the period 2006 to 2015 with the distribution of SSC elevated above a fish avoidance threshold of 2 mg/l, indicated that the effects of the proposed iron recovery operations **on commercial fish species** will be negligible. **[Emphasis added]**

51. These conclusions are drawn in part from an analysis of ecological effects that uses as a key indicator the proportion of habitat affected by the mining operation.⁸ While this may be relevant to assessing biological and ecological consequences, it has only partial relevance when assessing impacts on fisheries.
52. Commercial fishing is an operation that is dependent on adequate biological resources being available (i.e. commercial fish species), but that is not the sole necessary precursor. An analysis of impacts on commercial fisheries needs to consider the economic aspect of the operation and ensure that it can remain economically viable alongside the proposed mining operation.
53. For example, no apparent analysis has been conducted on the possible economic effects that could result from changes in relative fish biomass or distribution. The NIWA report on Commercial Fisheries notes the work of Page (2014) in reference to the avoidance limits of fish species.⁹ Page notes that “[r]esponses to suspended solids are likely to be species-specific and dependent on individual life history”.¹⁰
54. Under the QMS, fishers buy ACE to reflect the balance of fish species likely to be encountered. Changes in the relative abundance of fish species as the result of seabed mining will result in catch plans that do not reflect the actual biomass available in the fishery. This has the effect of leaving fishers with either ACE they have paid for but cannot use, or excess catch for which ACE is not available. The latter result in a deemed value bill from the Crown. Both scenarios impose financial costs.

⁸ MacDiarmid et al 2015, Assessment of the scale of marine ecological effects of seabed mining in the South Taranaki Bight: Zooplankton, fish, kai moana, sea birds, and marine mammals. Prepared for Trans-Tasman Resources Ltd. September 2015. Table 2.2 at page 10.

⁹ MacDiarmid and Ballara. South Taranaki Bight Commercial Fisheries 1 October 2006 – 30 September 2015. Prepared for Trans-Tasman Resources Ltd May 2016 at page 7.

¹⁰ Effects of total suspended solids on marine fish: Pelagic, demersal and bottom fish species avoidance of TSS on the Chatham Rise. Prepared for Chatham Rock Phosphate, April 2014 at page 16.

55. Many inshore fishers hold quota or source ACE for a relatively small number of species. The consequence of a limited quota portfolio is that changes to relative fish abundance have a more significant effect on small operators as they are not able to source different combinations of ACE. For small-scale fishing operations, this could be critical and represents a serious risk to the viability of their businesses.
56. For example, changing the distribution and relative abundance of fish species may indeed be ecologically insignificant. The same species are present in the same numbers. However, a change in distribution may make catching those species economically unviable if catching costs increase due to greater dispersion, or greater distance from port. Similarly, catch composition may change requiring the fisher to source a different combination of ACE or pay a deemed value if no ACE is available. Both scenarios may have significant economic impacts on commercial fishing.
57. The NIWA report on commercial fisheries attempts to estimate the impacts on commercial catch and effort.¹¹ Fisheries data obtained from MPI were used to estimate the overlap between catch and effort data and the sediment plume. Again, the view was that the overlap was small and therefore the impact negligible.¹² As with the analysis above, this conclusion fails to consider the impacts in a fisheries management context.

¹¹ MacDiarmid and Ballara. South Taranaki Bight Commercial Fisheries 1 October 2006 – 30 September 2015. Prepared for Trans-Tasman Resources Ltd May 2016.

¹² Ibid at page 5.

58. For each species in the QMS, a number of Quota Management Areas (**QMAs**) are defined. ACE from one QMA cannot be used to catch that species in any other QMA. **Figure 1** below shows that the division between FMA 7 and FMA 8 cuts through the study area defined by NIWA. As such, any analysis of the impact of the plume as a function of the study area fails to appreciate that there are two distinct legal QMAs that apply for many of the most important species in question (e.g. GUR7/8, TAR 7/8, JDO 2/7, FLA2/7, SCH 7/8, SPO 7/8).

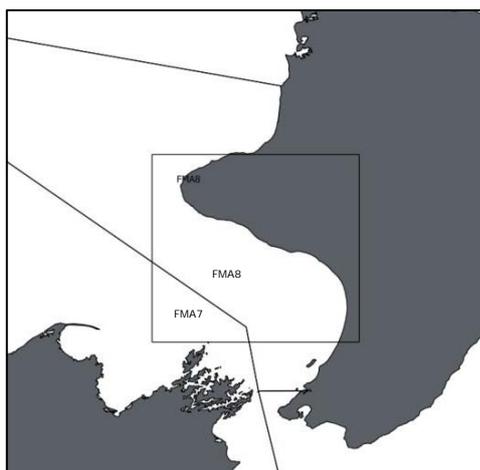


Figure 1: The “Study Area” used in MacDiarmid and Ballara with FMAs overlaid.

59. For example, Figure 3-3 in the NIWA report on commercial fishing illustrates a concentration of trawl catch and effort at the top of the South Island.¹³ Much of this catch is likely to be from QMAs that are different from the core area of the sediment plume.
60. In essence, the evidence adduced answers the wrong questions.

Economic Analysis

61. This error is then repeated in the evidence of Mr Leung-Wai who understandably relies on NIWA’s evidence. Mr Leung-Wai twice states that the impacts on fisheries will be “*negligible*”, on both occasions citing the evidence of Dr MacDiarmid.¹⁴
62. In Mr Leung-Wai’s substantive report he again relies on NIWA’s ecological assessment of effects and assumes that assessment represents the effects

¹³ Ibid at page 14.

¹⁴ Para 59 and 77 of his evidence.

on fisheries. As a consequence of relying on this information, there was no assessment of economic impact conducted.¹⁵

63. Rather, as an aside, Mr Leung-Wai provides a brief description of the scale of the commercial fishing industry for context.
64. I note that this description of the scale of commercial fishing only considers employment and processing in the local Taranaki/Whanganui area. While that is certainly an important component of any such analysis, it fails to appreciate that fish caught in the Taranaki region may be landed in Auckland, Raglan, Nelson or other ports. Fishers may also be domiciled in other areas. As such, these economic contributions are not included in the contextual description provided.
65. A partial description of the scale of commercial fishing is not a substitute for an analysis of the economic impacts of the proposal on the seafood industry as a whole.
66. I note that section 39 of the EEZ Act requires the effects of the activity on existing interests to be identified, and in sufficient detail to enable the EPA and persons whose existing interests are or may be affected to understand the effects on existing interests.
67. I question whether the information provided meets that requirement, a matter that will be addressed in more detail by our legal counsel, Mr Makgill.
68. For completeness, I note the sentence on page 30 of the Martin Jenkins Report that refers to the Ministry for Primary Industries' (MPI) 2013 submission and the analysis of Gibbs.¹⁶ The Applicant has not sought to rely on MPI's submission that uses data up to 30 September 2013 and cannot be considered to be based on the best available information. Similarly, the Fathom Report has not been relied upon in the Applicant's evidence with the NIWA analysis of May 2016 superseding both. Comments on both reports are provided in **annexure "A"** to this statement of evidence.

¹⁵ Economic Impact Analysis of Trans-Tasman Resources Offshore Iron Sands Project. South Taranaki/Whanganui; Taranaki/Whanganui; New Zealand. 30 October 2015 at pages 29-30.

¹⁶ South Taranaki Bight iron sand mining proposal Assessment of potential impacts on commercial fishing. Prepared by Nici Gibbs, Fathom Consulting Ltd for Trans-Tasman Resources Ltd. 5 July 2013 and reconsidered 18 November 2015.

Compounding Uncertainty

69. 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. While I have outlined above my concerns with that conclusion, the lack of sound analysis is amplified when considering the range of uncertainties in key aspects of the application.
70. The expert evidence of Dr Barbara for the Fisheries Submitters, dated 23 January 2017 notes there is uncertainty regarding the percentages of fine sediment in the plume and that there is a potentially considerable underestimate of the mud content. Dr Barbara concludes that this may result in the plume travelling much greater distances with consequent effects on the marine environment and fisheries.¹⁷
71. Mr Jorissen's expert evidence for the Fisheries Submitters, dated 23 January 2017 also notes at paragraphs [25] to [36] some key uncertainties in the plume modelling. Mr Jorissen notes the difference in interpretation of the settling tests and his preference for the NIWA interpretation that could result in a larger sediment plume than reported. Similarly, he notes that in examining the fate of material settling into the pits, only one depth, namely 5m, was considered in the modelling.
72. Mr Jorissen's view is that it is likely that there will be situations whereby the proportion of fine sediments escaping the pit will be significantly higher than those adopted in the studies. As a result, it is possible that the suspended sediment loads applied to the sediment plume model could be significantly underestimated during these periods.
73. The evidence of Dr James states that energy flow to the seabed would be reduced by 5.8% (range 3.1-11.9%) for mining at Location A and less than that for mining at Location B.¹⁸ However, this is an average over the entire modelling domain, an area of some 13,300 km².¹⁹ In locations closer to or down-current of the mining sites, the localised effects will be higher. There is

¹⁷ Primary Expert Evidence of Dr Gregory Matthew Barbara for the Fisheries Submitters, 23 January 2017 at [41].

¹⁸ I note that the evidence of Dr Cahoon estimates the average reduction in energy flux over the SMD to be 5.8% with mining at Site B and 8.4% with mining at Site A, at [27].

¹⁹ Expert Evidence of Mark Richard James on behalf of Trans-Tasman Resources Limited, 15 December 2016 at [48].

no analysis of more local-scale reductions of energy flow and no analysis of the effects this may have on fisheries resources or fisheries.

74. Estimates of the reduction in primary productivity are also averaged over the entire Sediment Modelling Domain (**SMD**).²⁰ While Drs James and Cahoon suggest these reductions are small at the SMD scale, there is no analysis of local-scale effects that may have a negative influence of commercial fish species or fisheries.
75. Figure 5 in Dr Cahoon's evidence for the Applicant dated 15 December 2016 illustrates this point well. It shows that of the area in the SMD receiving sufficient light to support microphytobenthos, 13% would experience 50% reduction in light and c. 8.5% would experience a 70% reduction in light. The absolute area of the SMD receiving >E are not provided but if one assumes this applied to the whole SMD the areas are 2,005 km² and 1,136 km² respectively; the actual areas affected being less than this. What local-scale effects would this have on fisheries resources and fisheries?
76. Sensitivity analyses should have been conducted to assess the effects of this uncertainty. This analysis would have implications for water column and benthic primary productivity and fish distribution. The range of plausible effects could then have been used to undertake an appropriate impact assessment on commercial fisheries.
77. With so much uncertainty, the effects on those that are lawfully using the marine environment cannot be adequately described. Without the capacity to appreciate the effects of the proposed seabed mining operation, it is unreasonable to expect those with a history of sustainable resource use in the area to risk their businesses, their livelihoods and their future on mathematical approximations and supposition for the financial benefit of someone else.

²⁰

See James at [60] and Cahoon at [27].

REPUTATIONAL RISK

78. The seabed mining proposal presents risks to New Zealand's reputation as a supplier of premium seafood, a world-class marine manager and responsible international citizen.

Risk to New Zealand Seafood

79. Excavating large areas of the seabed and discharging tens of millions of tonnes of mining waste into the water column each year projects a negative image of New Zealand's marine management to export markets. New Zealand trades on its reputation as a clean and unspoilt environment in marketing collateral for both tourism and primary industries. This is evident from major government initiatives such as the New Zealand Story.²¹
80. In my view, the Applicant's proposal is directly counter to the New Zealand brand upon which the seafood industry trades. Clean water, sustainable harvest, world-leading management, the highest quality seafood, and a light environmental footprint are among the important factors used to gain access into the most discerning markets.²²
81. In addition to the generic reputational risk, the potential impact on fish quality caused by increased sediment loads and other contaminants puts the competitive advantage enjoyed by New Zealand seafood products at risk. The New Zealand seafood industry has invested vast resources in demonstrating its sustainability credentials and enhancing the quality of our seafood to reach premium markets.²³ Many of New Zealand's target markets have a very low tolerance to reduced fish quality.
82. The Applicant's experts state that contaminant levels in the sediments are low and would be rapidly diluted below ANZECC guidelines for the protection of

²¹ The New Zealand Story describes itself as an initiative that defines the distinctly Kiwi attributes that make us unique and provides a framework to help us better communicate our value to the world. www.nzstory.govt.nz

²² For example, see the strapline on Moana New Zealand's homepage: *Premium seafood from the pristine waters of Aotearoa New Zealand.* www.moana.co.nz.

²³ 70% of New Zealand's deepwater catch is independently certified as sustainably caught by the Marine Stewardship Council.

Government and three major seafood companies have invested \$52 million to develop innovative trawl technology to improve selectivity and fish quality. See <http://www.precisionseafoodharvesting.co.nz>

aquatic biota.²⁴ The ANZECC guidelines establish four different protection levels: 80%, 90%, 95% and 99%. These signify the percentage of species expected to be protected. Each percentile has an associated current estimate of the concentrations of chemicals that should have no significant adverse effects on the aquatic ecosystem.

83. While the likelihood of these effects is small, that is only one component of assessing risk. What requires consideration is the consequences to the seafood industry should these effects materialise. If New Zealand seafood was to be seen as substandard, or in some way tainted as a result of the Applicant's activity, this could have significant negative effects on the export revenue received from all New Zealand seafood. Particularly given our emphasis on high-end markets and discerning consumers. The international market sees New Zealand seafood as a single source product and as such all New Zealand seafood could be affected, not just that from the area in question. Like the assessment of effects on fisheries, the Applicant has applied a biological test to an economic endeavour.

Risk to New Zealand's International Reputation

84. As discussed earlier in my evidence, New Zealand's fisheries management regime takes a cautious and adaptive approach to fisheries management.
85. The key principles upon which the Fisheries Act are based are derived from New Zealand's international obligations under the United Nations Convention on the Law of the Sea (**UNCLOS**); among those obligations is the general obligation "*to protect and preserve the marine environment*" (Art 192). Section 5 of the Fisheries Act requires international obligations relating to fishing to be taken into account, which in part has led to the cautious and adaptive approach to fisheries management.

²⁴ Expert Evidence of Mark Richard James on behalf of Trans-Tasman Resources Limited, 15 December 2016 at [first paragraph 11 and 96].
Kay Vopel, John Robertson, Peter S. Wilson. Iron sand extraction in South Taranaki Bight: effects on trace metal contents of sediment and seawater. AUT Client Report: TTRL2013, 8 September 2013.

86. A range of other international instruments also guide fisheries management, including:
- (a) The United Nations Convention on Biological Diversity (CBD);
 - (b) The UN Fish Stocks Agreement (UNFSA) dealing with the Conservation and Management of Straddling Fish stocks and Highly Migratory Fish Stocks such as skipjack tuna; and
 - (c) Various International Plans of Action.
87. In common with the Fisheries Act, Section 11 of the EEZ Act refers to UNCLOS and the CBD as being among the international conventions being implemented through the EEZ Act.
88. The CBD emphasises the present and future value of biological diversity within the national jurisdictions of contracting states, and has as its aims, the conservation of biological diversity and the sustainable use of each of the components of the marine environment.
89. Each signatory State to the CBD (including New Zealand) has responsibility for the conservation and sustainable use of its own biological diversity and to manage its own processes and activities which could threaten biological diversity.
90. The Report of the United Nations Conference on Environment and Development (Rio de Janeiro, 3-14 June 1992) in the context of the marine environment affirms this and, calls on states to:
- ... in accordance with the provisions of the United Nations Convention on the Law of the Sea on protection and preservation of the marine environment, commit themselves, in accordance with their policies, priorities and resources, to prevent, reduce and control degradation of the marine environment so as to maintain and improve its life-support and productive capacities. To this end, it is necessary to:
- (a) Apply preventive, precautionary and anticipatory approaches so as to avoid degradation of the marine environment, as well as to reduce the risk of long-term or irreversible adverse effects upon it.

91. New Zealand has a reputation in the international community as a leader in environmental management and any action that offends international principles to which New Zealand has agreed, and abided by for decades, could undermine that reputation.
92. As has occurred through implementation of the Fisheries Act, a cautious and adaptive approach should also be adopted here to ensure consistency of approach and to ensure that New Zealand continues to give effect to the principles that we have accepted as a nation.

CONSULTATION

93. The evidence of Mr Tokatumoana Walden for the Applicant states that a number of commercial operators in the fishing industry considered TTR's consultation to be inadequate. Mr Walden further states that fisheries submitters acknowledged and supported the submission of Fisheries Inshore New Zealand and therefore the concerns raised in the Fisheries Inshore submission reflect the views of industry as a whole.²⁵
94. Similarly, the evidence of Mr Thompson states that Fisheries Inshore New Zealand submitted that TTR's engagement was inadequate.²⁶
95. Contrary to these assertions, the submission of Fisheries Inshore New Zealand dated 12 December 2016 makes no mention of TTR's consultation or its adequacy.
96. Fisheries Inshore New Zealand met with TTR on a number of occasions prior to TTR lodging its Application to better understand the nature of the second application and the extent to which it differed from the initial proposal. While there was consultation, I question the value of it as there was no concrete information supplied as to the potential effects of the operation. Rather, we were simply broadly consulted on the nature and scope of the proposal. Fisheries Inshore New Zealand reserved its position on the matter until we could assess the second proposal based on the application proper.

²⁵ Corporate Evidence of Tokatumoana Kevin Walden on behalf of Trans-Tasman Resources Limited, 16 December 2016 at [127] to [129].

²⁶ Corporate Evidence of Shawn Thompson First Statement - Project Description on behalf of Trans-Tasman Resources Limited, 16 December 2016 at [86] to [89].

97. TTR offered to provide its confidential information regarding the plume modelling via the confidentiality agreement, but Fisheries Inshore New Zealand declined. If Fisheries Inshore New Zealand did state that it would not review the Plume modelling, this was in relation to the pre-application data under the confidentiality agreement. At the time, Fisheries Inshore New Zealand had no expertise to do so. There was certainly no intention not to engage in reviewing that work as part of the substantive process.
98. The Applicant's evidence on consultation also seems to be inconsistent. TTR has previously stated that Fisheries Inshore New Zealand signed the confidentiality agreement in order to review the plume modelling data prior to the lodgement of the application. I still have not seen any proof from TTR that this was the case. I certainly did not sign any such agreement, and nobody else within Fisheries Inshore New Zealand had delegated authority to sign such an agreement.

CONCLUSION

99. In summary, I conclude that:
- (a) The Applicant has not adequately understood or analysed the effects on fisheries that may result from the proposed mining operation.
 - (b) The Applicant has not conducted an economic impact analysis on the commercial fishing sector.
 - (c) The Applicant has not provided details on the local-scale effects of the mining operation with regard to the reduction of light levels or primary production. Both factors may have direct and indirect impacts on fisheries that are not adequately considered.
 - (d) The Applicant's proposed mining operation is inconsistent with the attributes of New Zealand seafood that are relied upon to reach high value markets. Any reputational damage may impact on the New Zealand seafood industry as a whole, an industry that generated export revenues of \$1.77 billion in 2015 and is a major employer.

Dated this 23rd day of January 2017



Jeremy Helson

ANNEXURE “A”**COMMENTS ON 2013 MPI SUBMISSION AND
THE REPORT OF FATHOM CONSULTING LTD**

1. As set out in paragraphs [61] to [68] of my evidence, the Applicant has not sought to rely on MPI’s submission of 2013. Similarly, little emphasis has been placed on the analysis of Fathom Consulting with reliance instead placed on the NIWA analysis of May 2016. That notwithstanding, I provide some comment on the MPI and Fathom information.

Shortcomings in statutory reporting

2. The use of the MPI analysis is a useful starting point. That analysis is simply an extraction of data from several types of statutory form that have significantly different levels of accuracy. The limitations of these data were acknowledged by MPI and Fathom Consulting and it was noted that significant assumptions must be made because of the coarse nature of much of the available data. This is particularly so for smaller inshore vessels that are only required to report starting positions or catch from large statistical areas. This leads to significant uncertainty about the accuracy of any analysis based on statutory catch reporting. The catch effort system is simply not designed for the type of spatial analysis conducted.

Timescale used for analysis

3. I consider the timescale used in the analyses was too short. The nature of fisheries is such that there can be significant changes in catch due to longer term fluctuations in environmental conditions, or to choices companies make based on market demands, exchange rates or other commercial drivers. A longer analysis would have provided insight into such variations and given the DMC a more complete picture of the catch that has been taken from the area in question.

Use of incomplete model

4. MPI’s assessment of the direct effects of fishing was largely based on an analysis of catch. Initial iterations of the model used in that analysis had been peer reviewed by MPI working groups. However, at the time of MPI’s submission, the final report documenting the methodology was not available

and had not been finalised through MPI's peer review process. It is normal practice in fisheries science that information is not used in management decisions until the Chair of the relevant working group has accepted the work as complete and robust. Further, such work is assessed against the *Research and Science Information Standard for New Zealand Fisheries* that was approved by Hon Phil Heatley as Minister of Fisheries in 2011. This is essential to ensure that only robust information is used as the basis for management decisions that have an influence on fisheries management.

Narrow spatial analysis ignores the effect of the plume

5. Both the MPI and Fathom analyses primarily consider the direct effect on fishing that would occur by excluding that effort from the area mined. However, it is clear that the plume created by this activity would be significantly larger than any area from which seabed was removed (e.g. Fathom at pages 2, 3, 31, 32 and MPI at page 5).

Asserting fishing can occur elsewhere is simplistic

6. It is simplistic to assert that fish that are redistributed will be available elsewhere in the South Taranaki Bight. Fishing is a carefully directed activity and fishers must target optimal aggregations to make fishing economically viable. Any significant disturbance to fish distribution can make a particular fishery economically unviable (albeit that the fish may still be present, somewhere). A number of factors will increase the costs of fishing, sometimes significantly. For example, if fishers have to search for fish in new locations, catches are smaller or occur at lower rates, or if catches are taken in different compositions, this requires sourcing additional ACE or incurring deemed values.