



Te Kuha Mine: Peer Review of Economic Benefit Assessment

Report prepared for:

Department of Conservation

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Status

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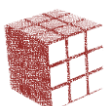




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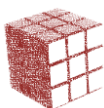
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Summary

Introduction	<p>Ian Dickson & Associates is engaged by The Department of Conservation to peer review the 'Assessment of the Economic Effects of the Te Kuha Mine Project' by Brown, Copeland and Co Limited.</p> <p>The Department is considering two applications in respect of the Mine Project:</p> <ul style="list-style-type: none">• An Access Arrangement for part of the mine pit (13 hectares).• A Concession for approximately 1.6 km of the 6 to 7 km access road.
Relevant legislation	<p>Governing legislation includes the Crown Minerals Act, the Conservation Act and the Resource Management Act. In determining what economic effects are relevant, the statutory language supports both economic impact analysis and net economic (cost-benefit) analysis being considered:</p> <ul style="list-style-type: none">• Economic impacts are jobs, income or other measures of economic activity within a specified geographic area associated with or generated by a project.• Net economic benefit measures how much an economic activity is worth. This is the appropriate technique to use if efficiency of resource use is the economic goal. Economists argue that net economic benefit is the "right" method to use in support of public policy resource use decisions.
Economic Effects Assessment	<p>The Assessment uses the technique of Economic Impact Analysis to calculate how the Mine Project affects the economies of the Buller District and the West Coast Region.</p> <p>Using the stated assumptions we were able to reproduce the calculated results with a minor exception.</p> <p>The principal conclusions of the Assessment are the following:</p> <ul style="list-style-type: none">• Over the 16 year operating life of the Mine project:<ul style="list-style-type: none">– For the Buller District, annual direct impacts will be a \$20 million, 64 FTE and \$4.4 million of wages. Indirect impacts will increase these figures by \$12.3 million, to 82 FTE and \$6.5 million respectively– For the West Coast Region the annual impacts will be \$18.9 million, 90 FTE and \$6.7 million in wages.• During the construction and rehabilitation phases there will be economic impacts corresponding to the activities taking place.• Additionally, the Crown and the Buller District Council will receive royalties, compensation and access payments.
Reviewer's Opinion	<p>Economic Impact Analysis is widely used to study the economic consequences of public policy decisions affecting resource use.</p> <ul style="list-style-type: none">• We were not able to test, so we cannot express an opinion on the business case from which key assumptions about capital costs, operating costs and employment levels were drawn.• The commercial feasibility of the Mine Project, which is a necessary condition for any economic impacts to occur, is not demonstrated in the Assessment.





- The impact attribution at a West Coast region level is consistent with the affected industries. However, the pattern of employment in related and supporting industries to coal mining suggests that a greater impact attribution to the Grey District than to the Buller District may be appropriate.
- Within the underlying and limiting assumptions of the method of analysis, the multipliers used in the assessment are able to be confirmed.

Economic impact analysis is an appropriate technique to use if the decision maker is interested in goals such as local jobs and growth. The statutory language in the relevant Acts also encompasses net economic benefits and efficiency of resource as relevant economic effects.

Using international consensus forecasts for coal prices¹ and a range of commercial assumptions, we have tested the commercial feasibility and risk of the Mine Project. Subject to the usual limitations of such analysis, the Reviewer is able to conclude that the Mine Project is commercially feasible under current and reasonably likely operating conditions and robust to a range of project risks². Therefore economic impacts in the range indicated by the Assessment are possible.

The Reviewer also tested the efficiency of resource use in a national cost-benefit framework with the following conclusions:

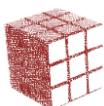
- Using the coal price assumed in the Assessment:
 - The Mine project has a positive net present value at an 8 percent real discount rate (recommended by the Treasury). That is, the present discounted value of benefits associated with the Mine Project exceeds the present discounted value of associated detriments.
 - However the project is no longer 'efficient' if construction suffered delays and/or cost overruns
- Using international consensus coal prices, the Project is robust under all the risk scenarios tested including if the coal recovery is of lower quality (up to 40 percent steaming) or up to 25 percent lower recoveries.

Specific questions The Reviewer's response to the specific questions asked by the Department are as follows.

Whether methods used are robust and appropriate?	<p>The method of Economic Impact Analysis is widely used to measure effects of economic activity within a specified geographic area associated with projects.</p> <p>Economic Impact Analysis is appropriate if the public policy goal relevant to the decision is local economic impacts.</p> <p>When the policy goal is efficiency of resource use economists argue that net economic (cost-benefit) analysis is the 'right' method.</p>
Whether the assumptions and conclusions are	<p>The conclusions of the Assessment about economic impacts on the West Coast economy of the proposed Mine</p> <p>The reviewer's opinion is that the conclusions are</p>

¹ Converted to local currency dollars and adjusted for the cost of transporting coal for the West Coast to Lyttleton.

² Stress tested assumptions include project delay and construction cost overruns as well as quality and volume of coal recoveries.



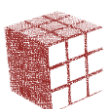


<p>consistent given the methodology?</p>	<p>consistent with the assumptions made (with a minor variation). Commercial viability – a necessary pre-condition for the economic impacts to occur – was not demonstrated.</p>
<p>Are the conclusions reasonable, and if not your views on why and what may be more reasonable?</p>	<p>The estimated direct and multiplied impacts are respectively lower and upper bounds on the likely effects on the economy of the West Coast. However, the reviewer’s opinion is that the efficiency of resource use is equally, if not more relevant to the Minister’s decision on the Applications.</p>
<p>Any other comment/analysis you feel important and/or appropriate given the context of the proposal and potential economic benefits?</p>	<p>The Reviewer has additionally presented high-level analysis in respect of the Mine Project, as follows:</p> <ul style="list-style-type: none"> ● Commercial viability. ● Robustness to project risks, coal recovery, coal quality, and future coal prices. ● Implied costs of coal produced. ● Net national benefit calculation.

Conclusion

The Reviewer is comfortable that, within the limitation of the analysis, the Mine Project:

- Is feasible and robust to risk.
- Has the potential, therefore, to deliver local economic impacts within the ranges calculated in the Assessment.
- On the coal price assumed in the Assessment, the Mine Project has a positive NPV at an 8 percent real discount rate, although delays and cost over runs could make this NPV negative.
- Using instead adjusted consensus forecasts for international coal prices, the Mine Project has a positive NPV in the range \$92 to \$107 million at an 8 percent discount rate.





1. Introduction

Introduction

In September 2014, the Department of Conservation (“DoC” and the “Department”) engaged Ian Dickson & Associates to peer review the ‘Assessment of the Economic Effects of the Te Kuha Mine Project’ (the “Assessment”) by Brown, Copeland and Co Ltd.

The Mine Project consists of a 70 hectare open cast mine sited on a ridge that leads from the lower Buller Gorge up to Mt Rochfort and the Denniston Plateau. The recoverable resource is estimated at 4 million tonnes of high grade coal. The major part of the Mine Project is situated within the Wesport Water Conservation Reserve administered by the Buller District Council.

The Department is considering two Applications in respect of the Mine Project:

- An Access Arrangement under the Crown Minerals Act 1991 for part of the mine pit (13 hectares).
- A Concession under the Conservation Act 1987 for approximately 1.6 km of the 6 to 7 km Access Road over land managed by DoC.

The Applicant, Te Kuha Limited Partnership, commissioned an assessment of the economic effects of the Mine Project in support of its Application for the Access Arrangement and Concession.

Relevant legislation

Three pieces of legislation govern the decision by the Minister of Conservation to grant or decline the Applications. Each Act uses language referring to economic dimensions for the Minister to consider.

The relevant Section 61(2) of the Crown Minerals Act says:

In considering whether to agree to an access arrangement, or variation to an access arrangement, in respect of Crown land, the appropriate Minister, or the Minister and the appropriate Minister, as the case may be, shall have regard to—

- (da) the direct net economic and other benefits of the proposed activity in relation to which the access arrangement is sought.

Section 17S(1)(c) of the Conservation Act requires an application for a concession to include a description of the potential effects of the proposed activity. Section 17P says that the Resource Management Act 1991 also applies to any concession sought under the Conservation Act. The Resource Management Act in its principles refers to economic wellbeing of people and communities as a dimension of sustainable management of resources (Section 5(2)) and requires decision makers to have particular regard to (Section 7 (b))

the efficient use and development of natural and physical resources.

The statutory language invites the Minister to ‘throw the net wide’ when determining what economic effects are relevant to the resource allocation decision sought by the Applicant:

- “Direct net economic ... benefits” and “efficient use ... of ... resources” carries the connotation of Net Economic Benefit (Cost-Benefit) Analysis. Cost-benefit analysis has its foundation in the academic field of analytical welfare economics





and concerns itself with whether a project is the best use of scarce resources³. It also encompasses the concept of risk associated with project outcomes.

There are several applicable "tests":

- Feasibility. Are the financial and technical resources available, or likely to become available, to undertake the project?
- Cost Effectiveness. This test is usually applied when the benefits cannot be reliably translated into monetary terms, or when there is a clear goal for the desired level of effect.
- Net Present Value (of benefits and costs) (NPV). The NPV test encompasses the money values of all favourable effects (benefits) and all unfavourable effects (costs) during the project's life.

Included in benefits and costs are effects that are felt beyond the participants in the project. Also included is 'opportunity cost' of attracting capital. A project with a non-negative NPV is efficient. Among competing projects, the alternative that maximises NPV is also the most efficient.

Implicit in the NPV test is the concept of a discount rate⁴ that both translated future values of costs and benefits to a present value sum, and represents a 'hurdle' return on capital that could be earned if the capital was deployed elsewhere in the economy.

- "Other benefits of the proposed activity" and "development of ... resources" carries the connotation of Economic Impact Analysis. Economic impacts are usually viewed as the expansion or contraction of the economy of a geographic area (nation, region, locality or place) resulting from opening, closing, expanding or contracting a facility, initiating a project, or staging an event. These are impacts on the flow of spending and income and the stock of jobs:
 - Direct economic impacts are the changes in local area business activity occurring as a direct consequence of decision making.
 - There are also broader indirect, induced and dynamic economic effects that may follow from any and all of the above types of direct effects. These are referred to as "multiplier effects".
- The geographic study area is not limited to the area of direct project influence, nor to the 'host' local or regional economy. The Minister's scope in exercising decision rights is limited only by the jurisdiction of national legislation.

Depending on how the geographic study area is defined, certain economic effects will either be internal or external to a locality.

Some projects are motivated by a desire to assist economic development in a place such as to alleviate poverty, and underwrite the sustainability of public services, even if the net impact of the project is a redistribution of income, employment and activity.

³ Scarcity in economics refers to something being hard to obtain, hard to create, or both. Thus it is the production cost of something determines if it is scarce or not. In the biological sciences scarcity can refer to uncommonness or rarity.

⁴ Selection of the appropriate discount rate is an important and sometimes controversial policy issue. The lower the discount rate selected, the more likely will be that projects with high initial costs but benefits far off in the future will pass the NPV tests. The Treasury promotes 8 percent as the real discount rate to be used in cost benefit analysis. A real discount rate has impact of inflation removed and is applied to real cost and benefit flows.





There may also be separate consideration of the broader economic efficiency associated with external impact responses, i.e., will outside parties respond in ways that that will ultimately enlarge or diminish the otherwise-expected local benefits?

-
- Specific questions** In undertaking the peer review of the Assessment, we were asked to consider the following:
- Whether methods used are robust and appropriate?
 - Whether the assumptions and conclusions are consistent given the methodology?
 - Are the conclusions reasonable, and if not your views on why and what may be more reasonable?
 - Any other comment/analysis you feel important and/or appropriate given the context of the proposal and potential economic benefits?

-
- Sources employed** The following sources were employed in this review:
- 'Assessment of the Economic Effects of the Te Kuha Mine Project' by Mike Copeland, Brown, Copeland & Co Ltd, 14 April 2014.
 - National Accounts Input-Output Tables: year ended March 2007', Statistics New Zealand, July 2012.
 - 'Global coking coal price forecast", Metal Expert Consulting, July 2014.
 - 'Potential Contribution of Mining to the West Coast Region' by Jason Leung-Wai and Amapola Generosa, BERL, November 2010.
 - '2011 West Coast Labour Market and Economic Profile, Infometrics, revised June 2012.
 - 'Regional Economic Impacts of West Coast Conservation Land', Butcher Partners Ltd, 31 March 2004.
 - RLB Rider Levett Bucknell "New Zealand Trends in Property and Construction No. 71, First Quarter 2014", prepared by NZIER.
 - 'Public Sector Discount Rates for Cost Benefit Analysis', prepared by the Treasury, July 2008.
 - Scottish Input-Output Tables: Methodology Guide, National Statistics for Scotland, September 2011.
 - 'Appreciating Value, Edition No. 4, September 2013' published by PricewaterhouseCoopers New Zealand ("PwC").

Monetary amounts References to monetary amounts are expressed in New Zealand dollars (NZ\$) and exclude Goods and Services Tax (GST) unless indicated otherwise.

Monetary amounts that have been adjusted for inflation, are denoted with the words 'in 20xx\$' terms, where 20xx is the base year.

Exchange rate At the time this report was drafted the market value of a New Zealand dollar was 0.83 US dollar and at a four-year high. The exchange rate had not adjusted materially to recent downward movement in commodity prices.

For the purpose of the analysis we converted coal prices denominated in US dollar to NZ dollars using an exchange rate lower than the prevailing market rate. Past experience suggests that, when the New Zealand dollar declines from an





unsustainable level, the adjustment can be large. For these reasons we have adopted an exchange rate 20 percent below the then prevailing exchange. By the time the report was completed, the exchange rate had devalued materially, but remained above the rate used by the Reviewer.

Reviewer's credentials

The Reviewer was Ian Dickson. No person other than the Reviewer prepared the analyses, conclusions and opinions regarding the Business Plan that are set forth in this report.

The Reviewer holds an honours degree in economics from Canterbury University. He has attended courses at the IMF Institute in Washington DC and the International Center for Money and Banking (ICBM) in Geneva. He has also completed financial modelling training (Fundamentals of Financial Modelling and Fundamentals of Valuation Analysis) by the investment banking training firm Wall StreetPrep.

The Reviewer's career includes nine years in the NZ Government Treasury, thirteen years in the capital markets and fifteen years as a financial and economic consultant. He has significant experience of advising and acting in mergers, acquisitions and divestments. This experience includes preparing and reviewing the economic analyses and valuations that support the underpinning business cases and plans. He has performed such analyses in many industries including agribusiness, aviation, extractive industries, marine transport, rail transport (metro and freight), banking and finance, construction, electricity generation and distribution, engineering services, forestry, geothermal, ICT, manufacturing, rural services, tertiary education and tourism.

Limitations & disclaimer

The statements and opinions expressed in this report are based on information available as at the date of the report. The Reviewer's opinion has been arrived at based on economic, market and other conditions prevailing at that date.

Such conditions may change significantly over relatively short periods. We reserve the right, but will be under no obligation, to review or amend our report, if any additional relevant information, which was in existence on the date of this report and was not brought to our attention, subsequently comes to light.

In preparing this report, we have not independently verified the accuracy of information provided to us, and have not conducted any form of audit in respect of the Te Kuha Mine proposal.

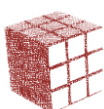
Advance draft

An advance draft of this report was provided to DoC, solely for the purpose of verifying factual matters.

Minor changes were made to the drafting of the report as a result of the circulation of the draft report. There was no alteration to any part of the substance of this report, including the methodology, valuations or conclusions as a result of issuing the draft.

Report structure

The following section of this report presents and overview of the Economic Effects Assessment with our comments and peer review conclusions.





2. Assessment Overview & Comment

Introduction

This section summarises the key points of the Economic Effects Assessment and highlights areas for comment by the Reviewer.

The Assessment uses the technique of Economic Impact Analysis. Economic Impact Analysis involves the use of economic techniques to calculate how a particular project or activity affects the economy of a particular geographic region.

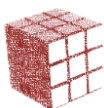
Most commonly, economic impact analysis uses measures of economic impact such as output, employment and income. Such analysis distinguishes between the direct economic impacts (for example, employment or income generated directly in exploiting a resource) and the indirect economic impacts resulting from additional activity created by the project (such as the income earned in unrelated industries as workers spend their income).

Large economic impacts are often considered “good” for regions in need of jobs and income. It is important to note that large economic impacts do not necessarily imply that a project is economically efficient. This is a point we return to later.

Overview

The Assessment is 19 pages in length. It is organised into the following six sections:

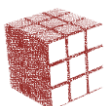
1. Introduction	<p>Provides background material on:</p> <ul style="list-style-type: none"> • The Applicant (Te Kuha Limited Partnership), a joint venture between Stevenson Group Limited and Wi Pere Holdings Limited. Stevenson Group has responsibility for obtaining all necessary approvals for the Project. • The mining permit No. 41-289 held by Wi Pere. • Location and estimate of the recoverable coal (250,000 tonnes per annum over 16 years or 4 million tonnes in total). • Three phases of the Project: 12 month construction followed by 16 years operation and 1 or 2 years of land rehabilitation. • Clear statement of the objective of assessing “the economic effects of the proposed Te Kuha Mine Project”.
2. Economics, The RMA & CMA	<p>This section provides an analysis of the economic meaning of relevant legislation in the Resource Management Act and Crown Minerals Act. While this is the relevant legislation for the Access Arrangement, the Conservation Act is also relevant to the Concession sought by the Applicant.</p> <p>We broadly agree with the analysis of the legislative provisions as presented.</p> <p>We also agree that the analysis of Economic Effects should be wider than the narrow financial effects on the Applicant</p>

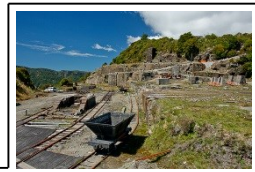




	<p>– with one caveat concerning the feasibility of the project. For the estimated impacts to occur, the Project must first be able to attract the resources necessary for its implementation, i.e., it must pass a commercial feasibility test. We comment further on this aspect below.</p> <p>Where we disagree with the Assessment is confining the viewpoint to the Buller District and West Coast Region. While these may be the relevant Geographic Study Areas for local authorities concerns with granting consents under the Resource Management Act, as explained in the Introduction to this report, the Minister is not restricted to local effects. The statutory language gives weight to economic efficiency as well as to local and regional economic impacts.</p>
<p>3. Buller District & West Coast Regional Economies</p>	<p>This section presents statistics which demonstrate the importance of mining as an employer in the Buller District (23 percent) and as an engine for employment growth in the past decade.</p> <p>For the West Coast as whole, mining jobs make up 8.6 percent of total employment and agriculture and tourism have been the mainstays of the regional economy.</p> <p>The point of this section is that it demonstrates that in a declining population region, mining has successfully rowed against the ebbing tide. With the prospect of industrial closures in cement manufacture, a new mine, will be an important contributor to future economic development.</p> <p>The implication is that ample (labour) resources will be available for the proposed Te Kuha Mine, i.e., the activity jobs and income will be ‘additional’. Moreover, the Assessment concludes that in the absence of the development, the West Coast economy may decline sharply⁵.</p>
<p>4. Economic Benefits of the Te Kuha Mine Project</p>	<p>This section sets out the assumptions that are used in the assessment of economic impacts. Those assumptions are:</p> <ul style="list-style-type: none"> • A 12 month construction period employing 64 full-time equivalent employees (FTE) on a \$4.2 million payroll. Construction costs of \$40 million. • A 16 year operation extracting 250,000 tonnes annually. 44 FTE employees on a payroll of \$4.4 million and \$25 million annual operating expenditure. • At the conclusion of the operation there will be a land rehabilitation lasting 1 to 2 years employing 6 FTE.

⁵ We note the comment by BERL that coal mining on the West Coast faces challenges from the remoteness of the region, fragmentation of the coal resource meaning that mines are unable to achieve the size typical of the industry overseas.



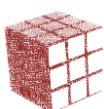


	<ul style="list-style-type: none"> Construction cost attribution splits 50 percent within Buller District and a further 20 percent (i.e., 70 percent in total) within the West Coast Region. Attribution and Multipliers <table border="1" data-bbox="783 427 1225 645"> <thead> <tr> <th></th> <th>Buller District</th> <th>West Coast</th> </tr> </thead> <tbody> <tr> <td>Attribution</td> <td>50%</td> <td>70%</td> </tr> <tr> <td>Output</td> <td>1.23</td> <td>1.26</td> </tr> <tr> <td>Employment</td> <td>1.86</td> <td>2.04</td> </tr> <tr> <td>Wages & salaries</td> <td>1.47</td> <td>1.53</td> </tr> </tbody> </table> <p>Using the stated assumptions we were able to reproduce all but one of the calculated results. We calculated the annual operating benefit for the Buller District at \$15.4 million instead of the Assessment's estimate of \$12.3 million (with a corresponding flow-on to the region).</p> <p>The project will also pay \$8 million of royalties to the Crown, and access payments to the Buller District Council and DoC of \$500,000 and \$85,000 respectively.</p>		Buller District	West Coast	Attribution	50%	70%	Output	1.23	1.26	Employment	1.86	2.04	Wages & salaries	1.47	1.53
	Buller District	West Coast														
Attribution	50%	70%														
Output	1.23	1.26														
Employment	1.86	2.04														
Wages & salaries	1.47	1.53														
<p>5. Potential economic Costs of the Te Kuha Mine Project</p>	<p>The Assessment states that the Project will not:</p> <ul style="list-style-type: none"> Displace economic activity whose expenditure, employment and income would need to be offset. Require investment in roading, electricity, water systems or other infrastructure at a cost to other than the Applicant.⁶ 															
<p>6. Conclusions</p>	<p>The principal conclusions of the Assessment are the following:</p> <ul style="list-style-type: none"> Over the 16 year operating life of the Mine project: <ul style="list-style-type: none"> For the Buller District, annual direct impacts will be \$20 million, 64 FTE and \$4.4 million of wages. Indirect impacts will increase these figures by \$12.3 million⁷, to 82 FTE and \$6.5 million respectively For the West Coast Region the annual impacts will be \$18.9 million⁸, 90 FTE and \$6.7 million in wages. During the construction and rehabilitation phases there will be economic impacts corresponding to the activities taking place. Additionally, the Crown and the Buller District Council will receive royalties and access payments. 															

⁶ Although it is unstated, it is assumed the coal produced will be transported by rail from the West Coast to Lyttleton for export. Neither of the ports at Westport nor Greymouth has the capacity and all weather, all tide access for Panamax-size vessels that transport coal to international markets.

⁷ Our estimate based on the same assumptions is \$3.1 million higher at \$15.4 million.

⁸ Our estimate on the same assumptions is \$22.1 million.





Comment on assumptions

We make the following comments on the stated assumptions that underpin the Assessment:

- **Business Plan.** The key assumptions about construction costs, employment levels, operating costs and coal recoveries is data that will have emerged from a business plan for the Mine Project. The Assessment states at page 14 that the data was supplied by the Stevenson Group.

We have not seen the business plan. Therefore we can venture no comment on the assumptions on which the business plan rests which have been relied upon for the Assessment.

We comment further on the business plan in the context of it being necessary to understand that the Project is commercially feasible as a necessary condition for economic impacts to arise. The business plan will give visibility to key dimensions of feasibility including the potential for cost overruns, variation in coal recoveries (volume and quality) and forecasts for coal prices.

- **Benefit Attribution.** The Assessment assumes 50 percent of output is a benefit to the Buller District and a further 20 percent (70 percent in total) to the West Coast regional economy. The balance of 30 percent is a leakage.

The basis for this assumption is not stated.

In the latest published Input-Output Tables⁹ the cumulative primary inputs to coal mining at a national level are 80 percent value added. Since the West Coast Region is a small part of the national economy it is reasonable that regional value added could be smaller than nationally. The figure used in the Assessment (70 percent for the region) could be conservative.

The related and supporting industries which supply the inputs to coal mining are:

- Non-residential construction.
- Metal product, machinery & equipment manufacturing.
- Mineral processing (Petroleum, Coal, Chemical & Associated Product Manufacturing and Non-Metallic Mineral Product Manufacturing).

According to BERL¹⁰, Grey District accounts for around two-thirds of the West Coast Region's employment in the first two listed sectors. Metal production in the Buller District is not quite 30 percent of employment in this industry. Thus the proportion of the regional impact captured by Buller seem higher than might be expected by the geographic location of affected industries as revealed by employment patterns.

- **Multipliers.** The multipliers used in the Assessment are taken from evidence presented by Geoffrey Butcher¹¹ in support of an application for resource consent to mine coal on the Denniston Plateau.

Input-Output Tables provide data from which output multipliers can be readily calculated on an industry basis. These are estimates of spending impacts assuming continuation of prevailing economic structures, inter-industry trade patterns and local flows of money into and out of the geographical area. Their

⁹ National Accounts Input-Output Tables: year ended March 2007', Statistics New Zealand, July 2012.

¹⁰ 'Potential Contribution of Mining to the West Coast Region' by Jason Leung-Wai and Amapola Generosa, BERL, November 2010.

¹¹ Butcher Partners Limited, Consulting Economists.





magnitudes vary depending on the technology of the industry. The local economy size and industrial structure affect the portion of the impacts that remain in the local economy and the portion that "leaks" to other areas or overseas.

The output multiplier values for most industries are generally between 1.1 and 1.7, with an average value of 1.3 for the extractive and manufacturing industries.

For coal mining, based on the 2007 Input-Output Tables we estimate the output multiplier to be 1.28. This is close enough to the figures used in the Assessment of 1.23 and 1.26 for Buller District and West Coast region respectively.

Generally speaking, multipliers will be larger in larger regions than smaller areas. This is because spending leakages tend to be greater in smaller areas.

Employment multipliers are estimated differently, based on location quotients, for the major employment sectors in the area. Based on the data in Infometrics¹² we can confirm the employment multiplier and wage multiplier Assumptions used in the Assessment.

Reviewer's Opinion

The Assessment is an Economic Impact Analysis. Economic impact analysis is widely used to study the economic contribution of resource use, or to help inform about the consequences of public policy decisions affecting resources.

In the opinion of the Reviewer:

- The calculations presented in the Assessment were able to be reproduced from the assumptions stated (with minor exceptions).
- The commercial feasibility of the Mine Project, which is necessary condition for any economic impacts to occur, is not tested in the Assessment.
- The impact attribution at a West Coast Region level is consistent with the affected industries. However, the pattern of employment in related and supporting industries to coal mining suggests that greater impact attribution to the Grey District than to the Buller District may be appropriate.
- Within the limitations of the underlying and limiting assumptions of Input-Output analysis, the multipliers used in the assessment are able to be confirmed.
- Expressing the economic impact results as point estimates conveys a sense of precision which may be unjustified. For example expressing the economic impact of construction as between 64 and 120 to 130 FTE may assist in countering the natural human tendency towards cognitive bias.
- Economic impact analysis is the appropriate technique to use when the decision maker is interested in goals such as local jobs and growth. For this reason, local politicians and interest groups are most interested in the results of economic impact analysis affecting projects within their areas of interest.

However, the statutory language in the relevant Acts invites the Minister to also consider net economic benefits and efficiency of resource use when determining what economic effects are relevant to the Applications.

To use the results of any economic analysis for a public policy decision, the economic dimensions must logically relate to the actual public policy decision sought. Net

¹² 2011 West Coast Labour Market and Economic Profile, Infometrics, revised June 2012.





Economic Benefit measures how much an economic opportunity is worth. Net economic value is calculated by subtracting total costs (i.e., corresponding to the direct impacts) from total benefits. Net economic value analysis is the appropriate technique to use if you are interested in the goal of “efficiency”. In this context efficiency concerns itself with whether the Mine Project is the best use of scarce resources having regard also to risk associated with project outcomes. For this reason, economists will argue that net economic benefit is the “right” method to use in public policy issues relating to resource use.

High-level net economic value analysis

The Assessment contains enough information to draw some high-level inferences about the implied efficiency of resource use in the Mine Project.

We have made some additional assumptions:

- \$2.2 million cost of land reinstatement in addition to 6 FTE over two years.
- Coal prices (net of transport to Lyttleton from the West Coast approximately \$35 per tonne) based on current consensus forecasts compiled by Metal expert Consulting (see Table 1 below).

Table 1 Coking Coal Price Forecasts

Consensus forecasts at July 2014.

NZ\$ per tonne at Mine Head ¹	2015	2016	Long-term
Consensus forecast	182	195	236
Maximum forecast	221	236	266
Minimum forecast	150	161	206

- Notes:
1. Converted from USD to NZ\$ at an assumed long run exchange rate of 0.66.
 2. Transport to Lyttleton from the West Coast NZ\$35 per tonne

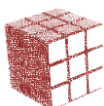
Sources: Metal Expert Consulting.

- For the private financial analysis:
 - General inflation 2.0 percent per annum.
 - Labour cost inflation 2.5 percent per annum.
 - Non-residential construction cost inflation 4.3 percent per annum¹³ for five years and 2.0 percent per annum thereafter.
 - Construction cost confidence level 15 percent.
 - Capitalised construction costs amortised over 16 years.
 - Investor tax rate of 28 percent.
 - Consenting authorities require refundable performance bonds of \$4 million.
 - Long run exchange rate 20 percent below the prevailing rate at the time of writing (USD0.83).
 - Post-tax nominal weighted-average cost of capital (“WACC”) of 8.6 percent¹⁴.
- For the national cost-benefit analysis (royalties and tax excluded):
 - Real discount rate of 8 percent.
 - Real coal price NZD\$140 per tonne¹⁵ at mine head.

¹³ Source RLB Rider Levett Bucknell.

¹⁴ Average of the NZX-listed mining sector, see PwC ‘Appreciating Value, Edition No. 4, September 2013’.

¹⁵ The Assessment implies \$140 per tonne from annual revenue of \$35 million on 250,000 tonnes production.





In Table 2 below we show the results of our high-level private financial analysis of the Mine project. In brief, the analysis shows:

- With a \$40 million construction costs and no delays, the Mine Project has:
 - Estimated cost of coal produced is NZ\$177 per tonne.
 - Estimated enterprise value of \$59 million.
- If the construction is delayed five years and is kept to a 15 percent construction cost confidence margin:
 - Estimated cost of coal produced is NZ\$183 per tonne.
 - Estimated enterprise value of \$47 million.

Table 2 Private Financial Analysis

Cost of coal and enterprise value estimates for a range of Project delay and cost overruns.

Delay/ Overrun	Construct Cost	Cost of Coal	Enterprise Value
	\$m	NZ\$/tonne	\$m
0/0%	40	\$177	59.1
2/15%	50	\$181	51.8
3/15%	52	\$181	50.3
5/15%	57	\$183	47.0

Sources: Ian Dickson & Associates analysis.

- In a stress test of coal production at worst case construction delay and cost over-run, the Mine project could sustain either:
 - 15 percent reduction in recoverable coal; or
 - 27 percent of lower quality coal recoveries, before becoming financially unviable

On this basis, we are able to conclude that the Mine Project is likely to be financially feasible and robust to risk.

In Table 3 below we show the results of our high-level national net benefit analysis.

Table 3 National Net Benefits Analysis

Net economic benefit for a range of Project delay and cost overruns and coal price forecasts.

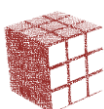
Delay/ Overrun	Construct Cost	NPV at \$140 per tonne	NPV at Consensus Forecasts
	\$m	\$m	\$m
0/0%	40	4.3	107
2/15%	50	-5.0	98
3/15%	52	-7.0	96
5/15%	57	-11.3	92

Sources: Ian Dickson & Associates analysis.

On the assumed coal price used in the Assessment, the Mine Project has a positive NPV at an 8 percent real discount rate. However, we note that small delays and cost over runs would make this NPV negative.

Using instead the consensus forecasts for coal prices, the Mine Project has a positive NPV in the range \$92 to \$107 million at an 8 percent discount rate.

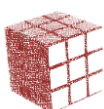
We remind the reader that these estimates are based on information available about currently prevailing economic, market and other conditions. Such conditions may change materially over relatively short periods.





Specific questions The Reviewer’s response to the specific questions asked by the Department are as follows.

<p>Whether methods used are robust and appropriate?</p>	<p>The method of Economic Impact Analysis is widely used to provide estimates of the effects on jobs, income or other measures of economic activity within a geographic area associated with a project. The method has known limitations (as do other methods of economic analysis). The method also has critics, particularly of the use of multipliers: seemingly a turbo charger adding extra power to the economic argument.</p> <p>What may safely be concluded is that the direct impacts and multiplied impacts are respectively lower and upper bounds on the likely effects of the Mine Project on the economy of the West Coast.</p> <p>Whether Economic Impact Analysis is appropriate depends on the public policy goal relevant to the decision, and the relevant legislation.</p> <p>When the policy goal is economic efficiency, i.e., projects should only be undertaken if the benefits exceed the detriments, then the efficiency of resource use in a national cost-benefit framework should also be tested. Economists argue that economic cost-benefit analysis is the ‘right’ method to use in public policy decisions concerning resource use.</p>
<p>Whether the assumptions and conclusions are consistent given the methodology?</p>	<p>The conclusions of the Assessment about economic impacts on the West Coast economy of the proposed Mine Project are consistent with the assumptions made. There is a minor variation in a calculated result between the Assessment and what the Reviewer reproduced.</p> <p>Commercial viability – a necessary pre-condition for the economic impacts to occur – was not tested in the Assessment.</p> <p>However, the Reviewer was able to conclude the Mine Project is likely to be commercially viable and robust to risk.</p>
<p>Are the conclusions reasonable, and if not your views on why and what may be more reasonable?</p>	<p>The estimated direct and multiplied impacts are lower and upper bounds on the likely effects of the Mine Project on the economy of the West Coast.</p> <p>However, the reviewer’s opinion is that the efficiency of resource use is equally, if not more relevant to the decision on the Applications.</p>
<p>Any other comment/analysis you feel important and/or appropriate given the context of the</p>	<p>The Reviewer has additionally presented high-level analysis in respect of the Mine Project, as follows:</p> <ul style="list-style-type: none"> • Commercial viability.





proposal and potential economic benefits?	<ul style="list-style-type: none">• Robustness to project risks, coal recovery and coal prices.• Implied costs of coal produced.• Net national benefit calculation.
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Conclusion

The Assessment is an Economic Impact Analysis. Economic impact analysis is the appropriate technique to use if the decision maker is interested in goals such as local jobs and growth. Local politicians and interest groups are most interested in the impacts emanating from projects within their areas of interest.

In this regard the Assessment may be taken as robust. The calculated direct Mine Project impacts and the indirect and induced impacts are reasonable estimates of the lower and upper bounds on the local economic impacts.

However, the statutory language in the relevant Acts also refers to net economic benefits and efficiency of resource use when determining what economic effects are relevant to the Applications. Economists will argue that net economic benefit is the “right” method to use in public policy issues relating to resource use. Net economic benefits is a framework which logically relates to the economic dimensions of the actual public policy decision sought. In this context the public policy question is whether the Mine Project is the best use of scarce resources having regard also to risk associated with project outcomes.

The Reviewer is comfortable that, within the limitation of the analysis, the Mine Project:

- Is financially feasible and robust to risk.
- Has the potential, therefore, to deliver local economic impacts within the ranges calculated in the Assessment.
- On the coal price assumed in the Assessment, the Mine Project has a positive NPV at an 8 percent real discount rate, although delays and cost over runs would make this NPV negative.
- Using instead the minimum consensus forecasts for coal prices, the Mine Project has a positive NPV in the range \$92 to \$107 million at an 8 percent discount rate.
- The future path of international coal prices is critical.

