Before an Expert Panel **Bendigo-Ophir Gold Project**	**FTAA-2507-1089**
Under the	Fast Track Approvals Act 2024
In the matter of	an application for approvals to establish, operate, and remediate an open pit and underground gold mine at Bendigo and Ardgour Stations
By	**Matakanui Gold Limited** Applicant

STATEMENT OF EVIDENCE OF DR WILLIAM HENRY KAYE-BLAKE
ECONOMICS

10 April 2026

Environmental Defence Society Inc
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Table of Contents

Introduction

1. My name is Dr William Henry Kaye-Blake.

2. I am a Principal Economist employed by the NZ Institute of Economic Research Incorporated (NZIER).

3. I have been asked by the Environmental Defence Society (EDS) to independently review economic matters related to the Bendigo-Ophir Gold Project (BOGP).

Qualifications and experience

4. My qualifications include a PhD in Economics from Lincoln University, which I obtained in 2006. My Master's degree (University of California, Davis) and Bachelor's degree (College of William and Mary in Virginia) both involved interdisciplinary study in the social sciences, including economics, government, anthropology and sociology.

5. Prior to my current role, I was a Director and later Chief Economist at PricewaterhouseCoopers (PwC NZ) in Wellington from 2014 until 2019. I was a Principal Economist at NZIER from 2010 until 2014. Alongside these positions, I was an Honorary Associate Professor at Lincoln University between 2010 - 2024, after having worked at Lincoln University from 2002 until 2010.

6. From 2020 to 2024, my main work was Theme Leader and member of the Science Leadership Group for the Our Land and Water Toitū te Whenua, Toiora te Wai National Science Challenge, where I commissioned, managed, and peer-reviewed a suite of research projects about the economics of improving water quality while maintaining the financial viability of farming.

7. I have been undertaking economic research for approximately 30 years. I have worked in New Zealand, the United States, Australia and China. My areas of expertise include modelling economic impacts, the primary sector, technological innovation, consumer behaviour, and rural community resilience.

8. Outside of employment I have also held volunteer roles, including as President of the New Zealand Association of Economists, which I held from 2013 to 2015.

9. I have also authored and / or co-authored many publications regarding different aspects of economics. I have published 40 peer-reviewed journal articles. In 2019,

I helped write and edit a book on rural community resilience, entitled *Heartland Strong: How rural New Zealand can change and thrive*. My published work covers non-market valuation, decision-making, international trade, environmental economics, technological innovation, food consumption, computer modelling and more.

10. My technical skills and experience directly relevant to this statement include:

    a. Conducting cost-benefit analysis for business and government, including the Ministry for Primary Industries, Pipfruit New Zealand, and Beef + Lamb New Zealand;

    b. Conducting computable general equilibrium modelling for business and government, including the Ministry for Primary Industries and New Zealand King Salmon;

    c. Conducting cost-benefit analysis and economic modelling in the context of applications under the Resource Management Act 1991 (RMA). I have produced economic evidence for the Environmental Protection Authority, New Zealand King Salmon, and Trans-Tasman Resources Ltd.; and

    d. Conducting economic analysis for applications under the Fast-track Approvals Act 2024 (FTAA), including computable general equilibrium modelling and multiplier analysis.

Code of Conduct

11. I have read the Environment Court's Code of Conduct for Expert Witnesses contained in the Court's Practice Note of 2023. I agree to comply with it. I confirm that the issues addressed in this brief of evidence are within my area of expertise, except where I state I am relying on what I have been told by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Material considered and site visit

12. In preparing this evidence the principal documents I have reviewed are:

    a. Economic impacts of the Bendigo-Ophir Gold Project – October 2025 update, Benje Patterson.

b. Memo – Economic impacts Bendigo-Ophir Gold Project updated for June 2025 PFS, by Benje Patterson, August 2025.
c. Bendigo-Ophir Gold Project Update Pre-feasibility Study (PFS), 1 July 2025.
d. Bendigo-Ophir Gold Project socio-economic baseline assessment by Rationale, 3 May 2024.
e. Aspects of the application's Assessment of Environmental Effects (AEE) relevant to my area of expertise and to understanding environmental and social impacts.

13. I also refer throughout my evidence to economic literature, as footnoted and referenced.

14. I attended a site visit hosted by Santana Minerals Ltd in March 2026 and am generally familiar with the BOGP site.

15. In preparing this evidence, I am aware that the Panel has issued requests for further information (RFI) from the applicant (dated 19 March and 1 April 2026), several of which are relevant to my area of expertise. My evidence has been prepared in advance of the applicant's responses being provided to the Panel and parties, including EDS.

16. As a result, I wish to reserve my ability to update my evidence in light of the additional information provided by the applicant to these RFIs, where material and relevant to my expertise. In addition, I understand that proposed consent conditions may evolve during the fast-track process, and I request an opportunity to comment on material changes to these, again where relevant to my area of technical expertise.

Scope of evidence

17. This evidence addresses:

a. The regulatory context for this statement.
b. Economic tools for project assessment.
c. Project economics.
d. Assessment of the Benje Patterson report.
e. Environmental impacts.
f. Social impacts.
g. Bonds and risk.
h. Comments on selected documents.

Regulatory context

18. The purpose of the FTAA is to facilitate projects with significant regional or national benefits (section 3). "Benefits" are not *per se* defined in the FTAA, other than in comparative terms.

19. When making its decision on a project, a panel must assess the extent of a project's regional or national benefits (section 81(4)). A panel may decline an approval if its adverse impacts are sufficiently significant to be out of proportion to the project's regional or national benefits (after taking into account proposed conditions, including volunteered modifications or conditions).

20. It is my understanding from Counsel that the FTAA does not substantively change the information requirements under the RMA. That is, an application that needs RMA approval can use the FTAA process, but it must still include all the same information as an application using the RMA process.

21. This evidence seeks to assist the Panel in its assessment of the extent of the BOGP's regional or national benefits. In doing so, I have undertaken an economic review of the application, as I would have done for an RMA consent application.

22. The language from the FTAA and RMA leads economists to organise their assessments by economic, environmental, social and cultural impacts and to consider impacts over time. It also leads economists to consider both benefits and costs.

Summary of findings

23. I have reviewed the information in the BOGP application and assessed it from an economic perspective. I found the following:

    a. The Benje Patterson report is not a cost-benefit analysis (CBA).

    b. The economic figures are not discounted. Following standard discounting practice reduces the Gross Domestic Product (GDP) impact from $5.8 billion to $3.3 billion GDP impact.

    c. The calculation of gross economic impacts appears to be a standard multiplier analysis, but is insufficient to allow for peer review or independent assessment.

d. Information on the dollar value of impacts on the Central Otago District, Queenstown-Lakes District and Otago Region is lacking.

e. The method (multiplier analysis) is not a good tool for understanding economic impacts in an economy without spare productive capacity, like Central Otago.

f. The Benje Patterson report acknowledges that the BOGP's economic impact is an upper limit and does not indicate what the expected economic impact (or central estimate) would be.

g. The dollar value of the impacts that I have measured raises questions about the net benefit of the project for the local area. I have not included all the impacts, and yet the negative impacts could be roughly the same magnitude as the benefits. The reasons are that most of the economic benefits go elsewhere, while most of the costs are localised.

h. The material provided does not provide enough information about both likely and unlikely outcomes. This lack of information is relevant for a sensitivity analysis, which should be conducted to understand the range of potential economic impacts. It is also relevant for developing an appropriate bond or other mechanism, which should have sufficient value and permanence to deal with a range of potential adverse impacts.

i. There has been no attempt at assigning economic values to the many environmental, amenity, social, and heritage impacts. There are methods for making such estimates, and that information would be useful for the Panel.

24. In my opinion, the information and analysis in the application are insufficient to demonstrate a compelling economic case for the BOGP. I suggest that a full cost-benefit analysis is warranted due to questions raised during my assessment of the available information. While there are claims of large economic benefits, my analysis suggests that the net benefit for the local area could be small or even negative.

25. At the regional level, the net economic benefit may not be significant or could be negative, because most of the costs are localised while most of the benefits accrue

outside the region, and the regional economic displacement has not been considered and is likely to be material.

26. At the national level, the economic value of unconsidered costs, such as biodiversity loss and lost amenity value, may be large enough to outweigh gross economic benefits.

Economic tools for project assessment

27. My prior work includes non-market valuation, economic analysis of environmental and social impacts, and research on wellbeing and resilience. It also includes economic analysis for RMA applications. As a result, I have a wide view of the uses of economic analysis and the importance of non-market impacts.

28. The Benje Patterson report is not a CBA. It is a calculation of gross economic impacts, which is one element for assessing the net economic benefit of a project. Whether an economic impact assessment (EIA) is sufficient will depend on the project and its location. For BOGP, I consider that the known negative impacts of the BOGP and known economic conditions of the area are sufficient to request a full CBA, or something close to it.

29. The method adopted does not allow the Panel to understand the net economic benefit of the project, taking into consideration the displacement effects and local constraints.

30. I note that the Sunfield FTAA decision demonstrates that it is possible to ask questions about net benefit or disbenefits in the context of an EIA, without demanding a full CBA.[1]

Cost-benefit analysis

31. An appropriate economic tool for assessing the costs and benefits of a project is a CBA. The CBA framework is a systematic approach to identifying and valuing costs and benefits, and then calculating summary statistics to identify preferred options. It creates a clear, logical framework so that all the relevant issues have a place in the framework. That way, information and evidence have clear and logical places in the analysis. Any new pieces of information or concerns can also be incorporated into the framework without disrupting the rest of the economic analysis.

[1] Sunfield FTAA decision, at [501].

32. The steps in the NZIER CBA method are shown in Table 1. In developing the method, NZIER has taken into account advice from the New Zealand Treasury about the use of CBA (The Treasury 2021a, 2015).

Table 1 NZIER's CBA method

Ten steps in a CBA
1. Define the problem/opportunity
2. Decide whose benefits and costs count
3. Select options and specify the baseline (i.e. the 'without') scenario
4. Classify the kinds of benefits and costs and select the measurement indicators
5. Quantify the consequences (via the measurement indicators) over the life of the options
6. Value (attach dollar values to) the benefits and costs
7. Discount future benefits and costs to obtain present values
8. Calculate decision criteria
9. Analyse sensitivity of the results to assumptions
10. Make a recommendation and document the assessment

Source: NZIER

33. In my opinion, this framework provides a way to check whether the information in the BOGP application is sufficient for the panel to be fully informed about its costs and benefits.

34. As discussed below, the BOGP application is deficient primarily in four ways:

    a. For step 2 above, the question of whose costs and benefits to include and how to weight them has not been addressed. The net impact has not been assessed at both the regional and national levels. In addition, the true local effects have been muddied by treating Queenstown Lakes District and Central Otago District as equal and homogenous, rather than as two different places that will experience different impacts.

    b. For steps 4 and 5, the full range of benefits and costs has not been included and quantified, notably the environmental, amenity, social, and heritage impacts.

    c. For step 7, the economic impacts in the Benje Patterson report have not been discounted, and should be discounted at the Treasury rate of 8

percent. Furthermore, the environmental impacts (where quantifiable) should be discounted at the Treasury rate of 2 percent.

d. For step 9, the analysis has not tested the sensitivity of results to assumptions.

Total economic value

35. The CBA framework indicates how to assemble impacts and values into a coherent analysis. It does not indicate, however, what to include in the list of impacts. One tool for considering what to include is the total economic value (TEV) framework.

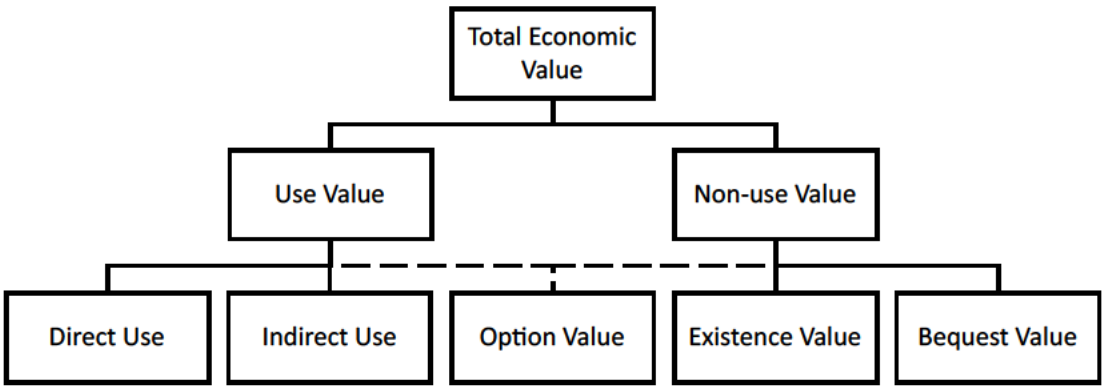
36. The TEV framework recognises that objects, goods and resources can provide people with benefits through several channels. In particular, it is useful for moving beyond the market economy to understand economic value more widely.

37. The market economy provides use value, especially direct use value. People buy things and use them, deriving a benefit. For example, they buy gold jewellery and wear it. Direct use value can also be derived from non-market goods or resources. For example, a cycle ride into the Dunstan Mountains may be free to the user at the time, but the person derives use value from the physical space.

38. Ecosystem services, too, can be a form of use value when they provide benefits to individuals. More broadly, individuals may be paying to maintain nature reserves that they have not yet visited but know they can use at some point in the future. They are maintaining an option value to use the reserves, and that option itself has a value.

39. Non-use values capture other types of value. For example, archaeological artefacts may have value to people who never see them; they derive satisfaction from knowing that they exist and are being protected. This benefit is considered an existence value.

Figure 1 Total economic value framework



Source: Grant et al. (2013), Ledoux and Turner (2002)

40. The economics report from Dr Richard Meade similarly suggests that a TEV approach to the economic impacts of BOGP would be appropriate.

41. There are other frameworks as well that provide a broader view of value than just the commodities bought and sold in the market economy. They include the ecosystem services framework (Grant et al. 2013; Braat and De Groot 2012), the Living Standards Framework (The Treasury 2021b) and the Better Life Initiative (Durand 2015). These options demonstrate that economists are well aware of the importance of non-market goods and services (Bateman et al. 2002). Social, cultural and environmental impacts may therefore be included in an economic assessment of a project.

Project economics

42. The economics of the BOGP are discussed across several documents that I have reviewed. While the numbers vary a bit, the general result is the same. Where there is discrepancy, I have relied on the Benje Patterson report for the most up-to-date figures. Key conclusions are noted below.

43. There is 1.25 million ounces of gold that can be extracted,[2] leading to undiscounted revenue of $6.75 billion.[3] The cost of extraction as the 'Total cost per ounce' is AU$1,950,[4] while the value of the gold is US$3,138 per ounce.[5] Thus, each ounce will return thousands of New Zealand dollars, and the million-plus ounces will return in the billions of dollars.

[2] Benje Patterson, October 2025, Table 1.
[3] Ibid, page 4.
[4] PFS, 1 July 2025, Table 3.
[5] Benje Patterson, October 2025, Table 1.

44. The economic value to the New Zealand national economy is reported as approximately $1.8 billion, which includes:

    a. Profits of the business will be taxed at the company rate of 28 percent, and there is, in addition, a 10 percent accounting profits royalty.[6] Thus, 38 percent of the billions in profit will go to the Crown.

    b. In addition, about 40 percent of the shareholding is based in New Zealand (the rest is overseas).[7]

45. Between the Crown payments and domestic shareholding, about 60 percent of profits (revenue less costs) will go to the New Zealand economy.[8] That figure is based on 38 percent of profits going to the Crown, and 40 percent of the remaining 62 percent of profits, being 24.8 percent of profits, going to New Zealand shareholders.

46. The BOGP will also involve costs that will contribute to the local and New Zealand economy. In that AU$1,950 per ounce of extraction costs are costs to build the facility, pay workers, pay contractors, maintain vehicles, and conduct other activities that have to happen on or near the site.

47. The Benje Patterson report says that there will be 351 direct jobs, 257 indirect jobs and 206 induced jobs.[9]

Assessment of the Benje Patterson report

48. The Benje Patterson report uses financial data from the company to calculate economic impacts based on multipliers from Infometrics. Its observations on mining productivity are correct.

49. However, its economic analysis has several weaknesses, as detailed below.

[6] Damian Spring, quoted in 'Tarras locals oppose major gold mining development in their backyard', NZ Herald, 8 March 2025, by Mike Thorpe.
[7] Ibid.
[8] Ibid.
[9] Benje Patterson, October 2025, Table 8 and Table 9.

Discounting

50. The economic impacts in the Benje Patterson report, e.g., Table 2, are presented as undiscounted values with 2025 pricing. This is not the standard approach for calculating the values of future economic activity. Discounted real values, which remove inflation and account for the time value of money, is preferred by Treasury and the basis for its advice on discount rates.[10]

51. Calculating discounted values of future monetary values recognises that a dollar today does not have the same value of a dollar received in the future, and a dollar in five years is different from one in 10 years. The standard approach is to calculate the present value of all monetary figures so that they represent the value as of today. Then, costs and benefits can be compared fairly, and future impacts can be summed up.

52. The impact can be substantial, especially with Treasury's recommended 8 percent discount rate. The discounted figures for BOGP are in the table below. Appropriate discounting reduces the $5.8 billion GDP impact to a $3.3 billion GDP impact.

Table 2 Impact of discounting GDP figures

Year	Patterson Total GDP ($)	Year index	Discount factor (8%)	Discounted Total GDP ($)
Year -2	15.4	0	1.00	15.4
Year -1	82.8	1	0.93	76.7
Year 1	289.1	2	0.86	247.9
Year 2	474	3	0.79	376.3
Year 3	495.7	4	0.74	364.4
Year 4	488.2	5	0.68	332.3
Year 5	534.7	6	0.63	337.0
Year 6	481.8	7	0.58	281.1
Year 7	486	8	0.54	262.6
Year 8	374.7	9	0.50	187.4
Year 9	466.3	10	0.46	216.0
Year 10	433.9	11	0.43	186.1
Year 11	356.5	12	0.40	141.6
Year 12	428.3	13	0.37	157.5

[10] The Treasury. 2015. Guide to Social Cost Benefit Analysis. Wellington. The Treasury. 2024. 'Discount Rates'. April 8. https://www.treasury.govt.nz/information-and-services/state-sector-leadership/guidance/financial-reporting-policies-and-guidance/discount-rates.

Year	Patterson Total GDP ($)	Year index	Discount factor (8%)	Discounted Total GDP ($)
Year 13	264.6	14	0.34	90.1
Year 14	82.4	15	0.32	26.0
Total	**5,754**			**3,298**

Information is not included[11]

53. The ratios and modelling are not provided, so they cannot be interrogated. There is no way to check the calculations because they are not provided, and the multipliers are not discussed in any detail. There is no way for a decision-maker or another economics expert to review the process and satisfy themselves that the calculations have been done correctly.

54. The Benje Patterson report states that it has used data from Santana Minerals' July PFS and that its assessment of economic impacts is based on that information.[12] I was unable to find the July PFS in the application documents, but was able to source it from the internet. Likewise, I have sourced what is referred to as the "August 2025" memo, which is an update for the June 2025 PFS prepared by Benje Patterson, from the internet.[13]

55. Similarly, the report says it has used data provided by Infometrics, but this data is not provided.[14]

56. I consider that that ratios and modelling that underpin the Benje Patterson report should form part of the application documents so parties and the Panel can properly test their calculations. For example, without that information I have been unable to properly assess:

    a. The expenses associated with BOGP that would contribute to the economic impact.
    b. The profit calculations, which affect the calculations of contributions to the government and GDP.

[11] I note that the graphic in Figure 6 of the Benjo Patterson report is almost surely wrong. It says that the average GDP per job for BOGP will be '$1.0 billion pa GDP per job (BOGP)'. Note that this is 'billion'. It was likely meant to be 'million'. 'Billion' would not tally with the rest of the analysis.
[12] Benje Patterson, October 2025, see "version history" section after the title page.
[13] Ibid.
[14] Ibid, footnote 3.

c. The assumptions regarding direct economic impact, in particular the local economic impact in comparison to national-level multipliers.
d. The assumptions regarding indirect and induced impacts, especially local multipliers compared to national ones.

Economic dislocations not fully assessed

57. The potential economic dislocations are not discussed in any detail. The opportunity cost of lost agricultural production is correctly included in the report.[15] However, the economy of the Central Otago district is tight and has little spare capacity – and has not for years.

58. The unemployment rate to March 2024, as reported by Infometrics, was 1.5 percent compared to a national average of 4.0 percent,[16] and the September 2025 unemployment rate for the whole Otago Region (Queenstown-Lakes, Central Otago, and Clutha Districts, plus Dunedin City and part of the Waitaki District) reported by MBIE was 2.8 percent compared to a national average of 5.2 percent.[17]

59. Even though the BOGP might represent just 0.7 percent of employment in Queenstown Lakes and Central Otago districts (referred to as 'Inland Otago' in the Benje Patterson report),[18] that figure is one-quarter to one-half of the unemployment rate.

60. The BOGP is likely to displace other economic activity. Although not directly stated in the Benje Patterson report, it appears that it is anticipated that all the direct jobs, 351 on average but potentially peaking to 504,[19] will be locally sourced from the Queenstown Lakes and Central Otago districts. For example, the report states that "sourcing hundreds of workers will be a complex recruited exercise, but the Inland Otago job market has previously demonstrated it can absorb such an employment lift".[20] It is not clear if the indirect or induced jobs (257 and 206 respectively[21]) are also proposed to be sourced locally.

[15] Benje Patterson, October 2025, page 8.
[16] https://regions.infometrics.co.nz/central-otago-district/employment/unemployment?compare=new-zealand
[17] https://webrear.mbie.govt.nz/summary/new-zealand.
[18] Benje Patterson, October 2025, page 15.
[19] Ibid, pages 11 and 20.
[20] Ibid, page 2.
[21] Ibid, Table 10.

61. Most of those workers will already be employed in existing businesses. The cost of this displaced activity has largely been ignored in the report. To demonstrate the net benefit of the project to decision-makers, the value of the displaced activity should be included.

62. Dr Richard Meade makes the same point in his economics report, that the analysis does not account for displacement effects.[22]

63. The draft decision of the Panel for the Trans-Tasman Resources Limited application found that there would be both new jobs and displacement of jobs.[23]

64. Further, the economic technique used is a poor choice for analysing the economic impacts of BOGP because it does not include displacement effects or competition for economic resources. It uses multiplier analysis, a technique that is appropriate for small changes in the economy or resources.

65. In addition, the Benje Patterson report says that the estimated economic impacts are upper limits on what can be expected, and that additional investment will be required to build the surrounding economy.[24] That is, the report explicitly indicates that the economic impacts are unlikely (they are upper limits), but does not indicate what the likely impacts are.

66. The project involves large growth in one sector, which will have offsetting impacts on other sectors. Those offsetting impacts are not captured in multiplier analysis. A better approach in this case is Computable General Equilibrium (CGE) modelling because of the impacts of resource scarcity in a region that is already at capacity.[25] This kind of modelling:

    a. Adjusts for limits in economic resources and includes competition for resources.
    b. Considers price changes in the economy and subsequent impacts on all industries.

[22] Richard Meade, March 2026, page 5.
[23] Taranaki VTM draft FTAA decision, at [367].
[24] Benje Patterson, October 2025, page 21.
[25] The same issue of multiplier analysis versus CGE modelling was discussed in the decision by the Fast-track panel for the Waihi North Project [FTAA-2504-1046] (18 December 2025). The decision was that the multiplier analysis in the application provided sufficient information despite the issues with the method raised by economic experts. In the case of the BOGP application, the lack of excess capacity in the local economy is crucial for understanding both the potential adverse impacts and the ability of the economy to deliver the claimed benefits.

c. Produces estimates of net economic impacts, accounting for adjustments in all industries.

67. If multiplier analysis is used, its weaknesses can be mitigated. The BOGP will involve economic resources – labour and capital – that could be used elsewhere in the economy. As discussed in the Benje Patterson report, mining jobs tends to produce more economic value than other jobs and receive higher wages.[26] By contrast, many service sector jobs, including some jobs in retail and hospitality, produce low value-added. To provide an analysis of the displaced economic activity, a CBA could estimate the opportunity cost of shifting resources out of the general economy into the BOGP. This would be accomplished by conducting another multiplier analysis, but this time considering the average productivity of the whole economy. That second analysis would estimate the economic cost involved in producing the economic benefit.

Indirect and induced impacts

68. Understanding the indirect effects of the BOGP is important for understanding how the benefits of the project flow through the economy. In the Benje Patterson report, there is little flow-on effect, and it is not clear whether it will be local (Central Otago), wider (Otago and Southland), or international. At this point, we can only make assumptions (or rely on promises). Induced impacts are often ignored for these purposes, not least because Treasury takes a dim view of claiming them.

Geographic designation obscures potential economic constraints

69. The geographic designation used in the Benje Patterson report could be obscuring some of the difficulties involved with sourcing the labour and supporting industries required for the mine as estimated by the report. The Queenstown Lakes District has a population of 53,800 (in 2025, according to MBIE), whereas the Central Otago District has a population of just 25,800 (in 2025, according to Infometrics[27]). Combining the two districts into a single 'Inland Otago' designation disguises the actual economic geography of the situation.

70. Many of the people in Queenstown Lakes are located far from the mine site. Queenstown to Tarras, for example, is a distance of 91 kilometres and would require over an hour to drive, particularly through the Kawarau Gorge that has

[26] Benje Patterson, October 2025, page 18.
[27] https://regions.infometrics.co.nz/central-otago-district.

speed advisory signs of 45 km, 55 km or 65 km in several places. Wānaka (Queenstown Lakes) is closer to the mine site but has a smaller population. Cromwell (Central Otago), the closest town, had a population of only 7,470 as of June 2025.[28]

71. The Benje Patterson report groups together two different areas, one more distant, and treats them as a single, homogenous location for the economic analysis. In fact, economic geography suggests that location and distance do matter. The fact that the bulk of the population and economic activity that underpin the report on economic impacts are actually quite distant is material for the analysis. The report inflates the size of the supposed economic base and downplays the potential economic disruption from the BOGP.

72. The Benje Patterson report indicates that Queenstown-Lakes and Central Otago Districts have grown and produced more jobs and houses.[29] The conclusion is that the area can grow more to support the mine. However, this conclusion ignores that the growth has put stress on the local economy and community. For example, local businesses find it difficult to hire because housing is in short supply.

73. The economic analysis should consider the impacts in a geographically informed way, taking into account the economic base of Central Otago District first, and then adding the wider geography. This approach would be similar to the economic analysis accepted in the Waihi North FTAA decision, which focused specifically on the impacts in the Hauraki District and accepted that impacts outside the district would likely be smaller than estimated.[30]

Overstated regional benefits

74. The dual nature of GDP leads the Benje Patterson report to overstate the benefits to the region. GDP is both a production measure and an income measure. It measures the value of what is produced, which generates incomes that ultimately accrue to people and households. The benefits to New Zealand – the income of its population and the funds available for public programmes – can be less than the GDP impacts. The mine might generate billions of dollars in local production, but it would not generate that same level of local income.

[28] https://tools.summaries.stats.govt.nz/places/SA3/cromwell.
[29] Benje Patterson, October 2025, pages 5, 16 and 20.
[30] Waihi North FTAA decision, at [815].

75. I note that the economic review by Sense Partners for Otago Regional Council also raises this issue.[31] I agree with that review that GDP and Gross National Income (GNI) diverge, which can be especially important for this type of overseas-owner project. The Richard Meade report raises the same issue when discussing the lack of allowance for overseas ownership.[32] Profit that accrues to overseas ownership is included in GDP but not in GNI.

76. The royalties and taxes (undiscounted $1.8 billion[33]) go to the central government. The net profits (undiscounted $3.2 billion[34]) mostly flow out of the district, because 60 percent of the shareholding is outside New Zealand and some portion of the remaining 40 percent is outside Central Otago and the Otago Region. The net wages (take-home pay, undiscounted $570 million[35]) are the portion of GDP that creates income for the district or region. One way to assess the mine's net regional benefit is to compare its adverse impacts (or disbenefits) against just the undiscounted $570 million. There could be indirect economic effects from sourcing of materials and services locally, but the Benje Patterson report and the information from the applicant do not have a quantified commitment to local sourcing, and there is no assessment of displacement effects.

No sensitivity analysis

77. The analysis in the Benje Patterson report does not account for risks. The economic analysis assumes that everything goes as planned. There is no risk assessment that quantifies the impacts on the economics if costs, production, or markets shift. For example, the report shows that the assumptions in the application figures lead to better results than OceanaGold's existing operation: 'BOGP will offer higher productivity than the Macraes mine'.[36] The difference should lead to some caution about accepting the application's figures. If nothing else, economics would suggest that better locations would be mined first, so that later mines are less productive.

78. Conversely, the analysis in the Benje Patterson report and the figures in Table 2 do not account for a better-than-expected result or upside risk. For example, the

[31] Peer Review: Matakanui Gold FTAA: Report for Otago Regional Council, by Sense Partners, November 2025.
[32] Richard Meade, March 2026, page 27.
[33] Benje Patterson, October 2025, page 9.
[34] Ibid.
[35] Benje Patterson, October 2025, page 9 ($569.6 million after tax contribution of labour to GDP).
[36] Ibid, page 18.

gold price in Table 2 is low compared to the current price of about NZ$8,000 per ounce (14 January 2026).

79. Santana Mineral's sensitivity analysis,[37] drawn from its company's financial reporting, and the table below demonstrate the impact of 25 percent declines in the assumptions used to assess the BOGP. This decline is within the accuracy range reported.[38] Profits could fall from $2.8 billion to $0.5 billion. The application should include such scenarios in a sensitivity analysis, especially because it believed the information was relevant for financial markets.

Table 3 Alternative profitability figures

Projection	Price per oz	Yield	Revenue	Cost per oz	Total cost	Profit
Santana Minerals Limited (2024)	$3,900	1.12 m oz	$4.4 billion	$1,392	$1.6 billion	**$2.8 billion**
w/ 25% change	$2,925	0.84 m oz	$2.5 billion	--	$1.9 billion	**$0.5 billion**

N.B: Figures in the table have been rounded. Values presented in New Zealand dollars.
Source: NZIER, Santana Minerals Limited

80. For comparison, the Waihi North FTAA decision accepted a gold price of US$2,000 per ounce.

81. The FTAA Panel for the Trans-Tasman Resources Limited (TTRL) application similarly requested a sensitivity analysis from the economist for the applicant.[39] The sensitivity analysis presented considered inputs one by one. The Panel requested an analysis that considered all inputs together: best- and worst-case scenarios.[40] This sets a precedent for Panels considering multiple variables at once in sensitivity analysis.

[37] Santana Minerals Limited, 2024, Scoping Study 2024: Rise & Shine Initial 10 Years, page 20.
[38] Santana Minerals Limited, 2024, 'Outstanding Economics - Scoping Study First 10 Years, from RAS Only', ASX Release, April 17.
[39] For transparency, I report the following: (a) NZIER was the economic expert for TTRL for the FTAA application; I have not interacted with that team on that project; and (2) I was an economics expert for TTRL over 10 years ago, and have not had commercial dealings with them since 2014.
[40] Taranaki VTM draft FTAA decision, at [401].

82. The NZ Fish & Game Council in its report on BOGP also argues that there is insufficient consideration of risks in the application, and insufficient information in the application to understand the risks that have been assessed. From an economic perspective, this equates to a lack of sensitivity analysis of the risks involved with BOGP.[41]

Mine life

83. The Benje Patterson report says the life of the BOGP is 13.8 years, with two years of pre-production and operational mining spanning 14 years.[42] It is unclear how this mine life factors in the CIT and SRE mine pits. From the report (which relies on the July PFS), it appears that the 14 years only relates to the RAS open pit, RAS underground, and SRX deposits.

84. However, the AEE states:

    a. "The BOGP will produce 1.25 million ounces of gold over a mine life of approximately 14 years."[43]

    b. "Open pit mining will occur at the RAS, CIT, SRX and SRE gold depositions. The open pit lifespan for the BOGP is expected to be approximately 14 years."[44] The footnote to this statement states that these figures are in accordance with the July PFS.[45]

a. The "Indicative Project Timeline" section of the AEE includes Figure 3-38[46] which refers only to the RAS open pit, the RAS underground and the SRX open pit. The AEE says that it shows the total material to be processed from these locations across the project timeline is 14 years.

85. Figure 3-38 appears to be a direct copy of Figure 1 from the July PFS (page 3). The PFS says that Figure 1 shows the "projected ore feed at 1.2Mtpa from the RAS open pit, RAS underground, and SRX deposits over the life of the mine." As noted above, the PFS does not appear to refer to the CIT and SRE mine pits.

[41] FTAA-2507-1089 Bendigo-Ophir Gold Project, Draft comments by New Zealand Fish & Game Council, (undated) at [111].
[42] Benje Patterson, October 2025, page 4.
[43] AEE, page 393.
[44] AEE, page 138.
[45] Santana Minerals Limited, 2024, 'Outstanding Economics - Scoping Study First 10 Years, from RAS Only', ASX Release, April 17.
[46] AEE, Project Description: page 221.

86. Further clarification is needed to understand how, or if, the CIT and SRE mine pits are factored into the life of the mine, and therefore, the economic calculations included in the Benje Patterson report.

87. Further, the Benje Patterson report considers 16 years of economic impacts (years -2 to 14).[47] Remediation activities would occur much further into the future. The AEE variously states:

    a. "The BOGP is expected to be an approximately 25-year project including pre-development, construction, operation and active closure activities."[48]

    b. "The proposal will include start-up, mining activity, and closure phases which will occur over a 30-year period."[49]

    c. The "Ardgour Restoration Area Management Plan has been prepared to guide these works (provided in Part G of this application) which sets out 35-year restoration outcomes to be achieved in the area."[50]

88. Putting aside the apparent discrepancies in how long the entire project life is (not just the 14-year operational period), the Benje Patterson report does not cost any of the post-operational phases. There is little to no assessment of wind-down and remediation costs, and no discussion of the mechanism for keeping the site environmentally contained. The total cost of the project might therefore be significantly underestimated.

89. Employment, costs and profits will vary over the entire project life, thus it is important to be clear about its length and activities throughout.

Double-counting

90. The government contribution section of the Benje Patterson report[51] presents numbers in a way that could produce double-counting. Specifically:

    a. The ACC contribution is simply payment for the service of rehabilitation of injured workers. It is incorrect to include the payment without also including the liability. Given that the aim of ACC is to pay for rehabilitation

[47] Benje Patterson, October 2025, Table 2.
[48] AEE, page 221.
[49] AEE, page 331.
[50] AEE, page 219.
[51] Benje Patterson, October 2025, section 4.2 and Table 3.

(not make a profit), the first-guess approximation is that the ACC payment exactly offsets damages or liabilities caused by the project, producing no benefit. Furthermore, the Government has been adamant in recent years that ACC is a corporation – albeit State-owned – and it has to manage its affairs without help from general tax revenues. It has built up its own reserves to fund its own liabilities. Economically, the ACC payments are just making people whole after injuries. Politically, ACC is not public money.

b. The report mentions the salaries (average of $140,000) and the PAYE. The salary includes the PAYE, so presenting both could lead to double-counting the benefit. The salary is the remuneration paid to employees before taxes are subtracted from their paychecks. It is not the take-home pay of the employees. The take-home pay is the salary less the PAYE. When assessing the benefit of BOGP, each metric of the benefit – salary, PAYE, GDP, employment – should be examined in isolation and the amounts should not be added to each other.

91. The total pay to workers is $785.7 million, including PAYE and ACC.[52] ACC payments would be 1.67 per $100 earnings for the employees' contribution[53] and 0.87 per $100 earnings for the company contribution.[54] The dollar amounts are $12.8 million and $6.7 million, respectively, for a total of $19.4 million. This represents about a 1 percent overstatement of the total contribution to the government. While this is a small amount relative to the project, it is important to establish which impacts are truly economic benefits and which ones are transfers or costs.

Summary

92. The Benje Patterson report is insufficient to establish either the gross economic benefit or the net economic benefit of BOGP, and does not demonstrate either the regional or national benefit of the application.

    a. First, the headline impact should be reduced by a total of 43 percent to account for proper discounting at 8 percent annually as required by Treasury.

[52] Benje Patterson, October 2025, page 9.
[53] https://www.ird.govt.nz/income-tax/income-tax-for-individuals/acc-clients-and-carers/acc-earners-levy-rates.
[54] https://www.acc.co.nz/assets/corporate-documents/Levy-con-results/2022-25-work-account-levy-rates-for-businesses.pdf.

b. Second, the impact of dislocation needs to be considered, especially given the lack of excess capacity in Central Otago.

c. Third, regional benefit should consider the impacts that can reasonably be expected to accrue to Central Otago District, which will bear most of the costs and receive a fraction of the benefit.

d. Fourth, the national level impacts should also consider which impacts to include, and inform the Panel about impacts that stay in New Zealand versus impacts that go offshore.

e. Finally, the report should include a sensitivity analysis to demonstrate the net economic impact under different assumptions; it appears that a reasonable set of assumptions could lead to negative returns.

93. In addition, the report needs to provide a better evidence base. It uses figures from the applicant but does not provide them. The data are especially important because the application is unclear about which locations are being assessed, which production is included, and which time period is considered. Providing the underlying data would add clarity.

Environmental impacts

94. The Benje Patterson report does not assess the economics of non-market matters such as amenity values, loss of biodiversity, intrinsic values or impacts on ecosystem services. Economic analysis, especially CBA, may or may not include valuation of environmental impacts. Below are some relevant considerations. I include example calculations of environmental, amenity, and social impacts in Appendix A of this statement.

Scope of the environmental impacts

95. The AEE provides relevant data for an economic assessment of the environmental effects of the application. In this section, I provide some dollar-value calculations to inform a CBA. Providing dollar values is important. In a New Zealand study, researchers showed that decision-makers are more likely to take environmental impacts into account if those impacts are expressed in dollar values (Eppink et al. 2016).

96. If a cost-benefit analysis is the frame of reference, then assigning economic values to non-negligible environmental impacts puts them on an even footing with commercial benefits. Expressing environmental values using money helps decision-makers decide about allocating resources to competing uses (De Groot et al. 2012).

97. I have read the Waihi North fast-track decision where the Panel dismissed the need to monetise adverse impacts. It cited the Supreme Court decision in *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board*, saying*: "*It was argued that the reference to "economic benefit" required a cost benefit analysis which ascribed monetary values to environmental, social and cultural costs. This argument was rejected by the Supreme Court"*.* While I acknowledge this is at least partly a legal issue (and was in the context of statutory references to "economic benefit" as opposed to the undefined use of "benefit" under the FTAA), I offer two counter-arguments.

98. First, as noted, research on decision-making has shown the importance of monetising impacts (Eppink et al. 2016). Second, the experience of preparing this evidence bears out the importance of using a common scale to measure impacts, i.e. commensurability. At the beginning of my analysis, it seemed 'obvious' that extracting over a million ounces of gold would have economic benefit that would outweigh environmental, social and cultural costs. It was only in examining the research on non-market values and making the calculations described in this evidence, including monetising impacts, that the magnitude of potential losses relative to economic benefits became clear.

99. One way to understand the economic value of the environment is with a holistic framework, for example, the ecosystem services framework (Hassan et al. 2005). This framework categorises the services that humans receive from the natural environment into provisioning, regulating, cultural and supporting (Dymond 2013). Those functions, or changes to those functions, can then be assigned economic value. A good example is the work of Dominati (2014), which investigated the value of soil in New Zealand dairy farming using the ecosystem services framework.

100. This approach is useful for economists because it connects to domestic and international research on the value of ecosystems. A seminal article on ecosystem valuation was Costanza et al. (1997), which has been cited thousands of times. Further work has produced additional estimates (De Groot et al. 2012; Hassan et

al. 2005), including for New Zealand (Cole et al. 2014; Patterson et al. 2018; Sandhu et al. 2015, 2008).

101. The application has used a different approach. It includes a list of species and expected impacts in Table 1-1 of the application.[55] Because this is the environmental information provided, the approach to economic valuation would need to be species-by-species and impact-by-impact. There is some environmental literature on which to base a valuation. However, it is unlikely that the very species and exact impacts mentioned in the application have been measured in economic studies, so a valuation would need to rely on a technique called 'benefit transfer' (Bateman et al. 2002). That approach uses values estimated in one context to estimate economic values for a different context.

102. Environmental impacts also extend beyond impacts on individual species; for example, landscape amenity values can be included in this category. The application describes many impacts that fall within the environmental category for the sake of a CBA. A list summarising those impacts is provided in the table below.

[55] AEE, pages 315–325.

Table 4 Environmental impacts noted in the application

From Section 6, Assessment of Environmental Effects

Type of impact	Impact per application	Direction	Comment
Air Quality – dust	With mitigation, less than minor	Negative	
Air Quality – gases	With mitigation, negligible	Negative	
Contaminated Land	Mitigations proposed; net impact unclear	Negative	
Biodiversity programme & funding	Landscape-scale restoration and protection measures, and proposed funding	Positive	Gains are in the future; discounting applies
Terrestrial habitat loss & re-establishment	Direct loss with large-scale re-establishment of native vegetation	Mixed	Gains are in the future; discounting applies
Wetland loss & creation	Net gain for swamp/marsh wetlands; net loss for seepage & gully fens	Mixed	Table 1-1 (pp. 315–325) could be used to assess values; 7.5 ha of constructed wetlands (gain) and 3.1 ha of natural wetlands loss (p. 282)
Hydrology & aquatic habitat	Altered and complex	Mixed	
ELFs, erosion & water-quality risk management	Effects are less than minor	Mixed	Long-term management is required; risks should be evaluated
Biodiversity outcomes for vegetation and habitats	Mixed effects -- gains and losses; very high, high, moderate, etc.	Mixed	Table 1-1 (pp. 315-325) could be used to assess values

Type of impact	Impact per application	Direction	Comment
Biodiversity outcomes – fauna (birds, lizards, invertebrates)	Species-specific residual effects. Ecological improvements proposed (p. 281)	Mixed	P. 313: 'The unavoidable loss of irreplaceable and vulnerable species or communities will be permanent, and either cannot be replaced or balanced by the suite of beneficial actions.'
Geotechnical stability & seismic risk	With recommendations followed, no impact	Neutral	Long-term stability is achievable with monitoring and adherence to NZDSG
Governance & long-term closure planning	Multi-agency governance framework is required, with closure plans updated every three years and refined across the 30-year life of the project	Unknown	Uncosted
Hazardous Substances	Includes multiple hazardous substances. A Hazardous Substances Environmental Management Plan has been prepared	Unknown	Should be neutral
Landscape	Negative, with mixed size. In summary, moderate adverse effects on ONL	Negative	Rehabilitation proposed. Timeframe is 30 years
Lighting	Meets mandatory requirements, and accepted mitigations would "limit ecological impacts of exterior lighting" (p. 342)	Negative	
Noise/Vibration	Minimal in rural residential noise environment	Negative	
Visual/Landscape Amenity	Negative, up to moderate-high. Includes amenity impacts from State Highways 8, 8a, and 6	Negative	

Source: NZIER, Matakanui Gold Limited (2025)

103. A review of the table above produces the following observations:

a. The BOGP will produce some negative environmental impacts that are neither mitigated nor remediated. This is the conclusion of some of the reports cited in the application, for example, the report on impacts on wetlands.[56]

b. For some categories, both positive and negative impacts are described (and are indicated as Mixed in Table 3). For a CBA, the quantum, value and timing of those impacts are important.

c. Negative impacts tend to apply in the short term (for example, during construction), and remediations are proposed for the future (after mining has ended). The timing difference is important for CBA. It is standard practice in CBA to apply discount rates to impacts in the future (The Treasury 2015, 2024), and the default discount rate in New Zealand for a commercial project is 8 percent (The Treasury 2024). As a result, impacts lose about one-half of their value when they are 10 years in the future; they have only one-tenth their value when they are 30 years in the future. In simple terms, the nominal value of proposed remediation needs to be 10 times the damage to compensate for the near-term negative impacts.[57]

d. The proposed mining activities are planned, organised, specific and funded. The proposed offsets have less of that specificity and institutional presence. As a result, the proposed benefits are more uncertain than the expected costs. In an expected value framework used to value uncertainty in economics, a typical approach is to apply an adjustment factor to account for the lack of certainty. An impact that will definitely happen tomorrow could be assigned a probability of 1. A proposal for remediation without a plan, funding, or an independent organisation to guarantee it should be assigned a lower probability. The present value of that benefit would thereby be reduced.

[56] Part A – Bendigo-Ophir Gold Project – Substantive Application, page 310: 'After measures to avoid or minimise adverse effects, the BOGP is expected to result in the direct loss and associated effects on 607 ha of terrestrial habitat'.

[57] This statement is based on the following. Assume a negative impact of $100 per year for 30 years. The present value at an 8 percent discount rate is $1,126. By comparison, a positive impact of $100 per year that occurs in year 31 and lasts forever has the following value: (100/0.08)/(1.08^31)=115. The ratio $1,126:$115 has a value of 9.8.

e. There are uncosted aspects to the application. In particular, the imposition on the district and regional councils in terms of time and expenses has not been costed. The project is expected to generate revenue for the central government, while local and regional governments will bear the costs of governance and long-term planning. Whether rates revenue and council charges would be sufficient to offset these costs has not been explored in the Benje Patterson report.

104. One challenge with quantifying economic benefit and then comparing it qualitatively with environmental harm is that it can be difficult to account for long time periods and discounting intuitively. Assume the mine produces $400m of GDP benefit every year for 20 years. The total value is $4,241m, at an 8 percent discount rate. The environmental harm is different in two ways: it goes on a long time, and The Treasury says we should use a 2 percent discount rate. Assume the annual harm is one-quarter of the benefit, or $100m. The total value over 100 years is $4,396m, which outstrips GDP benefit.

Impact	Annual impact	Discount rate	Over 100 years
Mine	400	8%	4,241
Environment	-100	2%	-4,396

Social impacts

105. My main observations about social impacts are:

a. The Benje Patterson report is heavily economic rather than social.

b. The social data is from outside what the report calls the 'Area of Influence – Cromwell focus', i.e., the Cromwell basin.

106. Social licence to operate is an established concept with Australian mining. 'Social licence' is the idea that companies will seek to do more than the legal minimum, but instead "avoid activities that societies (or influential elements within them) deem unacceptable" (Gunningham et al. 2004). "Literature on natural resources has argued that to proceed with the development of a mine, mining companies need a "licence to operate" – the approval of a legal authority, embodied in a regulatory licence; the approval of the affected community and broader society, a social licence; and the approval of investors, lenders, or purchasers, an economic licence" (Mills et al. 2025).

107. One description of the different ways that consultation with the community can happen is Arnstein's ladder of participation (Cornwall 2008). It provides a continuum from non-participation and manipulation to partnership and citizen power. Alternative, Pretty's typology of participation runs from manipulative participation, in which representation is a pretence, to functional participation and finally self-mobilisation (Cornwall 2008).

108. The BOGP Socio-Economic Baseline Assessment[58] shows little evidence that the applicant has engaged with the local community in ways that are higher on the ladder of participation or reflect functional participation. Information events are one-way affairs: they dispense information, but do not provide a mechanism for community input to change the pre-determined course of a project.

109. The social data provided is not even about the local community. The community section of the Socio-Economic Baseline Assessment starts with data from Queenstown Lakes District Council, and later says that "environmental values extend beyond district borders".[59] In the 'Community sentiment' section, the report notes, "No specific data (such as surveys) on community sentiment towards mining could be sourced."[60]

110. The applicant has not done the work to understand the impact of the project on the community or to obtain social licence from the community.

Impact on housing

111. The main social impact considered in the Benje Patterson report is the effect on housing. The report presents the employment impacts of the BOGP and expresses them as percentages of jobs in Inland Otago and Otago. Because the report uses larger geographic areas than just the Central Otago District, it presents the employment impacts as small relative to the economy. The report then calculates that only 218 homes would be needed for the average annual workforce of the mine.[61] This presentation has the potential to downplay the possible housing impacts.

[58] Bendigo-Ophir Gold Project Socio-Economic Baseline Assessment, Rationale, 3 May 2024.
[59] Ibid, section 4.9, page 25.
[60] Ibid, page 26.
[61] Benje Patterson report, page 20.

112. According to the Benje Patterson report, the full economic benefits of the BOGP can be achieved only with sufficient investment in supporting industries.[62] For those industries to expand to the extent necessary, they also need employees. Thus, housing is needed not just for the 351 mine workers, but for the 814 workers needed for the direct, indirect and induced impacts. That takes the required houses from 218 to 509, which is not included in the Benje Patterson report.

113. Economic geography suggests that more of the new growth will need to happen close to the mine site (not in Queenstown), which will put pressure on Cromwell, Tarras and Luggate. Infometrics reported that the Cromwell Basin contained 4,872 dwellings in 2023,[63] so 509 new houses are equivalent to about 10 percent of the existing supply.

Flow-on impacts on public goods and services

114. This calculation raises questions about the demand for public goods and services from the BOGP. Some of the services or infrastructure affected will include:

a. Roads, adding to vehicle transit time in the area.
b. Schools, requiring capital and operational expenditure.
c. Recreation.
d. Emergency services, including volunteer rural firefighters and emergency medical staff.
e. Medical services, both general care and acute care.
f. Demand for freshwater, sewage services and stormwater drainage.
g. Waste, including household waste.

115. The application provides information that could be used to develop a more complete economic report. The material provided in Section 6 of the AEE is summarised in Table 4 of the application which I have replicated below. The application describes negative impacts related to heritage, archaeology, recreation, access, and traffic. It also describes positive impacts related to financial support in the community, infrastructure and traffic. These impacts have not been assigned dollar values. For the most part, they are ignored. They should at least be mentioned in an economic CBA, even if they are not quantified or assigned dollar values, because they are part of the consideration of the application's net impact.

[62] Benje Patterson report, page 17.
[63] https://regions.infometrics.co.nz/cromwell-basin/census/total-counts/dwellings.

116. A social impact assessment could go further to investigate residents' identity and sense of place. It could then determine how the project could affect that. A social impact assessment, however, is not expected from a CBA. A CBA would apply economic values to the impacts described in a social impact assessment. I note that a social impact assessment appears missing from the application.

Table 5 Social impacts noted in the application

From Section 6, Assessment of Environmental Effects

Type of impact	Impact per application	Direction	Comment
Heritage & archaeology	List in Table 6-1 Disturbance, partial removal, or full removal of archaeological features Mixed heritage value and mixed levels of negative impacts	Negative	Includes major impacts Mitigated through documentation, monitoring, and controlled works P. 352: 'The recommended mitigation ... would go some way to mitigate and offset the adverse effects'
Archaeology (water races)	Damage to or loss of segments of water races	Negative	Localised permanent loss
Archaeology (unexpected finds)	Risk of encountering unrecorded mining, pastoral, transport or Māori archaeological material during earthworks	Negative	Effects reduced if protocols followed
Recreation/Access	Access across the Dunstan Mountains is meant to be maintained Temporary loss of public access to Thomson Gorge Road and Come-in-Time Battery during mining/blasting, with long-term changes to recreation routes P. 359: 'Noise, light and landscape effects are otherwise considered minor for all public conservation and recreation areas'	Negative	Report notes that a legal mechanism is required to achieve mitigations The News reported on 9 October that access on the 'historic and public Shepherds Creek road' was blocked 'by a locked gate, with a Santana-branded sign'
Social/Community	P. 280: 'MGL is committed to investing within the local community through partnerships, sponsorships and supporting students with scholarships and learning	Positive	The contribution to the community does not appear to be in the form of a permanent mechanism, such as an

Type of impact	Impact per application	Direction	Comment
	opportunities. This currently includes sponsoring the Central Otago Football League, the Light Up Cromwell community event and providing two local scholarships for 2025 study, one for tertiary study and one trade scholarship.'		endowment or a contribution to an existing community trust
Infrastructure	P. 280: 'high voltage power will be brought to the Project Site by Aurora Energy.'	Positive	
Traffic	Increased traffic volumes during construction (≈400 vpd) and operations (≈250 vpd), requiring safety upgrades at SH8/Ardgour Rd, widening/sealing of Thomson Gorge Road, and replacement of Thomson Gorge Road access via Ardgour Rise	Positive and negative	Mitigations would produce 'an acceptable outcome' No mention of the one-lane Lindis River bridge on SH 8 at Ardgour Road

Source: NZIER, Matakanui Gold Limited (2025)

Heritage impacts vs social impacts on residents

117. For the CBA, the social impacts could be divided into two types. One type is a loss of value from the destruction of historical features and the loss of access to recreational areas. There is research on the value of heritage and cultural sites (Nijkamp 2012), including the value of marginal changes in the use of heritage sites (Choi et al. 2010). At least one meta-analysis has attempted to assign values to aspects of heritage sites (Wright and Eppink 2016), which would facilitate benefit transfer calculations (Bateman et al. 2002). I have not attempted to value the heritage impacts of the application, but note that such a desktop exercise could be undertaken.

118. The other type of social impact is the loss to residents due to increased demand on public resources and facilities. As noted above, the size of the economic growth necessary to support the BOGP is equivalent to about 10 percent of existing local households. To maintain public services at the level currently experienced by the local population, there must be investment in local roads, schools, health facilities, parks, etc. There is no provision for such investment in the application, nor is there any calculation of the social costs. Those are costs that need to be borne by someone to support the application. In the context of the CBA provided, they are costs that will either fall on the government (at various levels) as additional costs, or fall on the local population as degradation in existing services.

Bond

119. The NZ Fish & Game Council discusses the bond that should be required of the applicant. Its discussion of bond, insurance or other financial security conditions is a good consideration of the issues and well supported by economic risk considerations. First, there is inadequate information in the application. Second, the risks associated with closure are inadequately considered from a risk perspective. Third, perpetual costs need to be matched by perpetual resources.

120. The economic view is focused on 'expected value': what is the expected value of impacts and therefore what should be paid to off-set them? Expected value has two parts, multiplied together:

    a. Probability – what is the probability of something occurring? The Damwatch document[64] focuses on the P50, which I assume is 50 percent

[64] Bendigo-Ophir Project: Review of Bond Introduction for 2025-2026, Damwatch, 5 December 2025.

probability. In fact, we want to know the full range of things that might occur at all probabilities: 20 percent, 50 percent, 99 percent, etc.

b. Impact – what is the size of the consequences, should that something occur? This removes probability for the moment and focuses on impacts and consequences.

Multiplying the two together produces the expected value for each possible consequence or action.

121. The economic argument is this: if the project has little risk, and if all the risks will be well managed by the applicant, then insurance against the (small and unlikely) consequences should be inexpensive to procure, especially in light of the high and growing price for the gold the mine will produce.

122. The Mine Closure Plan has 22 closure risks, according to Damwatch. What impacts or consequences would each risk produce, and what are the probabilities of them occurring? This information is not provided.

123. Further, little information appears to be available for quantifying the expected values of the risks. The report notes, '*Currently the risks within the register are not allocated to risk owners and the effectiveness of mitigation controls are not identified.*'[65] Without the effectiveness of mitigation controls, it is difficult to understand possible impacts.

124. The Richard Meade report also notes the potential issues with risks, issues with the rehabilitation bond, and the protection afforded by the limited liability corporate structure.[66]

125. Finally, the bond is focused on the activities surrounding mine closure and rehabilitation. It is not focused on potential environmental impacts of the project. Here, we can turn to the law and regulations around the Exclusive Economic Zone and oil for a useful comparator. Under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012, bonds are explicitly treated in the legislation, e.g., section 65. It considers parent companies, guarantors, survival of the guarantee, etc., which are all considerations for creating a pool of resources that will last for a long time to deal with long-term environmental impacts. As NZ Fish & Game Council recognise, perpetual costs should be matched with perpetual resources to deal with them.

[65] Damwatch, page 7.
[66] Richard Meade report, page 68.

126. Further guidance in New Zealand on end-of-life risk is with NZ Petroleum & Mineral projects (administered by MBIE); EPA has a consenting role here.[67] This material demonstrates that it is possible to require bonds with appropriate guarantor for adverse environmental impacts far into the future. For example:

> *S65(2) A condition of a consent that describes the terms of the bond may—*
> *(c) require the bond to be given to secure performance of conditions of the consent, including conditions relating to any adverse effects on the environment or existing interests that become apparent during or after the expiry of the consent:*
> *(e) require the holder of the consent to provide a guarantor (acceptable to the marine consent authority) to bind itself to pay for the carrying out of a condition in the event of a default by the holder or the occurrence of an adverse environmental effect requiring remedy:*

127. The bond described in the Damwatch document is likely to be insufficient, because:

    a. It focuses on middle-probability risks, not less common ones; and

    b. It focuses on rehabilitation, not long-term environmental impacts.

128. From an economic perspective, the risks have been inadequately characterised, so that their expected value cannot be assessed. As a result, the monetary value of those risks – which would be offset by an appropriate bond – cannot be determined.

Outstanding questions

129. As a result of my review of the application documents, I have outstanding questions. I have reviewed the list of questions contained in the Panel's 1 April 2026 RFI and believe they should be answered to provide a more complete picture of gross and net economic impacts. In my opinion, the following further issues remain outstanding regarding the economics:

    a. Economic impacts on Central Otago District, rather than Inland Otago, should be specified for all impacts.

[67] https://www.nzpam.govt.nz/permits/petroleum/compliance-reporting/decommissioning-of-petroleum-infrastructure-and-wells/financial-capability-and-financial-securities-guidelines.

b. Sensitivity analysis should include assessment of impact when multiple inputs are changed, not just one-by-one changes to inputs.

c. Impacts on housing should be investigated, including the total number of units required, likely locations, impacts on housing demand, consequent impacts on price and availability, and potential supply responses.

d. Potential displacement impacts on existing economic activity in the Cromwell basin and Central Otago District should be detailed and the economic value estimated.

e. Impacts on public services should be detailed and the economic value estimated. They include increased demand on existing schools, roads, health facilities, and other public services.

130. I consider these matters to be of critical importance to understanding the BOGP's material adverse impacts on economics. Without full clarity on the matters addressed in the questions, I do not consider that the project's impacts can be fully assessed and understood.

Other FTAA decisions

131. I have reviewed the Waihi North FTAA Panel decision and the Taranaki VTM FTAA draft decision. Some comments about those decisions and their relevance for the BOGP application are provided below.

132. The Waihi North economic analysis assumed no net loss of biodiversity or ecosystem services, so offered no economic valuation of those impacts. The situation with BOGP is different, because net losses are expected.

133. For Waihi North, the application would extend existing economic activity. There are potential employees, contractors, and suppliers in the district who already work with the existing mine. BOGP would involve creating that activity and those relationships, rather than extending them.

134. The Waihi North decision considered taxes and profits. In the discussion, it noted that the new project would have high profits compared to existing operations. From an economic perspective, it is curious that both Waihi North and BOGP are claiming to be more profitable than existing operations. The natural question is to identify the drivers of the improvements. Technology could be driving improvements, and those improvements could be described by the applicants. If

the driver is the location and its mineral resources, the immediate economic question is why the site has not already been mined.

135. For Taranaki VTM, the viability of the operation was ruled out as an issue. The Panel noted that if the operation was not viable and produced no economic benefit, it would also not produce adverse impacts. For BOGP, the same may not be true. It may be possible to create adverse impacts that continue even if the operation is no longer economically viable. Thus, viability of the operation should remain an issue for BOGP.

136. For Taranaki VTM, the Panel noted that alignment with government objectives was not a sufficient benefit in itself.

137. For Taranaki VTM, the Panel discussed a charitable trust fund, and listed a fund of $50,000 per year as one of the benefits of the project.[68] BOGP has not included a similar fund for the local community.

138. For Taranaki VTM, the Panel found that annual royalties for the government and tax contributions are likely to be highly variable.

Conclusion

139. I have reviewed the Benje Patterson report and descriptions of the economic, environmental and social impacts of the BOGP.

140. I found the following:

a. The report is not a cost-benefit analysis. The framing of the FTAA suggests that a CBA should include both costs and benefits, and should consider economic, social, environmental and heritage impacts. The Patterson report does not.

b. The calculation of gross economic impacts appears to have been conducted according to standard practice, using multiplier analysis. However, the report is missing details on the assumptions and calculations that would enable a full peer review to verify its accuracy.

[68] Taranaki VTM FTAA decision at [451] and [453].

c. The report does not include discounting of economic impacts, which would reduce the calculated value of the project by over 40 percent.

d. A key question with an economic analysis is who bears the costs and who receives the benefits. The report does not fully explain where costs and benefits fall. It does not provide a dollar-value estimate of the benefit to Central Otago District, Queenstown-Lakes District, or Otago Region. It does not provide a dollar-value estimate of the costs.

e. The multiplier analysis used in the report is not the best tool for understanding economic displacement in an economy without spare productive capacity. Central Otago has low employment and a tight housing market. BOGP will produce additional labour needs, both directly for the mine and indirectly for the support industries. The economic benefit calculations assume that those resources are available, but that is a questionable assumption in this context. Other tools, such as CGE modelling, are better suited for economic analysis in this context. Alternatively, multiplier analysis could also be used to calculate the project's opportunity cost, which can be compared with the benefit in the usual CBA process.

f. At first glance, the proposal to extract over a million ounces of gold and sell it for thousands of dollars an ounce seems overwhelmingly positive. However, a more thorough analysis reveals problems with that assessment. The negative environmental and social impacts noted in this evidence – some of which continue for decades – can be assigned economic values. An assessment of the possible local economic benefits suggests they are less than $570 million in total (undiscounted), and risk analysis using the applicant's own data suggests that the profit from the BOGP could amount to just $500 million in total (undiscounted) over the project.[69] These figures raise questions about the net benefit of the project for the local community and for national-level impacts.

g. The material provided does not provide enough information about both likely and unlikely outcomes. This lack of information is relevant for a sensitivity analysis, which should be conducted to understand the range of potential economic impacts. It is also relevant for developing an

[69] See Table 3 in paragraph 79.

appropriate bond or other mechanism, which should have sufficient value and permanence to deal with a range of potential adverse impacts.

h. There has been no attempt at assigning economic values to the many environmental, amenity, social, and heritage impacts. There are methods for making such estimates, and that information would be useful for the Panel.

141. An application under the FTAA may be declined under section 85(3) if "*adverse impacts are sufficiently significant to be out of proportion to the project's regional or national benefits*". My evidence suggests that the application does not contain enough information to rule out that possibility. In fact, the regional adverse impacts could be significant enough to outweigh the regional benefits. The national adverse impacts could be enough to outweigh national economic impacts if some assumptions about mine performance are too optimistic.

142. In my assessment, the information and analysis in the BOGP application are insufficient to demonstrate a compelling economic case for the project, either at the regional or the national level.

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Appendix A

Example calculations of environmental, amenity, and social impacts

1. In this appendix, I make a few calculations regarding the economic value of environmental, amenity, and social impacts of BOGP. They are not meant to reflect the actual value of impacts of BOGP. They are, instead, examples of how such calculations could be done, and they demonstrate that there is literature focused on non-market valuation of impacts. Conducting the full economic analysis is outside the scope of my work. However, some attempt at non-market valuation of environmental impacts could be made by the economist for the applicant.

Value of impact on wetlands

2. There are economic values that could be applied to the environmental impacts of the application. Perhaps the most straightforward one is for wetlands. The Treasury has determined that the value of a wetland, as the cost of replacing it with something constructed, is $71,500 per hectare per year in 2026 (The Treasury 2025).[70]

3. The application says that the BOGP is expected to increase the total area of wetland, but this involves early loss of some types (seepage wetlands and gully fens) and later gain in another (swamp / marsh wetlands).[71] The economic value of different kinds of wetlands is unknown, but the timing difference between the loss and the rehabilitation is meaningful for a present value calculation.

4. The loss of 3.1 ha of wetland for 30 years has a present value of $2.5 million. The gain of 7.5 ha of constructed wetlands as at year 31 and continuing forever into the future has a present value of $617,000.

5. The benefit cost ratio just for wetlands is 0.25, indicating that the proposed costs are four times the proposed benefits.[72] Further, I understand that Dr Leanne

[70] https://www.treasury.govt.nz/publications/guide/cbax-spreadsheet-model.
[71] AEE, page 316
[72] This result demonstrates the importance of commensurability of impacts (i.e. monetising environment impacts) and making the required calculations. In the Waihi North Fast-track decision, the Panel comments that the development of a conservation area will 'achieve long-term (inter-generational) positive ecological outcomes for the wider area' (p. 315). As a matter of economics, The Treasury has determined that the appropriate discount rate is 8 percent, which assigns a value to inter-generational impacts across every domain of governmental decision-making: health, transport, education, the environment, etc. This discount rate means that impacts 30 years in the future have one-tenth the value of impacts now. The effect is to de-

Morgan in her evidence for EDS has noted the risk of potential complete loss of wetlands.

Value of impact on species

6. Similarly, the project is expected to have negative impacts on several species. The value of individual species has been studied in economics. A meta-analysis of research that assigned economic values to endangered and other species estimated that households in the United States were willing to pay $9 to $168 per year for these species (Loomis and Richardson 2009).

7. Valuation research in New Zealand found that 86 percent of people surveyed were willing to pay for native bird conservation, and estimated that the total value of native bird conservation in the Waikato Region was $13 million in 2008 (Kaval and Roskruge 2009).

8. These and similar studies, although outdated, provide indications of the value of the environment. They do not provide an exact value for valuing the biodiversity impacts detailed in the application, so an illustrative calculation is provided here. The multiple losses noted in the table above and described in the application involve several species and ecosystems. If those impacts collectively had a value of $100 per household per year, the annual value for the two districts is $2.6 million per year, and the present value over 30 years is $29.6 million. To understand the national net benefit, the analysis should be extended to the whole country.

Value of landscape amenity

9. There is research on the value of rural amenity to people in Central Otago, and the role that amenity has played in attracting people and investment. In their case study of Cromwell, Perkins et al. (2015, 92) write that:

> *Amenity migration of permanent, recurrent and temporary residents has been an essential part of the development of the Cromwell District wine region. Our observations and interviews highlighted how the District's*

prioritise inter-generational impacts across these domains. For example, the value of health interventions for newborns has a low present value because the benefits – higher earnings in adulthood – are far in the future. It is inconsistent to prioritise inter-generational outcomes in this specific decision while all these other domains are de-prioritising inter-generational impacts. Thus, making the calculations of the value of costs and benefits using a consistent method ensures consistency within this decision process and across all the other decision processes involving the New Zealand government. For this reason, the application should provide such calculations.

physical and recreational attractiveness has been a stimulus for the arrival of four groups of amenity migrants. They have all exhibited a desire to live, work and/or invest in an attractive and well serviced rural environment.

10. That research did not put a dollar value on the amenity value experienced by residents. For that, research by Ambrey & Fleming (2011) is instructive. They used data from residents in South East Queensland, Australia, including a 10-point scenic amenity scale. They found that a one-point improvement in amenity value was worth AU$12,000 per household per year. Adjusting that figure for inflation (Reserve Bank of New Zealand 2025)[73] and the exchange rate (Australian Taxation Office 2024)[74] produces a result of NZ$12,816 per household per year.

11. The application notes that amenity values will be negatively affected:

    a. "This Landscape Assessment concludes the proposed mining activity will inevitably result in some significant adverse landscape effects during operation".[75]

    b. Overall effects of the proposed mine in the context of the broader Dunstan Mountains Outstanding Natural Landscape are considered moderate adverse'[76]

12. This information establishes that amenity is important in Central Otago (Perkins et al. 2015), that there is expected to be an adverse impacts, and that the value of that impact on landscape amenity could be in the thousands of dollars per household per year. A sample calculation can help inform the CBA. Let us assume that the mine causes households in the Queenstown-Lakes District and Central Otago District to lose one-tenth of one point in landscape amenity value on the scale used by Ambrey & Fleming (2011). There were 26,259 households in those two districts in the 2023 Census (Stats NZ 2026).[77] One-tenth of one point has a value of $1,282. Over the two districts, the value of the reduction in landscape amenity is $33.7 million per year. The net present value of the loss over 30 years is $379 million.

[73] Adjusted from 2011 Q1 to 2025 Q3, the latest quarter available.
[74] Using the rate for 31 March 2011.
[75] Part A, Substantive Application, page 331
[76] Ibid, page 332
[77] Count of households in occupied private dwellings, 2023 Census, Central Otago District (9,723) and Queenstown-Lakes District (16,536), from the Totals by topic for households, (RC, TALB, UR, SA3, SA2, Ward, Health) dataset from Aotearoa Data Explorer.

13. The Richard Meade report also consider the amenity value of the landscape. Using a different method and sources, the report calculates a potential loss of $305 million per year.[78]

Value of social impacts

14. An example calculation can be made for social impacts. For Budget 2025, Radio New Zealand published a short explainer about central government finances (Edmunds 2025). It noted the amount of money the central government spends per capita by category, for example:

    a. Social security and welfare: $6,486
    b. Health: $5,804
    c. Superannuation: $4,352
    d. Education: $4,197

15. The article notes that spending per capita amounts to $37,480. Some of that spending will follow people around wherever they choose to live. Superannuation, for example, follows the person. Transportation spending, at $3,061 per capita per year, tends to be on physical assets in place. A new influx of people would not instantly shift built infrastructure from where they were to Central Otago.

16. For this analysis, let us assume that increased demand and congestion due to the BOGP reduces public resources available to people in the Central Otago District (on a per-capita basis) by one percent. The number of households could increase by 10 percent, and some central government spending will respond quickly to that increase, but some will not. The population of Central Otago in 2025 was estimated at 25,800 (Infometrics 2026). If they experience a one-percent decline in the value of public resources and services available to them, that loss is $375 per person annually and $9.7 million annually for the district. The exact timeframe is unclear, but the Benje Patterson report considers a time period of 16 years. Over the 16 years, the present value of the loss is $85.6 million.

[78] Richard Meade report, pages 63-64