

under: the Fast-track Approvals Act 2024 and Exclusive
Economic Zone and Continental Shelf (Environmental
Effects) Act 2012

in the matter of: an application by Trans-Tasman Resources Limited for
marine consents to support a seabed mining operation
in the South Taranaki Bight

Statement of evidence of **Fraser James Colegrave** (Economics)
for Taranaki Offshore Partnership

Dated: 3 October 2025

Reference:

[REDACTED]
[REDACTED]

STATEMENT OF EVIDENCE OF FRASER JAMES COLEGRAVE FOR TARANAKI OFFSHORE PARTNERSHIP

INTRODUCTION

- 1 My name is Fraser James Colegrave.
- 2 I am an economic consultant and the managing director of Insight Economics, a specialist economic consultancy based in Auckland. I founded Insight Economics in 2013 and have worked there since.
- 3 Prior to founding Insight Economics, I was the founding director of another consultancy, Covec Limited, for 12 years.
- 4 I hold a Bachelor of Commerce (first-class honours) in economics from the University of Auckland. I also received a post-graduate scholarship in economics.
- 5 I have 28 years' commercial experience, the last 25 of which I have worked as an economic consultant. I have successfully completed more than 600 projects across a wider range of sectors and helped gain planning permission for various projects and developments worth more than \$30 billion.
- 6 My main areas of expertise are property development, resource management, economic impact, market supply and demand, and local infrastructure funding. I have undertaken extensive work in these areas for dozens of New Zealand's largest public and private sector organisations.
- 7 Current and recent clients include: Argosy Property, Beach Energy, Calder Stewart, Fletcher Building, Foodstuffs, Fulton Hogan, Harvey Norman, Infinity Group, Kāinga Ora, Kiwi Property, Mike Greer Homes, Millbrook, Neil Group, Ngai Tahu Property, OMV, Sanderson, Skyline, Templeton Group, Tramco, Universal Homes, and Woolworths NZ.
- 8 I have presented expert economic evidence at more than 120 hearings before Councils, Boards of Inquiry, Independent Hearing Panels, the Land Valuation Tribunal, the Environmental Protection Authority (EPA), the Environment Court, the Family Court and the High Court.

CODE OF CONDUCT

- 9 Although these proceedings are not before the Environment Court, I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note (2023), and I agree to comply with it as if these proceedings were before the Court. My qualifications as an expert are set out above. 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 expressed.

SCOPE OF EVIDENCE

- 10 I have been engaged by Taranaki Offshore Partnership (*TOP*) to provide expert economic evidence in relation to the application lodged by Trans-Tasman Resources Limited (*TTRL*) for marine consents under the Fast-track Approvals Act 2024 (*FTAA*) and Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (*EEZ Act*).
- 11 TTRL seeks marine consents to extract 50 million tonnes of seabed material per year, over 20 years, mechanically recover 5 million tonnes of heavy mineral sands concentrates containing iron ore, vanadium and titanium, and return the de-ored material to the seabed (*Proposal*).¹
- 12 To inform my evidence, I have:
 - 12.1 reviewed the documentation outlined below, including the economic impact assessment (*NZIER Report*) prepared by the New Zealand Institute of Economic Research (*NZIER*) dated 12 March 2025, lodged in support of TTRL's application under the FTAA;²
 - 12.2 assessed the methodologies, inputs, and assumptions used in the NZIER Report; and
 - 12.3 compared the estimates in the NZIER Report with the potential economic benefits of an offshore wind farm (*OWF*) in the South Taranaki Bight (*STB*).
- 13 To undertake the assessment of the potential economic benefits of an OWF I have used a recent study by PwC on the potential economic, energy, social, and environmental impacts of a future offshore wind industry in New Zealand (*PwC Report*) as the basis for the economic benefits of an OWF in the STB.³

¹ Available here: <<https://www.epa.govt.nz/database-search/eez-applications/view/EEZ000011>>.

² New Zealand Institute of Economic Research, 'Economic impact assessment of TTRL's Taranaki VTM Iron Sands Project' dated 12 March 2025, available here: <https://www.fasttrack.govt.nz/projects/taranaki-vtm/substantive-application> (*NZIER Report*).

³ PwC, 'National Impact Study: New Zealand Offshore Wind Industry' dated March 2024, available here: <<https://www.pwc.co.nz/pdfs/2024/national-impacts-report-new-zealand-offshore-wind-industry-mar-2024.pdf>>, (*PwC Report*).

- 14 My evidence addresses:
- 14.1 limitations around the assessment of, and conclusions on, the economic impacts of the Proposal stated in TTRL's application, and in particular the NZIER Report, specifically:
 - (a) NZIER's approach, and why it is insufficient to properly assess the Proposal's economic effects; and
 - (b) Other issues with NZIER's Report that cause it to overstate the Proposal's likely economic benefits.
 - 14.2 adverse economic impacts and resulting qualifications or reductions to the economic benefits of the Proposal that are not adequately addressed in the Proposal's application documents and NZIER Report, specifically:
 - (a) Opportunity costs, including the potential displacement of other activities in the STB; and
 - (b) Broader unaccounted costs and potential externalities.
 - 14.3 My conclusions on the Proposal's overall economic impacts.

DOCUMENTATION REVIEWED

- 15 In preparing this statement of evidence, the key documents I have reviewed are:
- 15.1 From the TTRL FTAA application:
 - (a) The parts of the application relevant to economics; and
 - (b) NZIER Report.
 - 15.2 Economic evidence and assessments provided on behalf of TTRL and submitters in relation to TTRL's previous applications to the EPA for the Proposal, including:
 - (a) Statement of Evidence by James Binney on behalf of Kiwis Against Seabed Mining Incorporated (dated 24 January 2017);
 - (b) EPA Information Request, MartinJenkins (dated 28 January 2016);
 - (c) Economic Impact Analysis of Trans-Tasman Resources Offshore Iron Sands Project, MartinJenkins (dated 30 October 2015); and

- (d) Economic Assessment of the Trans-Tasman Resources Ltd Iron Sand Project Modelling Assumptions and Main Results, NZIER (dated August 2013);

15.3 In relation to an OWF in the STB:

- (a) PwC Report;
- (b) Offshore Wind Industry Capability Mapping Study, Concept Consulting (dated October 2023);
- (c) The statements of evidence of Mr James Perry, Mr Regan King and Mr Peter McComb for TOP.

15.4 A Pre-Feasibility Study Presentation that Manuka Resources (TTRL's parent company) released to the Australian Stock Exchange on 23 April 2025.

SUMMARY OF EVIDENCE

- 16 I was engaged to independently peer review NZIER's assessment of the Proposal's likely economic impacts, and to consider the Proposal's overall economic impacts, including any opportunity costs.
- 17 NZIER's analysis uses a static input-output (I-O) model to estimate the Proposal's gross economic impacts. In my opinion, this approach is insufficient for a large, first-of-its-kind, capital-intensive proposal with material supply-side constraints and high delivery risk.
- 18 The NZIER Report also inflates the Proposal's likely economic benefits by including so-called induced effects, which largely cancel out. Omitting them reduces the Proposal's estimated economic impacts on GDP and employment by between 22% and 29%.
- 19 Project deliverability risk is very high, in my view, but this is not captured in the NZIER report. TTRL's challenging financial position, its lack of proven domestic operating capability, and the technical, regulatory, and social-licence hurdles associated with the Proposal materially diminish its likely benefits.
- 20 The NZIER Report's labour market assumptions are also optimistic. The Proposal relies on specialised marine and mining support roles in a region with thin existing capacity; displacement of other activity and wage pressure are likely but are not captured by NZIER.
- 21 In addition, I consider potential opportunity costs to be material. The STB reportedly has world-class OWF potential. On a like-for-like basis, a 1 GW OWF is likely to generate comparable or greater GDP and direct employment as the Proposal, along with substantial

emissions reductions, and enduring enabling infrastructure provision. However, coexistence with seabed mining appears unlikely due to potential spatial conflicts and/or seabed disturbances as discussed in the other evidence presented by TOP.

- 22 Overall, once methodological limitations, delivery risk, and material opportunity costs are accounted for, I do not consider NZIER's analysis of the purported economic benefits to be reliable.
- 23 In fact, in my opinion, NZIER has materially overstated the economic benefits of the Proposal, which I do not consider to be either regionally or nationally significant overall.

PART ONE: ECONOMIC BENEFITS OF THE PROPOSAL

- 24 This part of my evidence examines whether the Proposal is likely to generate the economic benefits estimated in the NZIER Report by reviewing the report's methodology, inputs, and assumptions.

NZIER'S APPROACH

Overview of Methodology

- 25 The NZIER Report adopts a regional I-O approach to estimate the economic effects of the Proposal for three nested study areas: ⁴
 - 25.1 *Local*: South Taranaki and Whanganui district;
 - 25.2 *Regional*: Taranaki Region and Whanganui district; and
 - 25.3 *National*: New Zealand overall.
- 26 Specifically, the analysis applies economic multipliers to the Proposal's New Zealand expenditures and estimated staff counts to assess its effects on output, GDP, and employment. These impacts comprise three parts:
 - 26.1 *Direct impacts*: the direct effects of TTRL's New Zealand spending on output, GDP, and employment;
 - 26.2 *Indirect impacts*: supply-chain impacts arising when firms working directly on the Proposal source goods and services from their suppliers, who in turn may need to source more inputs from their suppliers, and so on; and
 - 26.3 *Induced impacts*: further impacts arising when people employed by the Proposal, directly or indirectly, spend some of their Project wages and salaries in the local economy.

⁴ Comprised of New Plymouth, Stratford and South Taranaki districts.

- 27 In addition, NZIER's analysis estimates future export earnings, annual tax contributions, and royalty payments associated with TTRL's proposed New Zealand operations.

Summary of TTRL/NZIER estimated spending and impacts

- 28 The NZIER Report quantifies both the one-off impacts of establishing the Proposal, and the annual impacts of its future operations.
- 29 According to the NZIER Report, the Project requires a NZD \$1billion investment, 5.5% (\$55m) of which will be spent in New Zealand. NZIER estimated the one-off impacts of this spending, which will be spread across the set-up phase's duration, as:⁵
- 29.1 Full time equivalent jobs for 86, 211, and 459 local, regional, and national worker-years⁶, respectively;⁷ and
- 29.2 Increased local, regional and national GDP of \$9m, \$27m, and \$62m, respectively.
- 30 Once operational, TTRL expects to spend NZD \$238m in New Zealand annually. The corresponding annual economic impacts of that ongoing spending are reproduced in Table 1 below from the NZIER Report.

Table 1: NZIER Annual Economic Impacts of TTRL's Ongoing Operations⁸

Local Impacts	GDP (NZD \$m)	Jobs (FTEs)
Direct	\$19	103
Indirect	\$10	67
Induced	\$8	55
Total	\$37	224
Regional Impacts	GDP (NZD \$m)	Jobs (FTEs)
Direct	\$102	356
Indirect	\$69	434
Induced	\$51	333
Total	\$222	1,123
National Impacts	GDP (NZD \$m)	Jobs (FTEs)
Direct	\$104	359
Indirect	\$96	606
Induced	\$66	400
Total	\$265	1,365

⁵ NZIER Report, Tables 8, 10, & 12 (pp. 12 - 14).

⁶ A worker year is one person working for one year, 2 people working for ½ a year, or 10 people working for 1/10th of a year, etc.

⁷ The local, regional, and national results are not additive; the national impact incorporates the regional impact, which in turn incorporates the local impact.

⁸ Figures transposed from NZIER Report, Tables 9, 11, & 13 (pp. 13 - 14).

WHY AN I-O APPROACH IS INSUFFICIENT FOR ROBUST ANALYSIS OF THE PROPOSAL

- 31 While it is not uncommon for I-O models to be used to assess the economic impacts of “ordinary” projects like (say) a large-scale residential subdivision, in my opinion they are unlikely to be adequate for very large, complex, and first-of-their-kind projects like the Proposal.
- 32 This is especially true if the goal is not simply to quantify gross economic effects, but to assess overall economic impacts once likely Project risks and potential opportunity costs are included.
- 33 While NZIER acknowledges some of the limitations with the I-O approach in their report,⁹ those caveats are easily overlooked when reviewing the Report’s key conclusions, where the Proposal’s positive economic impacts are shown with little (if any) qualification.
- 34 By using a modelling framework that ignores real-world constraints and presenting its gross impacts largely without qualification, I do not consider the NZIER Report to provide a sufficiently robust and reliable basis for evaluating the Proposal’s true economic impacts.

Comparison with a CGE model approach

- 35 Given the limitations of I-O approaches for accurately capturing the overall economic impacts of large and risky projects like the Proposal, I consider more sophisticated methods like Computable General Equilibrium (CGE) models to be more appropriate.
- 36 For example, the Australian Bureau of Statistics (ABS) stated the following when it discontinued the creation of Australian I-O tables:¹⁰

“While I-O multipliers may be useful as summary statistics to assist in understanding the degree to which an industry is integrated into the economy, their inherent shortcomings make them inappropriate for economic impact analysis.... More complex methodologies, such as those inherent in Computable General Equilibrium (CGE) models, are required to overcome these shortcomings.”

⁹ NZIER Report, p. 4.

¹⁰ Australian Bureau of Statistics, ‘Australian System of National Accounts: Concepts, Sources and Methods’, dated 9 July 2021, Chapter 22: Input–Output Tables, para 154. Available here: <<https://www.abs.gov.au/statistics/detailed-methodology-information/concepts-sources-methods/australian-system-national-accounts-concepts-sources-and-methods/2020-21/chapter-22-input-output-tables/using-i-o-tables-analysis>>.

37 Like I-O models, CGE models estimate economic effects via supply-chain interactions. But, they also incorporate various constraints and real-world feedback loops that moderate the estimated economic impacts of large-scale projects like the Proposal. These include:

37.1 *Resource constraints:* CGE models reflect the fact that labour and capital are largely fixed, at least in the short term. Thus, projects that draw heavily on a region's workforce or infrastructure will displace (or "crowd out") activity that would have likely occurred otherwise, which I-O models ignore.

37.2 *Price effects and inflation:* In CGE models, increased demand for goods, services, or labour can push up prices or wages, which in turn has negative feedback effects on economic activity due to dampened demand, and/or wage and price inflation makes the project more expensive to deliver.

37.3 *Substitution effects:* Unlike I-O models, CGE models recognise that businesses and consumers change their behaviour in response to price changes. For instance, if mining-related activity drives up the price of skilled labour or inputs like fuel and engineering services, other industries might scale back operations or switch suppliers.

37.4 *Dynamic feedback loops:* CGE models can be run over time and show how initial impacts ripple through the economy and trigger knock-on effects that an I-O model cannot capture.

38 By explicitly accounting for these real-world constraints and responses, CGE models tend to produce more conservative, but more accurate estimates of a project's likely economic contribution. Accounting for real-world constraints and responses is particularly important for large-scale, regionally concentrated projects, where resource bottlenecks and displacement risks are more likely, and for projects that are unproven from an ongoing technical feasibility perspective.

Appropriateness of I-O vs CGE Modelling for this Proposal

39 Not only does the Proposal's general complexity render it unsuitable for simple modelling approaches like I-O, but its high spatial concentration of proposed future economic activity in specialised industries heightens the risks of capacity constraints arising and muting the Project's overall economic impacts.

- 40 For example, TTRL plan to employ 173 FTEs in the Taranaki and Whanganui Region in "Exploration and other mining support services", 52 of which are in the Local area.¹¹
- 41 However, according to official data, there are currently no local workers in that industry,¹² so the 52 are from a baseline of zero. In addition, the 173 people planned for regional employment within that industry sector represents nearly a 50% increase over the 380 people employed there in 2024.
- 42 Such large spikes in employment demand within very narrow industry categories in relatively small regions will inevitably have complex labour market dynamics that I-O models do not capture. Accordingly, in my view, a CGE model is a much more appropriate basis for assessing the Proposal's economic potential.
- 43 NZIER has itself also previously described CGE modelling as "*a far more objective and conservative estimate of the impact of innovation and technology on the economy than, for example, survey methods, or the common, but simplistic, input-output multiplier analysis*".¹³
- 44 I am therefore surprised that NZIER opted not to use a CGE approach here, especially since they seem to use it regularly,¹⁴ including for earlier applications of this same Proposal.¹⁵ Instead, they adopted a simplistic I-O model for this assessment.
- 45 The decision to do so is not adequately explained despite the Proposal's scale and complexity justifying – in my view – a far more sophisticated approach to the assessment than was provided.

Summary of Comments on Modelling Approach

- 46 In summary, while NZIER's I-O model provides a useful snapshot of potential impacts, it falls short of what I consider necessary to accurately assess the Proposal's likely economic contribution. A

¹¹ NZIER Report, p. 5.

¹² Stats NZ Business Demography Statistics: Geographic units by area (TA and RC) and industry 2000-2024

¹³ New Zealand Institute of Economic Research, Digital Nation: New Zealand – NZIER Report to the New Zealand Technology Industry Association (dated April 2016). Available here: https://www.nzier.org.nz/hubfs/Public%20Publications/Client%20reports/digital_nation_nz.pdf

¹⁴ A quick scan of the publicly available NZIER reports reveals nearly a dozen CGE-based assessments in the past five years alone, and over 20 across the last decade, covering a wide variety of project scales and sectors.

¹⁵ Economic Assessment of the Trans-Tasman Resources Ltd Iron Sand Project Modelling Assumptions and Main Results, New Zealand Institute of Economic Research (dated August 2013).

“first-of-its-kind” seabed mining operation, with untested economic assumptions, calls for a more robust analysis, in my opinion.

- 47 In the absence of such, the I-O-based NZIER Report does not provide a sufficiently robust or reliable basis to test whether the Proposal will deliver the scale of economic benefits suggested.
- 48 While I agree that the Proposal will have some positive economic contributions, the limitations of the NZIER report mean that the true extent of such remains highly uncertain.
- 49 A CGE model, or even just a cost-benefit analysis to supplement the I-O model, would provide a more fulsome and balanced picture of the Proposal’s likely economic impacts. NZIER’s current approach is not in my opinion sufficient to inform the Panel’s assessment of whether the Proposal’s benefits outweigh its adverse effects.
- 50 I note that the various methodological concerns I have raised above are also noted in a detailed economic peer review by Professor Fleming and Mr Buckwell from Griffith University, which I understand will be provided to the Panel as part of the submission from another party. I have read their report and I fully agree with the numerous concerns that they raise from their more technical/academic economic perspective.

ADDITIONAL ISSUES WITH THE NZIER ANALYSIS THAT LEAD TO THE PROPOSAL’S BENEFITS BEING OVERSTATED

Inclusion of induced impacts in I-O model

- 51 In addition to vacating its earlier use of the more nuanced CGE approach to estimate the Proposal’s benefits, NZIER’s I-O approach also overstates economic upside by including induced impacts.
- 52 As noted above, induced impacts capture the additional economic impacts of increased local spending by people employed due to the Proposal, either directly or indirectly.
- 53 While such spending does typically generate economic impacts, much of it would have occurred anyway. This is because many of the people hired by TTRL - particularly those with specialist skills - would likely be employed elsewhere in New Zealand and thus generating the same (or similar) household spending absent the Proposal. Accordingly, induced impacts tend to overstate the likely economic upside of projects.
- 54 Including induced impacts, like NZIER has done here, can also lead to the implausible finding that every dollar spent by a proposal generates more than \$1 of economic benefit (via increased GDP). That is indeed the case here, with NZIER’s analysis estimating that the \$238 million spent annually in New Zealand by TTRL will

generate \$265 million of GDP. In other words, NZIER's analysis suggests that every dollar spent in New Zealand will generate \$1.11 of economic benefit via increased national GDP.

- 55 I consider this extremely unlikely, particularly over the sustained 20-year operating period assumed in the NZIER Report. If one dollar of spending could truly generate more than one dollar of GDP, global economic prosperity could be assured just by spending huge sums and reaping even greater rewards. However, in the real world, capacity constraints and feedback loops (like price inflation) prevent that from happening.
- 56 For context, I note that removing induced impacts from NZIER's analysis reduces the Proposal's estimated economic impacts by 22% to 29% for both the set-up phase, and ongoing operations, with the differences varying by metric and study area – i.e. jobs vs GDP, and local vs regional vs national impacts.¹⁶
- 57 Accordingly, I consider that NZIER's approach has materially overstated the Proposal's likely economic benefits to New Zealand.

Failure to consider project/benefit realisability

- 58 Another issue that the NZIER Report does not adequately address, in my view, is the overall deliverability of the Proposal and hence the likelihood that its purported economic benefits will ever be realised.
- 59 I acknowledge that such considerations normally wouldn't be necessary for 'everyday' development proposals by experienced and financially sound entities with demonstrated track records.
- 60 However, this Proposal is for a very expensive and large-scale mining operation by a relatively small organisation that has not undertaken such activities before, especially not in New Zealand. This, in my view, raises potential organisational capability concerns.
- 61 Moreover, the proposed venture requires a billion-dollar investment, which in turn creates a massive financial hurdle and raises potential doubts about the realisation of its purported benefits.
- 62 In my experience, having worked on dozens of large-scale projects and developments across New Zealand, a project like this is only

¹⁶ For ongoing impacts, this can be deduced from Table 1 above, which reproduced NZIER's estimates of the Proposal's ongoing impacts by component. It shows, for example, that regional employment was estimated to be 1,123 FTEs once the Proposal is fully operational, 333 (29%) of which was induced impacts. Thus, removing induced impacts from the analysis would reduce the Proposal's ongoing regional employment impacts by 29%.

within the realms of the largest and most deeply pocketed organisations.

- 63 I have serious doubts about TTRL's financial capacity to deliver this Proposal based on recent disclosures made by TTRL's parent company, Manuka, on the ASX. They show that:
- 63.1 The company has limited funds, with less than \$1 million of cash on hand as at 1 July 2025, and only \$1.7 million of additional debt funding available under current arrangements.¹⁷
- 63.2 Consequently, according to its latest quarterly cashflow reporting (released July 2025), the company has enough funds to cover only the next 2.8 quarters.¹⁸
- 63.3 Manuka also currently has no revenue-generating activities,¹⁹ and it is reliant on several high-interest loan facilities. For example, the company's second largest debt facility (\$16.7 million) incurs interest at 26% per annum. According to basic finance principles, such high interest rates invariably reflect very high perceived risks of default.
- 64 Manuka's auditors have also expressed concerns about the company's financial health and outlook, as shown in this extract from RSM's independent auditor's review report:²⁰

Material Uncertainty Related to Going Concern

We draw attention to Note 2 in the financial report, which indicates that the Company incurred a net loss of \$8,369,652 during the half year ended 31 December 2024 and, as of that date, the Company's current liabilities exceeded its current assets by \$42,128,800. As stated in Note 2, these events or conditions, along with other matters as set forth in Note 2, indicate that a material uncertainty exists that may cast significant doubt on the Company's ability to continue as a going concern. Our opinion is not modified in respect of this matter.

- 65 Manuka's ailing share price signals that financial markets also doubt the company's ability to successfully deliver the Proposal. Otherwise, its share price would be much higher to reflect future profits generated by the Proposal, which Manuka estimates will boost its earnings (before interest, depreciation etc) by more than US\$300 million per annum.

¹⁷ Manuka Resources Limited, June 2025 Quarterly Activities Report (ASX Announcement, dated 31 July 2025).

¹⁸ Ibid.

¹⁹ I note that Manuka has indicated that it hopes to restart mining soon at its Cobar Basin assets (Mt. Boppy gold and Wonawinta silver projects) and has already raised a small amount of capital towards that goal. However, there is no guarantee that these operations will be profitable enough to sustain the business.

²⁰ <https://www.aspecthuntley.com.au/asxdata/20250314/pdf/02925193.pdf>

- 66 Instead, despite a short-lived rally upon listing in July 2020, Manuka's share price has declined steadily ever since. As a result, the current share price of 3.5 cents (on 18 September 2025) is:²¹
- 66.1 86% below the opening price of 25 cents five years ago; and
- 66.2 95% below the all-time high of 71 cents in August 2020.
- 67 This share price attrition also means that Manuka's current value (i.e., its market capitalisation) is less than AUD\$33 million.
- 68 In other words, Manuka is currently worth about 3% of the Proposal's estimated total outlay of NZD\$1 billion, and its current cash balances are less than 0.1% of that amount.
- 69 As a result, more than 99% of the Proposal's initial outlays would need to be funded via new debt or investment for it to proceed and to realise the economic benefits estimated by NZIER.
- 70 While it is theoretically possible for Manuka to seek such investment from third parties, I consider any prospective investors to be extremely cautious given the sums involved and the circumstances just described.
- 71 Accordingly, I do not consider the NZIER Report to adequately reflect the degree of uncertainty associated with TTRL delivering the Proposal and realising its estimated economic benefits. This uncertainty could have been addressed in the NZIER Report through clearer caveats or sensitivity analysis around financing and delivery risks. Without such treatment, the estimates present an overly certain view of outcomes that are in fact highly contingent.

First-of-its-Kind Operation and Associated Uncertainty

- 72 The Proposal would be a first-of-its-kind offshore seabed mining operation in New Zealand, with no proven commercial precedent in New Zealand waters. This brings several uncertainties:
- 72.1 *Technical feasibility:* The Proposal involves deploying integrated mining and slurry return systems that are untested at scale in New Zealand. This includes operating in a dynamic offshore environment with high sediment loads and complex marine logistics. The lack of prior operational testing raises uncertainty around system performance, maintenance requirements, and the ability to achieve consistent recovery rates. Any technical underperformance could result in lower-than-expected production volumes, higher operating costs, or

²¹ See, for example, <https://www.asx.com.au/markets/company/MKR>.

unplanned downtime - all of which would reduce the economic impacts projected in the modelling.

72.2 *Regulatory risk*: Key aspects of the operation - such as environmental monitoring, sediment plume modelling, and ongoing ecological monitoring and management - are subject to conditions being met post-consent, rather than proven outcomes. This means the ability to sustain operations at projected output levels depends on meeting ongoing environmental thresholds, which introduces material uncertainty around the continuity, scale, and cost of production - not to mention the broader uncertainty surrounding the full extent of environmental impacts themselves.

72.3 *Market perception*: As a new and controversial extractive industry, offshore seabed mining faces scrutiny from stakeholders, including iwi, environmental groups, and the broader public. A tenuous social license could lead to reputational risks, legal challenge, or political pressure - any of which could disrupt operations, deter investment or sales, or constrain growth. While these impacts may not eventuate, they have the potential to affect economic returns by increasing costs, delaying activities, or limiting market access, and therefore should be considered alongside the broader question of the Proposal's feasibility discussed above.

73 The NZIER Report does not account for the elevated uncertainty or potential for underperformance or disruption associated with an unfamiliar project. By using a deterministic, high-certainty modelling approach, it presents economic impacts with a degree of confidence that may not be warranted, in my view.

74 Given the Proposal's novel nature and the multiple layers of uncertainty outlined above, the economic impact estimated presented in the NZIER Report should be treated with caution. Best practice for assessing new or untested activities typically involves applying explicit discount factors or scenario testing to reflect technical, regulatory, and market risk. The absence of any such adjustments in NZIER's modelling means the reported economic benefits likely overstate the Proposal's realisable contribution.

Issues with inputs and assumptions

75 The NZIER Report relies on several highly variable inputs to estimate the Proposal's economic and fiscal impacts, including iron ore prices, fuel costs, and exchange rates. While the NZIER Report includes some sensitivity analysis on these variables, it still:

75.1 assumes fixed annual production volumes at full capacity from day one;

- 75.2 does not model the GDP or job impacts of scenarios with sustained or even intermittent price or cost shocks; and
 - 75.3 excludes several other material risks such as variation in shipping costs or equipment downtime.
- 76 Given the historical volatility of commodity markets and the long project duration (20 years), this static approach understates uncertainty and overstates confidence in the forecasted benefits.
- 77 For example, NZIER's estimates of operational spending, and therefore its annual contributions to GDP and employment, are anchored to a single production scenario (of 4.9 million tonnes of iron ore concentrate per annum).
- 78 Thus, despite doing sensitivity testing for variables that do not affect its GDP or employment estimates - like commodity prices, exchange rates, and fuel costs - the NZIER Report holds the most important variable (annual production levels) constant.
- 79 In addition, NZIER assume that the Proposal achieves full production from day one. However, I understand that dredge mining operations of this scale typically require a staged ramp-up over several years, and occasional outages are normal. Consequently, early-year revenues, and therefore tax and royalty contributions, are likely to be overstated in the NZIER Report.
- 80 More generally, TTRL's application notes a 3–4 year lead-in before extraction begins (1 year for a bankable feasibility study and 2–3 years for construction, commissioning, environmental monitoring, etc.).²² This means that, in reality, any economic contributions will lag the granting of consent by several years. This reduces the near-term value of benefits and introduces risk, such as:
- 80.1 commodity prices shifting significantly;
 - 80.2 market conditions for iron ore becoming less favourable (including reduced demand, for example related to the transition toward low emissions steel through increased steel production from recycled scrap steel); and
 - 80.3 competing projects or technologies (e.g., the emergence of green hydrogen steelmaking, which typically requires higher-grade iron ore than what would be extracted by the Proposal) reshaping market dynamics.

²² Application, p. iii.

- 81 These risks have not been discussed or modelled in the NZIER Report, despite their relevance to long-term revenue, GDP, and job projections.
- 82 International shipping is typically a major cost driver for resource-exporting projects, especially offshore operations like the Proposal requiring trans-shipment and long-distance delivery. While the NZIER Report outlines TTRL's offshore logistics - including Integrated Mining Vessels, Floating Storage and Offloading units, and supporting tug and survey vessels - it does not provide a dedicated analysis of freight or shipping costs, nor their potential volatility.
- 83 These costs are likely captured within the portion of operating expenses that NZIER notes occur outside New Zealand and are therefore excluded from the economic modelling. Yet shipping costs have the potential to affect the Proposal's profitability and, in turn, the taxable base, local reinvestment, and so on. If freight rates rise above assumed levels (due to global shipping constraints, fuel surcharges, or geopolitical disruptions), TTRL's margins could be squeezed, reducing its capacity to sustain regional spending at the levels assumed, thereby diminishing expected flow-on economic activity.
- 84 A recent peer review of the Proposal's assumptions by Sanofex Group²³ (the *Sanofex report*) also identified many issues that seriously compromise the Proposal's financial viability and thus the likelihood of attracting the funding necessary to proceed.
- 85 Specifically, according to the Sanofex report, the figures used by NZIER to calculate the Proposal's economic impacts are unreliable. First, they significantly overstate likely future revenues because:
- 85.1 The product's water content - i.e. from seabed mining - inflates its dry weight by about 10%, but TTRL supposedly do not adjust for this in their revenue calculations.
- 85.2 In addition, iron ore prices do not reflect quality penalties of approximately 35% to 40%, which the Sanofex report says are not applied.
- 85.3 At the same time, TTRL assume constant 24/7 production at full capacity, while ignoring (amongst other things) the effects of tide windows and weather conditions on operating capacity.
- 85.4 Finally, vanadium revenues are highly uncertain due to implied low recovery rates, the lack of an apparent "offtake",

²³ Sanofex Group, Internal Report on Trans-Tasman Resources Limited Application for Fast Track Act Expert Panel, dated 12 August 2025.

and the need for an onshore capital investment of circa US\$400m. This evidently extinguishes the financial viability of vanadium as a separate revenue stream.

- 86 Second, the Sanofex report concludes that the Proposal's estimated costs are also too low because:
- 86.1 Freight of US\$10/tonne is more likely to be US\$15-20/tonne, i.e. 50% to 100% higher;
 - 86.2 The IMV used for daily operations far exceeds Port Taranaki's berth and draft constraints, so additional dredging would be required to enable its use; and
 - 86.3 No allowance has been made for the operational or capital requirements associated with vanadium extraction.
- 87 Coupled with the revenue issues identified in the Sanofex report, these cost increases and technical challenges undermine the Proposal's financial viability, and hence its ability to secure the necessary funding. In fact, according to calculations contained in the Sanofex report, the Proposal would have a negative internal rate of return (*IRR*) when more realistic cost and revenue assumptions are used. In other words, the Proposal would not generate enough revenue to cover its own expenses once finance costs are included.
- 88 While I am unable to validate the numerous criticisms levelled at the Proposal in the Sanofex report, if they are true, the Proposal has almost no chance of occurring due to ailing financial viability.
- 89 Overall, I consider the inputs and assumptions used by NZIER to be unreliable. Amongst other things, they mask significant likely variation in operating volumes – and thus the Proposal's annual economic impacts – while failing to acknowledge several looming threats to the Proposal's likelihood of proceeding in the first place.

Workforce availability and skills

Skilled Workforce Requirements

- 90 The Proposal involves highly specialised marine, technical, and engineering roles, including vessel operators, mechanical staff, and environmental monitoring personnel. While TTRL's 2015 application projected that approximately 27% of staff would come from outside the region (i.e., elsewhere in New Zealand), plus an additional 30 specialised staff from overseas,²⁴ the NZIER Report assumes all

²⁴ EPA Information Request, MartinJenkins (dated 28 January 2016), Table 2 (p. 1).

roles will be filled within the region.²⁵ This material change in assumptions is not addressed or justified in the NZIER Report.

- 91 If the regional labour market lacks the required skills for the Proposal, TTRL may need to revert to national or offshore recruitment, reducing the localised or nationalised economic benefits outlined in the NZIER Report.
- 92 Furthermore, no analysis is provided of the feasibility or timeframes required to develop these skills through local training or education pipelines. The potential for wage inflation, recruitment delays, or labour market friction is not considered - despite these being common features of projects requiring niche or highly skilled labour.
- 93 *Assumptions on Labour Market Capacity*
NZIER's modelling implicitly assumes that the required workforce can be absorbed without placing pressure on local wages or displacing workers from other sectors. While this reflects the assumptions built into I-O modelling, which treat labour (and other resources) as infinitely elastic at current prices, in reality, regional labour markets - especially for specialised marine and technical roles - are often tight.
- 94 Increased demand for scarce workers could drive up wages, create competition with existing industries, or lead to redistribution rather than net gains in employment.
- 95 These dynamics are not addressed in the NZIER Report, even though they have the potential to materially affect both the scale and distribution of economic impacts at the local level, meaning TTRL's conclusions are potentially overstated, as they do not account for the risk of labour market constraints.

CONCLUSION ON NZIER'S ASSESSMENT

- 96 Given the issues outlined above, I consider the NZIER Report to provide an unreliable basis for assessing the Proposal's likely economic impacts. In my view, it materially overstates the likely economic benefits of the Proposal.

PART TWO: POTENTIAL ADVERSE ECONOMIC IMPACTS OF THE PROPOSAL

- 97 This part of my evidence examines the broader economic impacts of the Proposal that are not addressed in NZIER's analysis, but which are vital for assessing the Proposal's likely overall economic contribution, including informing the Panel's consideration of

²⁵ NZIER Report, p. 4.

whether any adverse impacts are disproportionate to its purported benefits.

OPPORTUNITY COSTS: OFFSHORE WIND

The Potential for Offshore Wind in South Taranaki

- 98 As explained in the evidence of Mr Caleffi for TOP, the STB is widely recognised as one of New Zealand's most promising locations for offshore wind generation.²⁶ With consistently high wind speeds and relatively shallow seabed depths near the coast, it has been described as possessing world-class potential.²⁷
- 99 In 2024, PwC released a comprehensive report on the national economic impacts of several potential development pathways for offshore wind in New Zealand. It adopted a strategic assessment framework to assess potential impacts across four key themes: the economy, energy system, environment, and people.
- 100 PwC's "Electrification" scenario - the most conservative of the three scenarios modelled in terms of economic impacts - assumes two 1-GW OWFs will be developed by 2050, one in the STB, and one off the Waikato coast.
- 101 To examine the potential economic impacts of a 1-GW development in the STB, I halved the estimated economic impacts of the electrification scenario in the PwC Report just described. The results suggested that the impacts of a 1-GW OWF in the STB could be:
- 101.1 Annual electricity generation to power 550,000 homes;²⁸
- 101.2 A GDP contribution of \$5.8 billion over the project's life;²⁹
- 101.3 Employment for 16,770 FTEs over the life of the project (direct, indirect, and induced);³⁰

²⁶ This is also noted in the PwC Report. See, for example, p. 25.

²⁷ A 'superb' wind resource is considered to have speeds above 8.5 m/s (PwC Report, p. 25).

²⁸ Figure derived from Figure 9 (p. 11) of the PwC Report based on an average household electricity consumption of 8,000 kWh/year.

²⁹ Figure derived from Table 7 (p. 38), PwC Report.

³⁰ Employment estimates for the OWF project are drawn from Concept Consulting's offshore wind industry capability mapping study [Offshore Wind Industry Capability Mapping Study, Concept Consulting (dated October 2023)], which models a 1 GW offshore wind development in the STB. These figures differ from those in the PwC report but are considered to be more conservative.

101.4 Domestic expenditure of \$5.39 billion over the life of the project;³¹ and

101.5 Carbon abatement of 2.85 MtCO₂-eq per annum by 2050.³²

- 102 As noted by PWC, these economic, social, and environmental benefits highlight the STB's strategic importance for New Zealand's decarbonisation agenda and for its *just transition* to a decarbonised economy.

TTRL's Proposal and Offshore Wind would likely conflict

- 103 Despite the potential for, and merits of, a future OWF in the STB, I understand that TTRL's Proposal would spatially conflict with a OWF, making OWFs more difficult and expensive to establish in the STB. As a result, the Proposal could displace an OWF that may have otherwise established in that location.

- 104 Specifically, expert evidence on behalf of TOP notes that:

104.1 TTRL's Proposal will have direct impacts on seabed morphology, creating pits and mounds, that will persist for a significant length of time or be near-permanent. These changes to seabed morphology will have flow on impacts for waves and currents. The pits and mounds will also migrate beyond TTRL's Proposal area, with uncertainty over the extent of migration;

104.2 TTRL's Proposal will have direct impacts on the geotechnical characteristics of the seabed – reducing the strength of the seabed, increasing the potential for settlement, and increasing susceptibility to liquefaction and slope failure and settlement under seismic conditions;

104.3 These impacts on the environment will mean that an offshore wind farm within the same area will be either technically impossible or commercially non-viable. Even outside the area directly impacted by TTRL's Proposal the effects (and their extent) are highly uncertain, and will therefore substantially increase the costs of investigating and developing an offshore windfarm, increase technical design risk and create high levels of uncertainty around financial investment.

- 105 The evidence demonstrates that the challenges posed by the Proposal in this regard are sufficiently significant that they represent a genuine opportunity cost; in other words, allowing seabed mining to occur may preclude OWF in the STB for at least the duration of

³¹ Figure derived from Table 7 (p. 38), PwC Report

³² Ibid.

the Proposal's activities, or potentially on a permanent basis if the Proposal creates seabed conditions that are unsuitable for offshore wind development in locations otherwise most suitable for OWF projects.

- 106 Consequently, the potential loss of, impairment, or delay in realising the economic benefits of OWF is a direct adverse economic effect of the Proposal, so the scale of that opportunity cost must be assessed.

Comparison: Benefits of TTRL Proposal vs OWF in the STB

- 107 This potential conflict between the Proposal and OWF raises the issue of whether the Proposal's economic benefits are enough to outweigh and justify potential opportunity costs via the foregone economic benefits of OWF.
- 108 It is important to note, however, that some of the uncertainties identified earlier in my evidence in relation to the Proposal's benefits - such as financing, consenting, and delivery risks - are also relevant to OWF. The key difference is that OWF enjoys successive statements of support from Government as part of New Zealand's decarbonisation and energy security strategy,³³ while seabed mining does not (aside from recent expressions of support by the Minister for Resources).
- 109 Against this backdrop, and to address the question posed, I compared the estimated economic impacts of the Proposal (via the NZIER Report) with a 1 GW OWF in the STB (using the PWC Report plus employment estimates from Concept Consulting's offshore wind study³⁴). The OWF project is assumed to span approximately 40 years, comprising 4 years of feasibility and planning, 4 years of construction, 30 years of operation, and 2 years of decommissioning.³⁵
- 110 In contrast, the Proposal is modelled over a 20-year operational window to match its description in the Fast-track Approval application, with the one-off impacts of its start-up phase added to yield the Proposal's total economic contribution.
- 111 Table 2 summarises the projected total economic impacts of the Proposal and a 1-GW OWF over their respective project lifetimes. I note that the NZIER Report and the PwC analysis both use an I-O modelling framework, which, as I have previously discussed, has

³³ Such as the Offshore Renewable Energy Bill. Additional information available here: www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-generation-and-markets/offshore-renewable-energy

³⁴ Offshore Wind Industry Capability Mapping Study, Concept Consulting (dated October 2023).

³⁵ Figures derived from Figure 39 (p. 40), PwC Report.

material limitations and tends to overstate net economic benefits. Nevertheless, because both studies adopt the same type of model, these caveats apply to both sets of results, so the comparison remains instructive: it provides a like-for-like benchmark of relative economic contributions, even if the absolute values are too high.

Table 2: Projected Lifetime Impacts: TTRL Proposal vs 1 GW OWF

Metric	TTRL Proposal	1 GW Offshore Wind Farm
GDP: Direct impacts	\$2.1B	\$2.5B
GDP: Total impacts	\$5.4B	\$5.8B
FTEs: Direct impacts	7,400 FTEs	9,030 FTEs
FTEs: Total impacts	27,770 FTEs	16,770 FTEs
Carbon Emissions Impact	Increased emissions from mining ³⁶ and exporting	Reduction ³⁷ by 58.5 MtCO ₂ -e
Infrastructure Legacy	Minimal	Ports, electricity grid, hydrogen
Future Industries Enabled	Limited; largely extractive	Hydrogen, e-fuels, green export industries

- 112 While the two sets of figures may reflect some methodological differences that limit direct comparability, I consider this table to still provide a useful starting point for assessing the proportionality of the Proposal's benefits versus its opportunity cost from the loss of potential future OWFs in the STB.
- 113 Amongst other things, this basic comparison shows that OWF would likely generate more GDP, and more direct employment than the Proposal, but less employment overall. The latter is due to the inordinately high multiplier used by NZIER to translate direct employment to totals, the reliability of which I doubt.
- 114 In addition, this comparison shows that OWF will deliver significant reductions in carbon emissions, while the Proposal will increase them. At the same time, OWF is likely to enable future industries to establish and support a just transition, while the Proposal does not.
- 115 Overall, I consider this comparison to demonstrate that OWF is likely to be a superior economic outcome overall, particularly when broader factors like emissions impacts are included. While it is theoretically possible that both projects could proceed in separate spatial areas, as discussed in the previous section, the uncertainty

³⁶ NZIER notes that the Proposal will use 7,000 tonnes of intermediate fuel (IFO380) per month. Over the course of a year, that equates to more than 260,000 tonnes of CO₂ emissions: CO₂ emissions are estimated using a standard emission factor of 3.114 tonnes of CO₂ per tonne of IFO 380 burned, based on data from the Intergovernmental Panel on Climate Change and the International Maritime Organisation. Once the diesel required to freight mined products overseas is included, the Proposal's overall carbon emissions are even higher.

³⁷ The PwC Report's emissions reduction figures are based on life cycle analysis, which includes embodied carbon from construction, as well as operations and maintenance. Additionally, offshore wind has a short carbon payback period of 5–12 months, negligible relative to its 30-year operating life.

arising from the seabed mining activity makes coexistence unlikely. In that context, I consider the opportunity cost of foregone offshore wind to be material, such that the Proposal's economic benefits should not be regarded as regionally or nationally significant.

BROADER OPPORTUNITY COSTS: ENERGY TRANSITION & GREEN INDUSTRY

- 116 If the Proposal is granted and partly or wholly displaces an OWF that would have otherwise established in the STB, it could also jeopardise broader policy goals. These include:

116.1 *Climate Commitments*: Offshore wind is a key option to scaling electrification to support the electrification of energy demands that are currently met through fossil fuels, as well as supporting sectors that may enable replacement of fossil fuels (like green hydrogen).

116.2 *Industrial Strategy*: OWF could unlock new green exports - such as e-fuels or green ammonia - while seabed mining, by contrast, involves offshore extraction with minimal domestic processing or manufacturing, and therefore offers more limited spillovers to other sectors of the economy.

116.3 *Just Transition*: While both the Proposal and offshore wind offer pathways to re-employ and re-train the offshore oil and gas workforce in Taranaki, offshore wind aligns more directly with long-term climate and energy strategies.

- 117 If the Proposal proceeds and precludes offshore wind development in the STB, New Zealand may lose a key decarbonisation option and incur higher costs associated with decarbonisation commitments, delay investment in key enabling infrastructure, and lose potential first-mover advantages in emerging green technologies.
- 118 In sum, the Proposal poses significant opportunity costs by potentially locking out a high-value, long-term, and future-aligned alternative use of the STB. While TTRL offers short- to medium-term export revenues, offshore wind presents a strategic investment in national resilience, economic transformation, and climate action, in addition to economic benefits similar to those of the Proposal.

IMPACTS ON OTHER SECTORS AND FUTURE ECONOMIC OPPORTUNITIES IN THE STB

- 119 The NZIER Report also does not consider the Proposal's potential negative impacts on existing or emerging marine-based sectors, nor does it address how the Proposal may constrain or preclude future higher-value economic activity within the STB. While I do not assess these wider sectoral impacts, which I understand will be addressed

by other submitters, I consider it is feasible and appropriate to assess these types of impacts here.

- 120 By way of example, recent national-scale economic assessments of offshore renewable energy projects, such as the PwC Report, have explicitly acknowledged the cross-sectoral consequences of large-scale marine developments. PwC's evaluation of the future of offshore wind identifies a wide array of other sectors likely to be affected by offshore wind development, including:³⁸

120.1 commercial fishing and aquaculture;

120.2 tourism and recreation;

120.3 maritime transport and port services;

120.4 environmental science and oceanic research;

120.5 defence, education, and regional infrastructure; and

120.6 seabed mining.

- 121 Even where the primary focus of development is clean energy, the PwC Report notes the need for careful spatial planning and policy coordination to avoid harmful interference with other economic uses of the marine environment.

- 122 In addition, it notes that industries such as offshore aquaculture, marine tourism, and recreational fishing may also be indirectly affected by the increased turbidity, sediment plumes, or perceived industrialisation of the marine space.

- 123 These sectors, while smaller in scale than the Proposal, contribute to regional economic resilience and community wellbeing. Their exclusion from any quantitative consideration within NZIER's analysis means that the benefit to New Zealand is likely overstated, as these offsetting costs remain unmeasured and unacknowledged.

- 124 Finally, while the FTAA does not explicitly require projects to deliver wider scientific or public-good benefits, I understand that such benefits - and any opportunity cost arising from the loss thereof - are relevant when considering the regional and national benefits that the FTAA seeks to promote.

- 125 While the Proposal includes both pre-operational and post-extraction marine monitoring, these efforts are largely framed around regulatory compliance - ensuring sediment discharges, underwater noise, and ecological disturbances remain within agreed limits. By

³⁸ PwC Report, p. 47.

contrast, according to the PwC Report, emerging marine industries such as offshore wind are anticipated to contribute to broader-scale environmental research, long-term data collection, and hazard-response capabilities.³⁹ This reflects the global experience of offshore wind as a strategic energy and infrastructure sector, where projects are often integrated with wider scientific and monitoring initiatives, not solely compliance-driven activities, underscoring the importance of considering not only environmental protection but also the potential reduction in future public-good uses of the STB.

- 126 In summary, in my opinion, any economic analysis of large-scale marine developments must not only consider project benefits, but also adverse economic effects like the opportunity costs of other potential uses of the STB foregone, especially those aligned with New Zealand's long-term economic and climate-change goals.

CONCLUSIONS

- 127 In my opinion, the NZIER report provides an optimistic, gross-impact view that is not fit for a decision of this scale and complexity. A more suitable framework (like a CGE and/or cost-benefit analysis) would help moderate the results by recognising capacity constraints, price effects, substitution, and risk.
- 128 Just removing induced effects reduces the Proposal's estimated GDP and job impacts materially. When delivery risk and labour-market constraints are acknowledged, the realisability of the Proposal's estimated benefits becomes highly unclear.
- 129 The Proposal also carries substantial opportunity costs by likely foreclosing or delaying offshore wind in the STB, which offers larger strategic and emissions benefits and stronger long-term regional development prospects.
- 130 On balance, I do not consider the economic benefits of the Proposal to be regionally or nationally significant, particularly when delivery risks, adverse effects, and opportunity costs are included.

Fraser Colegrave
3 October 2025

³⁹ PwC Report, p. 47.