

**BEFORE THE ENVIRONMENTAL PROTECTION AUTHORITY
AT WELLINGTON**

IN THE MATTER

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

AND

IN THE MATTER

of a decision-making committee
appointed to hear a marine consent
application by Trans Tasman Resources
to undertake iron ore extraction and
processing operations offshore in the
South Taranaki Bight

**EXPERT EVIDENCE OF JASON LEUNG-WAI ON BEHALF OF TRANS
TASMAN RESOURCES LIMITED**

15 DECEMBER 2016



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EXECUTIVE SUMMARY

1. Martin, Jenkins and Associates Ltd (MartinJenkins) conducted an economic impact assessment (EIA) of the Trans-Tasman Resources (TTR) iron sands extraction project on three study areas – South Taranaki/Whanganui, Taranaki/Whanganui, and New Zealand.

Operations and expenditure

2. The operational expenditure for the iron sands project is estimated to be approximately \$254 million (m) annually. Of that, it is estimated that \$133m will be spent in New Zealand. \$73m is expected to be spent in the Taranaki/Whanganui region, with \$35m expected to be spent directly in the South Taranaki/Whanganui area.
3. Based on their operational plan, TTR will directly employ 227 marine personnel and a further 35 administrative/corporate employees. Of these, 61 will be employed directly in South Taranaki/Whanganui, 167 will be employed directly in Taranaki/Whanganui, and 230 will be employed in New Zealand. A further 32 employees will be employed offshore.

Economic impacts

4. In South Taranaki/Whanganui, initial annual expenditure on the iron sands operation of \$35m will generate about \$45m in expenditure and \$19m in Gross Domestic Product (GDP), and support a total of 299 jobs each year.
5. In the broader Taranaki/Whanganui study area, annual expenditure on the iron sands operation of \$73m will generate about \$116m in expenditure, \$51m in GDP and support a total of 705 full time jobs each year.
6. Nationally, expenditure on the iron sands operation of \$133m will generate about \$349m in expenditure, contributing \$159m to GDP and supporting 1,666 jobs each year.

Royalties and exports

7. The project will contribute to Government income through royalties and taxes and to New Zealand's export earnings. At a conservative price of US\$40/tonne and a US\$/NZ\$ exchange rate of \$0.65, the project would contribute about NZ\$6.15m in royalties and about NZ\$310m in exports each year. The Government would also collect taxes from the venture.
8. Royalties and taxes would increase significantly at higher prices as profits increase and royalties move to accounting profits rather than sales revenue.

Wider benefits

9. Assessment of the benefits from the project also suggests that the project would complement and strengthen existing activity and businesses in the local and regional study areas. The iron sands project is consistent with the oil and gas activity occurring in the region and will support and sustain existing businesses in the region. Further, it will diversity the mix within the minerals sector and regional exports.
10. The project will be based in relatively small, rural economies. While economic impacts will be lower due to leakage of activity, the benefit to these areas will be greater than if the project was based in New Plymouth, or Auckland. TTR aims to direct as much activity into, and employ as many as practical, from within the local area. This is in relation to its own employment intentions, the development of a training school in Hawera¹, and encouraging key contractors and suppliers to support local activity.

¹ Proposed Consent Conditions section 2.4 Community relationships p 18.

INTRODUCTION

Qualifications and experience

1. My name is Jason Leung-Wai. I graduated in 1996 with an MBS Economics from Massey University. I also have a BBS in Economics and Finance from Massey University, and a Graduate Diploma in Economic Development from AUT. I am a Senior Consultant at MartinJenkins.
2. I have been engaged in policy, economic research and consulting for 20 years in the public and private sectors. The iron sands project is aligned to many projects that I have been involved with. I have undertaken a number of economic impact analyses in the minerals sector including the oil and gas sector in Taranaki and mining on the West Coast. I have also undertaken a range of projects that have given me insights into the Taranaki region.
3. I started in Business Policy in the Ministry of Commerce in 1996 where I worked for 7 years on business, industry and regional economic development policy.
4. I spent a further 10 years at Business and Economic Research Limited as a consultant working on regional development. In that time I authored numerous economic impact reports, with several relating to the minerals sector as well as in the Taranaki region. Within the Taranaki region itself, the economic impact studies I have completed include: Methanex, a Todd Energy project, Port Taranaki, an LNG plant, and another report for the oil and gas sector. I was also the lead consultant on the Taranaki regional economic development strategy in 2010.
5. In my three years at MartinJenkins I have completed an update of the economic impact of the oil and gas sector on the Taranaki region and New Zealand (2014). In South Taranaki, I have undertaken work on the potential economic

value of Parihaka (2015), which has given me further insights into the study area.

Code of conduct

6. I confirm that I have read the Code of Conduct for Expert Witnesses as contained in the Environment Court Practice Note dated 1 December 2014. I agree to comply with this Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

7. My evidence shows the likely direct, indirect and induced impacts that the direct activity from the planned TTR iron sands operation will have on expenditure, GDP and employment in three study areas over a one year period.
8. The first two study areas are where the main impact of the activity is expected to occur. These areas are defined by local authority boundaries – Whanganui district/South Taranaki district, and Whanganui district/Taranaki region. I looked at New Zealand as a third study area.
9. My assessment uses Input Output (I-O) multiplier analysis, which is an internationally accepted method for analysing the impacts of expenditure at a regional level in terms of GDP (value added) and employment. I-O multiplier analysis is also used to estimate the indirect and induced activity in the study areas as a result of the initial (direct) activity.
10. I-O tables used in the analysis were provided by Butcher Partners Ltd. Butcher Partners is a recognised producer of regional I-O tables, which have been used in many regional economic impact studies in New Zealand, including for consent applications.

11. Expenditure within each of the study areas was provided by Trans-Tasman Resources Limited (TTR) and is based on an operational plan that estimates operational expenditure and direct employment requirements to recover 5 million tonnes of iron ore each year for 20 years from the South Taranaki Bight.
12. The operational expenditure suggests a cost of production (cfr)² of around US\$30 per tonne, which is at the lower end of costs for existing iron ore mining operations.³ The operational budget allowed me to identify expenditure in different industry areas within each study area.
13. By focussing on operational expenditure to access a fixed amount of resource, the analysis is not affected by changes in resource price. Similarly, exchange rates are a second order factor in that some products used in the operations may go up or down in price if the exchange rate changes result in the supplier changing their price, such as for fuel.
14. TTR also provided a roster of employees that would be directly employed for their iron sands operation. I also identified likely employment requirements for major suppliers to the operation, such as for fuel bunkering.
15. Where relevant I used TTR's employee roster and likely employment requirements for fuel bunkering to determine direct employment rather than estimating employment from operational expenditure. I believe this increases the accuracy of the results because it is counting jobs that will be actually being provisioned for rather than estimating jobs based on the output to job ratio in that industry.

² Cost and Freight.

³ Metal Expert Consulting estimates that breakeven costs range from US\$25/ton up to US\$90/ton. http://metalexpertresearch.com/research/en/global_iron_ore_price_for_ecast_nov_2015.html?OpenDocument

ASSESSMENT OF EFFECTS

16. The project is to extract and export 5 million tonnes of iron ore concentrate annually from the South Taranaki Bight. Activity will largely occur offshore, using an integrated mining vessel and a transshipment vessel. Iron ore will be transferred directly from the transshipment vessel to bulk carrier vessels for export to world markets.
17. Onshore operations associated with the project will be run out of South Taranaki, Whanganui and New Plymouth. An anchor handling tug will operate out of New Plymouth. A geotechnical service vessel will operate out of a base in Whanganui. Engineering maintenance support could be provided from South Taranaki.
18. The project will directly require over 200 people to operate the various vessels, with a further 50 staff required in support, engineering, administration, environmental and other contracting roles. In all, TTR is looking at employing a total of 262 people. The majority of these will be based in the Whanganui/Taranaki area.
19. The project will also purchase services from a number of other independent businesses. Many of these services can be delivered from within the study areas. This includes fuel bunkering, environmental monitoring, repairs and maintenance, health and insurance, and business services.
20. The operational expenditure for the project is estimated to be approximately \$254m annually. Of the \$254m, \$133m will be spent in New Zealand. \$73.4m of the \$132.7m is expected to be spent in the Taranaki/Whanganui region, with \$34.6m of that spent directly in the South Taranaki and Whanganui districts.
21. I assigned expenditure to seven industries across the three study areas as shown in the following table.

Industry	Expenditure (\$m)		
	South Taranaki/Whanganui	Taranaki/Whanganui	New Zealand
Fabricated metal product manufacturing	21.3	21.3	21.3
Exploration and other mining support services	7.6	17.2	34.4
Scientific, architectural and engineering services	3.7	15.8	15.8
Other transport	2.0	10.4	10.4
Basic material w wholesaling	0.0	6.5	32.6
Legal and accounting services	0.0	2.1	14.2
Health and general insurance	0.0	0.0	3.9
Total	34.6	73.4	132.7

South Taranaki/Whanganui

22. The direct expenditure of \$34.6m in South Taranaki/Whanganui is likely to contribute \$13.6m to GDP and employ 173 people full time.
23. Including indirect and induced impacts, the contribution to GDP increases to \$18.6m and employment increases to 299 full time jobs.
24. Based on the study areas' GDP and employment as at March 2015, the iron sands project would increase GDP by half of a percent and employment by close to one percent.

Taranaki/Whanganui

25. The direct expenditure of \$73.4m in Taranaki/Whanganui is likely to contribute \$30.4m to GDP and employ 367 people full time.
26. Including indirect and induced impacts, the contribution to GDP increases to \$50.6m and employment increases to 705 full time jobs.
27. Based on the study areas GDP and employment as at March 2015, the iron sands project would be similar to the South Taranaki/Whanganui impact, increasing GDP by half of a percent and employment by close to one percent.

New Zealand

28. The direct expenditure of \$132.7m in New Zealand is likely to contribute \$59.0m to GDP and employ 463 people full time.

29. Including indirect and induced impacts, the contribution to GDP increases to \$159.0m and employment increases to 1,666 full time jobs.

Royalties and taxes

30. At a conservative price of US\$40/tonne and a US\$/NZ\$ exchange rate of \$0.65, the project would contribute \$6.15m in royalties and about \$312m in export earnings each year. The Government would also collect taxes from the venture.
31. Royalties and taxes would increase significantly at higher prices as profits increase and royalties move to accounting profits rather than sales revenue.
32. At \$312m, iron ore exports would have been one of New Zealand's top 20 principal exports in 2015.

Qualitative benefits

33. The project is complementary to the Taranaki economy, which has well-developed oil and gas, dairy and engineering sectors. The skills and services applied to those sectors will also be relevant to the iron sands project. This means that a greater proportion of spend will occur in the region and that local businesses get another source of revenue.
34. At the same time the study areas have a strong dependence upon the oil and gas and dairy sectors which are affected by commodity cycles and global demand. Iron ore, although correlated to an extent with oil and gas prices, will provide some diversification within the region and will increase the region's resilience to price changes in those key sectors.

Local development

35. TTR has signalled an interest in contributing positively to the local economy.⁴ It is exploring the possibility of basing a training school in South Taranaki and has set a targeted level of local employment. TTR is keen to establish as many of the support functions in the local area as it possibly can and utilise local services where possible. TTR is looking to establish a development fund with South Taranaki District Council to support regional development activity.
36. These activities are not considered within the economic impact analysis scope as they were still at the exploratory stage at the time of the analysis. I understand, however, that if these activities proceed that there will be other positive benefits for the local community. For example, the proposed training facility in Hawera could employ 10 full-time people each year.

RESPONSE TO EPA REPORTS AND SUBMISSIONS

GHD peer review

37. Wenceslaus Joseph van Lint from GHD was commissioned by the Environmental Protection Authority (EPA) to peer review the economic impact analysis. The review accepted the overall outcome of the analysis, particularly the regional study areas. However, GHD suggested that national impacts may be overstated at the margins, and questioned whether it was possible to verify the precise benefit based on the analysis and information provided.

National impacts overstated at the margins and likely to be minimal

38. GHD noted that, due to inherent weakness in the I-O methodology, the national estimates “may be overstated at

⁴ Noted in the Indicative Marine Consent and Marine Discharge Consents Conditions p. 18

the margin". More specifically, GHD argues that this is due to the one-directional nature in the application of multipliers. Finally GHD note that the impact on the overall New Zealand economy is likely to be minimal.

39. I do not accept the review's statement that impacts at a national level may be overstated at the margins. Further, I-O analysis is, by design, one directional.
40. The I-O model estimates impacts that result from a set level of economic expenditure into different industries within a defined study area. Additionality and diversion of activity need to be considered in determining the initial level of economic expenditure in the study area that is put through the I-O model.
41. My analysis has considered and addressed additionality and diversion. In particular, activity is likely to be additional because it is new investment that would not otherwise occur or be moved from other areas of investment in the study areas. There is unlikely to be a diversion of activity as investment is global and unlikely to reduce investment in other areas. Further, there is sufficient capacity in the study area (and nationally and globally for skilled labour), which will have a minimal effect on the ability of other activity or projects to operate.
42. GHD suggests that the impact on the New Zealand economy is likely to be minimal. In my opinion, the numbers speak for themselves. GDP of \$159m, 1,666 full time jobs, and the export value from 5,000 tonnes of iron ore each year is not minimal in my view.
43. If anything the national benefits are understated as the analysis does not consider the positive impacts as a result of royalties or company taxes paid, which would likely be

reinvested into the economy through government expenditure.

44. GHD's second argument for overstating national impacts is based on negative impact, especially if there is an imbalance of skilled labour. GHD also noted that the lack of skill in the local employment market has the potential to overstate the employment multiplier.
45. I accept that there is currently a tight market for skilled labour. This is acknowledged in the TTR business case. Most of the direct jobs generated by the project require certain levels of skill and experience. Most of the direct jobs offered locally are likely to be filled from the wider Taranaki region or nationally. Some of the high-skilled jobs are likely to be filled from offshore. Therefore, any displacement effects will be minimal. Over time, TTR would look to encourage the development of skills locally to replace offshore labour.
46. In relation to the employment multiplier, I accept that there is a possibility that businesses benefiting from indirect or induced activity may have trouble attracting skilled employees and they may look at other ways of meeting increased demand. However, some businesses in the study area are operating in a depressed market and are therefore operating at less than capacity and finding it difficult to support existing staff levels.⁵ This is a potential source of skilled employees that will not adversely affect existing businesses.

Lack of detail in the annual expenditure estimates

47. The GHD review noted the lack of detail in the annual expenditure and the build-up of the total labour cost. This makes it difficult to accept the 'precise' forecast as it stands.

⁵ This was identified in an earlier study I undertook on the oil and gas sector in Taranaki "The Wealth Beneath our Feet: the next steps.

48. In the report and through further information requested by the EPA I provided an estimate of expenditure broken down by industry for each study area. In my view, this provides sufficient detail to understand and assess how much and where expenditure is expected to occur.
49. In relation to labour costs, the analysis used the actual operational estimates provided by TTR to determine direct employment impacts. Operational expenditure from the business case, which included labour costs were used to estimate direct GDP. A break-down of labour costs is unlikely to improve the preciseness, or the ability of GHD to assess the preciseness, of the analysis.

Validity and cross-referencing

50. GHD noted that the multipliers used were developed by a third party applying a bottom-up approach and that the multipliers were not cross-referenced to similar analysis carried out for other projects or to established New Zealand regional multipliers.
51. In response I note that 'official' regional multipliers do not exist. Further, there are no established or recognised regional multipliers in New Zealand. All regional I-O tables and multipliers in New Zealand are provided by third parties, who all apply a bottom up approach to derive regional tables. These include Butcher Partners and more recently, Insight Economics. Other agencies have developed regional multipliers for their own use, such as Market Economics.
52. As noted, the study used multipliers from Butcher Partners. Butcher Partners is an acknowledged and well referenced supplier of regional multipliers that have been used in numerous economic impact analyses used for consenting purposes. I consider it was appropriate to use the Butcher Palmers multipliers as:

- (a) Butcher Partners I-O tables have been used as they are available at the territorial authority level, whereas Insight Economic's tables are only available at the regional council level. This allowed me to model the Whanganui-South Taranaki study area.
 - (b) Butcher Partners tables were used for the economic impact of oil and gas on the Taranaki economy report.
 - (c) Butcher Partners tables have been used for a number of economic impact analyses over the years across a number of types of industries and projects and across most regions in New Zealand. They are arguably the most widely used in New Zealand economic impact analyses. They are used by a number of other agencies and economists such as Business and Economic Research Limited and Infometrics.
53. Further, all regional multipliers currently available in New Zealand are underpinned by a New Zealand I-O table developed by Statistics New Zealand. The New Zealand I-O tables are used in the national study area.
54. I have not compared the industry and regional multipliers of the different providers. I rely on their professional capability for the accuracy of the multipliers. It is clear that there are assumptions made in developing these multipliers and these are clearly noted in the analysis.
55. I have not cross-referenced the multipliers against other projects as multipliers will be different for every project depending upon how expenditure is assigned across industries and the study area being considered.
56. Assuming the same multiplier set is used; multipliers at the industry level will be the same. Similarly the 'direct' multipliers

for each industry are consistent across regions. It is assigning where the expenditure occurs (within the study area or outside it and the industry in which it is spent) that ultimately determines the aggregated multiplier.

57. Different projects will have different expenditure patterns. Calculations are made at the individual industry level (106 industries) and then summed to provide the total impact. Hence multipliers will be different for each project based on the study area and the project. Finally, determining a comparable region is a very subjective exercise and would raise its own issues.

Discussion on the potential costs of the project, in particular tourism and commercial fishing

58. GHD pointed out the section in the study where I discussed potential costs of the project, specifically on the tourism and fishing interests and suggested that despite the difficulty of determining or quantifying the potential costs I concluded that "when considering the balance of economic effects of the project, the positive economic impacts are significantly greater than any other effects."
59. There are perceptions that the iron sands project would have detrimental effects on other industries in the study areas, in particular tourism and recreational/commercial fishing. Activity is not visible from the shore and so is unlikely to directly affect tourism. Expert evidence⁶ suggests negligible impacts on commercial fisheries. As the project area is relatively small, confined and well offshore, recreational fishers may be inconvenienced but are free to fish in different areas. The discharge consent conditions are designed ensure that any negative impacts are identified early and addressed.

⁶ Expert evidence of Dr Alison MacDiarmid.

60. I included this section in the study simply to demonstrate the quantum of what a considered potential negative impact might be rather than as a cost-benefit analysis (CBA) of the project.
61. I estimated the expenditure generated by tourism and commercial and recreational fishing in the South Taranaki/Whanganui (\$142m) and Taranaki/Whanganui (\$369m) study areas. The majority of this activity (89% and 87% respectively) was tourism related.⁷ This is the expenditure that could potentially be lost to the study areas if the project completely stopped these activities from occurring.
62. However, the chances of negative effects are negligible and it is very unlikely that activity would completely stop if negative effects occurred. To demonstrate the possible costs if the project did result in negative impacts, I applied a risk approach where I assumed a 1 percent chance of negative impacts occurring and that these impacts would result in a 10 percent decline in tourism and commercial and recreational fishing.⁸ This resulted in lost economic activity of \$142,000 in South Taranaki/Whanganui and \$369,000 in Taranaki/Whanganui.

Other submissions

63. A number of submissions were received raising concerns with the economic analysis study. The concerns tended to focus on the level and use of royalties, the low level of local employment and employment in general, and the impact of the project on other sectors such as tourism and commercial fishing. These issues are discussed in turn.

⁷ I considered the possible impact at a national level to be negligible.

⁸ The choice of 1% as the likelihood of negative impacts occurring and the 10% impact on activity are purely arbitrary and were selected to demonstrate a risk based approach to potential negative effects.

Low royalties and foreign ownership

64. A number of submissions (Jenny Duncan, Glenys Ellett, David Olson, Alison Adams-Smith, Annette Andrews, Jefferson Lucas, Hinemaria Ward-Holmes, KASM, Roger Malthus, Greenpeace New Zealand) were received raising concerns with the low royalty rates and/or the fact that profits will be directly exported overseas.
65. The royalty regime is for the higher of - a) an ad valorem 2% of the net sales revenue of the minerals obtained under the permit and b) an accounting profits royalty of 10% of the accounting profits. In paragraph 30, I have estimated royalties at \$6.15m with a conservative iron ore price. This is not insignificant. Royalties and taxes would increase significantly at higher prices as profits increase and royalties move to accounting profits rather than sales revenue.
66. The issue of how Government collects and distributes royalties is an issue that is often raised in regions where petroleum and mineral production occurs. However, this is a broader issue that cannot be answered through this forum.
67. In relation to concerns about foreign ownership, TTR is a New Zealand company and will pay royalties and normal New Zealand corporate taxes. It has 42 shareholders, of which 19 are from New Zealand.⁹ It will purchase goods and services in, and employ people in, New Zealand who will also spend in, and be subject to tax in, New Zealand.

Minimal local employment and high level of out-of-region employees

68. A number of submissions (Jenny Duncan, Glenys Ellett, David Olson, Alison Adams-Smith, Annette Andrews, Jefferson Lucas, Hinemaria Ward-Holmes, KASM, Waitakere Ranges

⁹ Corporate Evidence of Alan J Eggers on behalf of TTR.

Protection Society Ltd, Greenpeace New Zealand), raised concerns about the high level of out-of-region (fly-in, fly-out) employees and the low levels of local employment. The Ngāti Ruanui submission sought clarity on the indirect and induced opportunities and where they would occur; and queried the level of commitment to local employment.

69. Based on their business case, TTR is expecting to directly employ 262 employees. Of these, about 60 people will be working in the Whanganui/South Taranaki study area. This increases to 172 when expanded to the Whanganui/Taranaki study area. These jobs are across a number of skill areas. Because of the skill requirement, in the first instance, a large proportion will be employed from outside the study area. Further, TTR will be looking to increase the number of people employed from within the study area over time, as they are able to up-skill local people. How this will occur is discussed in the Proposed Consent Conditions¹⁰ However, all employees working in the study area are likely to spend a portion of their earnings within the study area and many of them may even decide to live in the area.
70. Considering the broader employment generated by TTR activity, the economic impact modelling suggests 299 jobs in the Whanganui/South Taranaki study area, increasing to 705 when looking at the broader Whanganui/Taranaki region. In Whanganui/South Taranaki, the modelling suggests 173 direct jobs and a further 126 indirect and induced jobs, a total of 299 jobs attributable to the project. In the Whanganui/Taranaki study area, there will be 367 direct jobs and a further 338 indirect and induced jobs, a total of 705 jobs.

¹⁰ P 18.

71. There will be other direct jobs outside of the TTR employees as a result of the operations (114 for Whanganui/South Taranaki and 170 for Whanganui/Taranaki). These jobs will be in local businesses contracted to provide engineering, maintenance, supply and transport services to the project. Some of the jobs are outlined in the submission from Kingston Offshore Services.
72. The estimated 126 indirect and induced jobs in Whanganui/South Taranaki, and the 338 in the wider Whanganui/Taranaki region study area, will also be jobs in local businesses and result from increased demand for their services to TTR (indirect) as well as the spending of employees (induced).

Tourism will be undermined

73. A number of submissions (Glenys Ellett, David Olson, Alison Adams-Smith, Annette Andrews, Jefferson Lucas, Hinemaria Ward-Holmes, KASM, Greenpeace New Zealand) suggest that the project will damage the tourist industry either directly by damaging the environment, or indirectly by tarnishing the clean green image of New Zealand.
74. As I have shown in paragraphs 58 to 62, the potential negative impacts in the local study areas, even if they did occur, are unlikely to outweigh the benefits.
75. The argument as to how the project will damage the Country's clean, green image is a difficult one to attribute, or pin to, the TTR project. There are a number of existing businesses and industries currently operating in New Zealand that can potentially have an impact on our clean, green image including the dairy sector, Oil and Gas, and even the tourism sector itself.

Potential negative impacts on tourism, fishing, recreational and environmental values are not well addressed

76. Submissions from KASM, Greenpeace and the Environment and Conservation Organisations Inc (ECO) note that the analysis has not considered negative impacts across a range of areas including tourism, fishing, recreation and environment. There were also submissions from Talley's Group, Fisheries Inshore New Zealand Limited (FINZ), New Zealand Federation of commercial fishermen Ltd (NZFCI) and Southern Inshore Fisheries Management Company Ltd (SIF) questioning the economic effects due to reduced viability of commercial fishing in some areas.
77. My analysis touched on possible negative impacts on tourism and fisheries based on current activity in the study area, the likelihood of potential adverse outcomes, and the possible negative impact of that outcome. However, expert advice¹¹ suggests that impacts on fisheries will be negligible. Even if negative impacts did occur, monitoring and response identified in the proposed consent conditions would quickly contain any likely impact. As such, my analysis has focused on the economic benefits that could accrue from the project.

Economic benefits are overstated

78. A submission from Forest and Bird suggests that that the economic benefits of the project are overstated, particularly when considered in the context of environmental impacts.
79. I have covered the issue of whether the economic benefits have been overstated in my response to the GHD review (paragraphs 38 to 49). I have not attempted to value the environmental impacts (if they did occur) so cannot

¹¹ Expert evidence of Dr Alison MacDiarmid.

comment on the relationship between those and the economic benefits. My analysis is not a BCA and so cannot be overstated in the context of environmental impacts.

Economic viability of the venture

80. A submission by Sea Shepherd New Zealand questions the economic viability of the venture. A submission by David Lilley suggests that the value of the project is 'other' minerals that will be mined such as titanium and vanadium. An assessment of the viability of the venture is discussed in the evidence provided by Mr Alan Eggers.
81. All businesses have the potential to fail. It is for the investor to make an informed assessment on whether the investment meets their risk profile.

Overseas market volatility

82. A submission by Robert Shaw noted the business model of extractive industries and the regional effects of overseas market volatility.
83. In terms of the business model, Mr Shaw argues that the extractive industry model is one where contractors are preferred as are sub-contracting arrangements and, therefore, the volatility risk is transferred. I would argue that this is a business model that is applied in many industries for reasons that go beyond volatility. The approach is mutually acceptable to all the businesses and individuals involved in the engagement.
84. In terms of market volatility, this is a business risk for all export focused businesses that trade in commodities or in global markets. Price volatility is a risk that needs to be managed but is not a reason to not do something. There is also an upside where prices are high.

Validity of the I-O approach

85. Greenpeace and KASM have questioned the ability of an I-O approach to inform decision making on projects such as TTR. Firstly there is concern over a discussion of economic benefits as opposed to net economic benefits through a robust BCA approach. Secondly, the validity of using I-O analysis for large projects was questioned.
86. The I-O approach is different from a BCA approach in that it does not attempt to arrive at a net benefit of a project but rather estimates GDP and employment resulting from a defined level of expenditure. The difficulty with a BCA approach is that there is a need to be able to monetise benefits and costs over a defined time period and then apply an arbitrary discount rate to arrive at a Benefit Cost ratio. This is extremely difficult to do, particularly when costs are difficult to identify, quantify and monetise. While there are approaches for doing this (as noted by KASM), they do not necessarily lend themselves to a BCA model. Ultimately you would end up with only partial analysis with a high level of uncertainty and accuracy, which has its own risks. I also reiterate the comment by GHD included in the EPA Key Issues Report that the Decision Making Committee needs to be particularly conscious of not 'double counting' any 'costs' associated with the environmental effects, particularly as they are considered in sections 59(2)(a) and (b) of the EEZ Act (as well as to a more specific extent in other subsections of section 59).¹²
87. In terms of the 'well-documented problems related to I-O analysis for large projects we have attempted to address this in the analysis.

¹² EPA Key Issues Report, p 29, Paragraph 121.

88. A suggested limitation is that I-O analysis is a static model that doesn't reflect the effect the project will have on other industries through resource allocation or as a result of changes in prices [weakness - fixed prices].
89. I do not expect any material shift in resource allocation as a result of the iron sand project. The project is in a niche area of resource extraction, attracting sophisticated investors who focus on these types of investments globally. It is unlikely that this project will displace investment in other industries in the study areas. Further, with regards to labour and businesses servicing the project, it is likely that some operational activity will be absorbed within existing businesses rather than displacing other activity. This is because I understand that there is currently surplus capacity within the support sectors due to reduced activity in the oil and gas and dairy sectors. Finally, capital investment in the construction phase will largely occur offshore and, therefore, not affect local resource allocations.
90. To address the potential impact of price changes on the project activity, the analysis is based on a fixed level of production. I do not consider the project will be able to influence prices of inputs into the project or outputs (iron ore) and so will not affect other industries' activity. The larger the activity or the more concentrated it is in a single industry or region, the more likely it may influence relative prices. As a relatively large share of inputs, i.e. fuel and labour, will initially come from outside the study areas, there is unlikely to be significant impacts on input prices. As a small player in the global iron ore market, the project is unlikely to impact on iron ore prices.
91. The submissions question the accuracy of the I-O model due to its use of the constant input coefficients. A benefit of using operational expenditure is the ability to break the expenditure down into individual areas and allocate them to the most relevant industry. The analysis allocates expenditure to up to seven industry sectors (at a national level), which improves the accuracy of the results compared to if they were simply lumped into the single industry. Further, the analysis uses actual estimates of direct employment where possible, which also increases the accuracy of the findings.

92. There is the slight possibility that additional demand may push up wages for skilled labour. This was also raised in the submission from Origin Energy New Zealand Ltd¹³.
93. The majority of skilled positions will be sourced globally, and so TTR is unlikely to push wages up significantly in New Zealand. However, I would also question the idea that introducing competition that drives up wage rates is a bad thing. I see this as a positive outcome for the region and for New Zealand.

CONDITIONS

94. Several conditions within the draft consent conditions proposed by TTR will have a positive impact on the study area beyond what has been identified in the economic impact analysis. Effective delivery of these conditions would increase the potential economic impact from the project. In particular:
- (a) TTR will provide an annual fund of \$50,000 per year (inflation adjusted) to be administered by the South Taranaki District Council and TTR. The purpose of the fund is to assist in the establishment of projects for the benefit of the South Taranaki community, in particular for the social and economic wellbeing of the community.
 - (b) Within 12 months of the commencement of the consents, TTR will establish and maintain a training facility located in the township of Hawera. The purpose of the training facility is to provide technical and marine skills based training to prospective trainee process operators and maintenance support staff from the South Taranaki communities who then can be employed by TTR as part of the iron sand extraction activities.

¹³ Section 5.1 p 29.

CONCLUSIONS

95. MartinJenkins analysed the potential economic impacts of the iron sands project on the South Taranaki/Whanganui, Taranaki/Whanganui, and New Zealand economies. The analysis identified the likely annual operational expenditure and direct TTR employment within each study area for the production of 5 million tonnes of iron ore. The analysis then used the TTR operational plan and I-O tables and multipliers to determine the direct, indirect and induced impacts of this expenditure on GDP and employment for each study area.

Economic impact

96. In South Taranaki/Whanganui, the analysis suggests that initial annual expenditure on the iron sands operation of \$35m will generate about \$45m in expenditure and \$19m in GDP, and support a total of 299 jobs each year.
97. Broadening the study area to the Taranaki region and Whanganui, the analysis suggests that initial annual expenditure on the iron sands operation of \$73m will generate about \$116m in expenditure, \$51m in GDP and support a total of 705 full time jobs each year.
98. At a national level, the analysis suggests initial expenditure on the iron sands operation of \$133m will generate about \$349m in expenditure, contributing \$159m to GDP and supporting 1,666 jobs each year.

Royalties and exports

99. The project will also contribute to Government income through royalties and taxes and to New Zealand's export earnings. At a conservative price of US\$40/tonne and a US\$/NZ\$ exchange rate of \$0.65, the project would contribute about \$6.15m in royalties (based on a tier 1 permit) and about \$310m in export earnings each year. Government would also collect taxes from the venture.

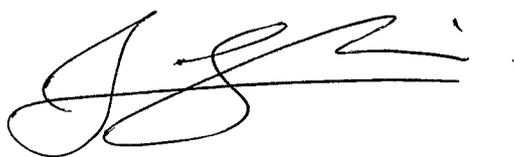
100. Royalties and taxes would increase significantly at higher prices as profits increase and royalties move to accounting profits rather than sales revenue.

Conditions

101. A number of conditions have been proposed that will have a positive impact on the study area beyond what has been identified in the economic impact analysis. Meeting these conditions would increase the potential impact from the project.

Support for the granting of consent

102. Based on the likely benefits to the study areas in terms of jobs, employment, alignment of activity and increased business resilience, I support the granting of consent.

A handwritten signature in black ink, appearing to read 'Jason Leung-Wai', with a horizontal line drawn through the middle of the signature.**Jason Leung-Wai****15 December 2016**