Te Kuha Mine Project: Review of the Assessment of Economic Effects

Report prepared for:

Department of Conservation

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Date: 29 June 2016

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Status

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Summary

Introduction	Ian Dickson & Associates was engaged by The Department of Conservation to review the 'Assessment of the Economic Effects of the Te Kuha Mine Project' by Mike Copeland of Brown, Copeland and Co Ltd (the Assessment). The Department is considering an application in respect of the Te Kuha Mine Project (the Project) for an Access Arrangement under section 61 of the Crown Minerals Act 1991 for part of the mine pit (12 hectares). However, the economic performance of the mine is not easily assessed spatially or separately between portions of the mine. Therefore, this review looks at the mine as a whole and will leave attributing proportional benefits to decision makers as they consider appropriate. Relevant governing legislation with regard to the economic merits of the Project (as a whole) include the Crown Minerals Act 1991. In determining what economic effects are relevant, the statutory language supports both economic impacts and net economic benefits being considered. For the economic effects to be delivered there must first be a demonstration of the Project's commercial viability.
Focus of the Assessment	The Assessment: • Focuses solely on the economic impacts of the proposed Project at a regional and local level. • Does not present a business case from which the key assumptions were drawn and from which assessments of commercial viability and robustness to commercial risk would be available. • Does not present analysis of the net economic benefits of the proposed Project. However, the Assessment contains enough information to discern commercial viability and net economic benefit at least at a high level, through the use of a "shadow" financial model.
Commercial viability assessment	We have a more conservative view on the outlook for coal prices over the Project life than the Applicant. Using these more conservative forecasts, we conclude the Project: • Is commercially viable using a standard test. • Is moderately resilient to a plausible range of commercial risks (cost over runs, reduced coal volume and quality). • Is poorly placed to weather a "perfect storm" of risks happening together. Using the Applicant's more optimistic coal price forecasts, the Project demonstrates very good resilience to specific risks and to a "perfect storm".
Net economic benefit assessment	The present value of benefits of the Project of $378 million (in 2016$) exceed the present value of the Project costs ($349 million) by $28.8 million. The benefit-cost ratio (B/C) is 1.1. It is only necessary that the project demonstrate a non-negative NPV to meet the economic efficiency test, which it does. However, only an 8 percent adverse variation in costs or benefits would make the Project borderline.

Using the Applicant's more optimistic coal price forecast, the Project NPV is $140 million (B/C = 1.4).

Economic impacts assessment

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.

Using the stated assumptions, we were able to reproduce the results with arithmetical differences. The multipliers used in the assessment are able to be confirmed.

The mine operating costs include an amount for freight, loading and port costs.

The principal conclusions of the Assessment are shown in the following Table 1.

Table 1 Summarised Direct and Indirect Economic Impacts

On Buller District and West Coast Region Economies during Construction and Operations

Item		Buller District		West Coast Region	
		Cons-truction	Operation	Cons-truction	Operation
			p.a.		p.a.
Increased expenditure	million	$24.6	$7.9	$26.8	$11.6
Additional employment	FTE	56	108	61	118
Additional wages & salaries	million	$2.9	$8.9	$3.1	$8.9

Sources: Brown, Copeland & Co Ltd, Ian Dickson & Associates analysis.

The Crown and the Buller District Council will receive royalties and access payments.

Conclusion

The Te Kuha Mine Project would undoubtedly provide a stimulus to the Buller District and West Coast economies. The extractive sector in the region has experienced closure and mothballing of mines, and faces an uncertain outlook in the face of persistently low international coal prices.

Using coal price forecasts, which are more conservative than the Applicant's forecasts, we conclude the Project is commercially viable, moderately resilient to a range of commercial risks, but poorly placed to weather a "perfect storm". Because of the potential for such commercial risks in the Project there is more risk around the achievement of the economic impacts that would be the case with most business ventures.

While we think the estimates of net economic benefits (borderline efficient) and economic impacts (as adjusted) are fair and reasonable, the exposure of the project to commercial risks means that the realisation of the economic effects is not assured.

1. Introduction

Introduction	The Department of Conservation engaged Ian Dickson & Associates in May 2016 to review the latest assessment of the economic effects of the proposed Te Kuha Mine Project (the Project) by Brown Copeland & Co Ltd (the Assessment[1]). We undertook a similar review of the previous assessment by Brown, Copeland in September 2014. The Applicant, Te Kuha Limited Partnership, commissioned the assessment of the economic effects of the Project in support of its applications for regulatory consents. Our Review tests the estimated economic effects for fairness, reasonableness and likelihood.
Project overview	The Project consists of a proposed 109-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 coking coal. The Project consist of three stages: • Twelve-month development phase. • Sixteen-year production phase. • Up to two-years land rehabilitation phase. • The major part of the Project is situated within the Westport Water Conservation Reserve administered by the Buller District Council. 12 ha of the Project however lies within the Mt Rochfort stewardship area and the Department is considering an Access Arrangement application under section 61 of the Crown Minerals Act 1991 for the 12 ha area.
Tests in governing legislation	For reasons explained in Appendix A, the governing legislation requires three perspectives on economic effects to be assessed: 1. Viability and Risk. The Project must meet a test of commercial viability as a necessary condition for the economic effects to be delivered. For any commercial project to be commercially feasible there must exist in the mind of the developer a reasonable expectation that the project will deliver sufficient revenues over its life to meet creditors, payroll and provide a reasonable return on investment capital[2]. Risk such as delay, cost over-run and adverse market developments usually feature in commercial viability analyses. 2. Economic Efficiency. Net economic benefit analysis is the appropriate technique to measure efficiency of resource use. Efficiency of resource use is a concept akin to "highest and best use". In this context efficiency concerns itself with whether

[1] Assessment of the Economic Effects of the Te Kuha Mine Project prepared for Stevenson Mining Ltd by Mike Copeland, Brown, Copeland & Co Ltd, 9 May 2016.

[2] This test corresponds to a non-negative net present value (NPV) of risk-adjusted free cash flows discounted at the weighted-average cost of capital (WACC) for the industry.

the Project is the best use of scarce resources (labour, capital and natural resources) having regard also to risk associated with project outcomes[3].

3. Economic Impacts.

   Economic impact analysis is concerned with employment, incomes or other measures of economic activity within a geographic area that is associated with, or caused by, a project. There are two main elements to an economic impact analysis: an estimate of the stimulus that serves as the direct impact, and a model[4] of the region's economy that will produce estimates of the knock-on effects of the stimulus[5].

The Assessment focuses solely on regional economic impacts and does not address the tests of commercial viability and economic efficiency at also required under the statutory framework.

Enough information is provided in the Assessment to allow us to model commercial viability and economic efficacy at a high level.

Responses to questions

We sought and obtained clarification from Stevenson Mining about the basis for the coal revenue forecasts mentioned in paragraph 4.6 on page 16 of the Assessment.

Stevenson clarified that:

- The basis is FOB Lyttelton and not mine head as stated in footnote 21.
- The mine operating costs include an amount for freight, loading and port costs.

We have made corresponding adjustments to the analysis.

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 and 9 May 2016.
- National Accounts Input-Output Tables: year ended March 2013, Statistics New Zealand, July 2012.
- Global Coking Coal Price Forecast, Metal Expert Consulting, 2016.
- Regional Economic Impacts of West Coast Conservation Land, Butcher Partners Ltd, 31 March 2004.
- RLB Rider Levett Bucknall New Zealand Trends in Property and Construction No. 78, Second Quarter 2016, prepared by NZIER.
- Appreciating Value New Zealand, Edition No. 6, March 2015, by PricewaterhouseCoopers (PwC).
- Economic Impact Analysis: Methodology and Applications (Studies in Applied Regional Science) (Volume 19) by S. Pleeter (Editor).
- Guide for reporting Coal Activities under the New Zealand Emissions Trading Scheme, Ministry for the Environment.

[3] This test corresponds to a non-negative net present value of benefits and costs measured in a national cost-benefit framework. This framework may include costs and benefits that are external to the project, ignores transfer payments such as taxation, and uses a different discount rate (called the rate of time preference). The analysis is usually conducted in real terms, i.e., with the effect of inflation removed.

[4] Input-Output models that depict inter-industry relationships within an economy are frequently used to derive multipliers of the initial stimulus. Such models represent the reactions of the economy at one point in time.

[5] There is no definitive test for economic impacts at a regional level since such calculations are frequently used to put "numbers" on political strategies related to regional development.

- Carbon Price Forecasts, July 2010 by Covec Economic Consultants for the Parliamentary Commissioner for the Environment.

Report structure

The rest of this report document is structured in sections as follows:

- Section 2 examines the Project in relation to commercial viability and resilience to risk.
- Part I:3 3, examines the efficiency of the resources used by The Project in a standard national cost benefit framework.
- Section 4 reviews the economic impacts on the Buller District and West Coast region economies presented in the Assessment.
- Appendix A contains supporting material relating to the economic effect assessments required under relevant legislation.

In the next section, we discuss the commercial viability of the Project.

2. Commercial Viability and Risk

Introduction

An assessment of commercial viability underpins any assessment of economic effects. A developer must hold a belief that the project will be commercially feasible or he or she would not go ahead, in which case none of the effects would arise.

A business plan for the Project has not been made available. The business plan would normally give visibility to key dimensions of commercial viability including the potential for risks to materialise from cost overruns, variation in coal recoveries (volume and quality) and forecasts for coal prices.

Enough information is provided in the assessment for us to produce a high-level "shadow" financial model to test for commercial viability and robustness to risk.

We present the results of our analysis in this section along with an opinion on viability and in the form of a "shadow" financial model.

What is business viability?

A standalone[6] business is said to be viable when it occupies a place in the market that enables it over the long term to:

- Meet its payroll, tax and creditor obligations as they fall due.
- Maintain and, when necessary, refurbish or replace its operating assets to maintain its operating capability.
- Pay its capital providers a return that meet their expectations.

There are many approaches to financial viability metrics (or its reverse, (the potential for) imminent financial distress), but the most comprehensive full-information metric for business viability employs discounted cash flow (DCF) analysis.

DCF analysis involves calculating the NPV of projected cash flows using a discount rate that reflects the required return of industry participants. The DCF method makes use of all available information about present and future prospects for a business.

In a DCF analysis framework a subject business is said to be viable when the NPV of its projected risk-adjusted free cash flows is non-negative. When the NPV is equal to or greater than zero, the business generates sufficient free cash flow to meet all future operating and capital expenses, and pay investors a return just equal to their weighted-average required return on capital provided.

Testing for business viability requires:

- Constructing a representative DCF model of the subject business using known and plausible data for calibration over a sufficiently long period to capture a full investment cycle.
- Estimating the return required by capital providers to participants in the industry (the industry WACC).
- Identifying plausible variations in business value drivers affected by risk that result in a non-negative NPV. In this context we are most interested in the robustness to risk arising from cost overruns (capital and operating), variation in coal recoveries (volume and quality) and forecasts for coal prices.

[6] A stand-alone business is independent and receives no financial support from shareholders or other organisations.

Shadow financial model

Our shadow financial model is adapted from the information presented in the Assessment as follows:

- The same three-phase assessment is adopted. The project commences in 2017, produces coal 2018-33. Land is rehabilitated in 2034 and 2035.
- Costs and revenues are converted to nominal ($ of the day) using the following price level adjustments:
  - General price inflation: 2 percent per annum.
  - Labour cost inflation: 2.5 percent per annum.
  - Construction costs: 3.8 percent per annum 2017-19 and thereafter at inflation plus 1 percentage point.
- Reinstatement bond of $4.4 million refundable in 2035.
- Company tax rate: 28 percent.
- Weighted average costs of capital (WACC): 10.2 percent in nominal post-tax terms. This is the mining sector averages calculated by PwC in its latest Cost of Capital Report.

Future coal prices

Since 2014 the price of hard coking coal, the benchmark grade for the coal produced by the Project has fallen from over US$150 per tonne FOB to around US$123 per tonne FOB. Higher-grade coking coal makes up an estimated 80 percent of the volumes recoverable.

These grades are currently priced at a premium to the standard coking coal price published by Metal Expert Consulting[7]. This premium is in line with the evidence provided by CRL Energy Ltd[8]. We assume 80 percent of the recoverable coal is priced at a 20 percent premium to standard coking coal while the remaining 20 percent is priced at a 40 percent discount.

Metal Expert Consulting specialises in carrying out market and economic research and publishes forecasts of key input prices along with consensus forecasts collected from investment banks. We have used the forecasts published by Metal Expert Consulting as a basis for estimating prices obtainable by the Project year-by-year over the sixteen-year production period. Metal Expert's view is that production costs will constrain standard prices belowUS$130 per tonne (FOB Australia) by the appearance of new producers (having lower-than-market average production costs), and tighter competition.

Coking coal prices internationally are currently at an eight-year low. The situation in the global market for coking coal is uncertain. The adverse macroeconomic fundamentals are depressing global demand and restraining consumption in China, the largest player in the coking coal market.

There is evidence that coking coal supply is excessive relative to demand. Over the past year the contract prices have been above the spot quotes. According to a number of market participants, prices are unlikely to keep decreasing as they have reached cost level.

Based on this outlook, we forecast an average coal price received for the Project at FOB of US$133 per tonne over the production period. Using an exchange rate of

[7] See metalexpertresearch.com

[8] Dr James Pope, GM South Island, CRL Energy Ltd to Stevenson Mining Ltd, 5 May 2016

0.65[9] NZ$/US$ these covert to an average price received of NZ$205 per tonne.

The Assessment states at paragraph 4.6 on page 16 that the value of coal produced is estimated to be around $65 million per annum. We have clarified with Stevensons that this is measured at FOB Lyttelton. Based on 4 million tonnes of recoverable coal this implies an average coal price of NZ$260 per tonne for the Project, 27 percent above our forecast. This seems optimistic given the depressed state of world market.

Commercial viability

Based upon the assumptions and coal price forecasts discussed above, we estimate the enterprise value[10] of the Project to be $34 million.

That is, the net present value of after-tax revenues and costs discounted at 10.2 percent is $35 million and corresponds to an economic cost of coal of NZ$203 per tonne. A ±2 percentage point variation in the discount rate alters the value of the Project by $5.6 million and -$5.2 million respectively.

Using the Applicant's more optimistic coal price forecasts the enterprise value is $116 million (a ±2 percentage point variation in the discount rate alters the value of the Project by $15 million and -$13 million respectively).

Prima facie, the Project is commercially viable.

Resilience to specific risk

We next test for resilience to a range of specific commercial risks. The risks we investigate are:

- Construction cost overruns of nearly 80 percent would be necessary to make the Project no-longer viable. This rates 4 = Good resilience.
- Operating cost overruns of 15 percent would be necessary to make the Project no longer viable. This rates 3 = Moderate resilience.
- Reduced coal volume recoveries. We estimate 3.49 million tonnes total recoveries is necessary to preserve financial viability, i.e., 13 percent below the estimated total recoveries. This rates 2 = Poor resilience.
- Reduced coal quality recoveries. We have estimated this risk using an assumption that the price received equalled that for standard coking coal (i.e., no premium). In this eventuality the Project becomes borderline. This rates 3 Moderate resilience.

Table 2 Comparison of Specific Risks

Impact on Continued Viability of Selected Specific Risks

Specific Risk	Sustainable Variation		Resilience Score[1]	
	IDA	Appli-cant	IDA	Appli-cant
Construction cost overruns	80%	267%	4	5
Operating cost overruns	15%	49%	3	5
Reduced coal volume recoveries	-13%	-33%	2	4
Reduced coal quality	-14%	-48%	2	4
Overall assessment			3	5

Notes: 1. Resilience scale 1 = Very Poor, 2 = Poor, 3 = Moderate, 4 = Good and 5 = Very good.
Sources: Ian Dickson & Associates analysis.

[9] For the purpose of the analysis we converted coal prices denominated in US dollars to NZ dollars using an exchange rate lower than the prevailing market rate of 0.68.

[10] Enterprise value is an economic measure reflecting the market value of a business. It corresponds to the sum of claims by creditors and shareholders.

- A "perfect storm" arising from a concatenation of specific risks, or stress test[11]. We use the following scenario:
  - A 35 percent construction costs over run (a typical engineering construction cost error margin).
  - Coal production ramps up in years 1, 2 and 3 at 10 percent, 35 percent and 45 percent respectively of full production with no reduction in operating costs. Total recoveries are 3.6 million tonnes.
  - Production costs over run by 10 percent on average.
  - A 10 percent premium on superior grade coal is achieved.

  Under this scenario the project has an estimate negative enterprise value of $48 million, a $82 million change from the best estimate. This rates 2 =Poor resilience equivalent to a 43 percent chance of failure. Unfortunately, there is no independent way of assessing the likelihood of such a scenario eventuating since it largely relates to conditions that will be discovered once work on the mine starts.

  If the Applicant's more optimistic coal forecast is used instead of our forecasts, the enterprise value is reduced to $35 million, a change of $81 million. This rates 4= Good resilience.

We need to caveat this high-level risk assessment to ensure there is not an inadvertent double counting of categories of risk. We are assessing here "unsystematic risk" also known as "specific risk". These are risks that affect the Project's cash flows. This is distinct from "diversifiable risk", which is the type of uncertainty that comes with being invested in an industry. Diversifiable risk is measured in the discount rate (WACC is the assessment of probability of loss or failure common to all investors in the industry).

Opinion on viability and resilience to risk

It is our opinion that the Project is commercially viable. It is moderately resilient to a plausible range of commercial risks. However, in our assessment the Project is poorly placed to weather a "perfect storm" of concatenated specific risks.

Our conclusion is that the Project's commercial viability is at greater risk than would be "run of the mill" for business ventures of its type.

We note, however, that using the Applicant's more optimistic coal price forecasts the Project demonstrates very good resilience to specific risks and to a "perfect storm".

In the next section we examine the efficiency of resources use by the proposed project.

[11] A stress test, in financial terminology, is a simulation designed to determine the ability of a project to deal with an economic crisis, a form of scenario analysis.

3. Economic Efficiency

Introduction	In this section we estimate the efficiency of the resources used by The Project in a standard national cost benefit framework. The measure is net economic benefits. The Assessment does not present estimates of the economic effects of the project using this approach. Enough information is provided to make high-level estimates. Net Economic Benefit measures how much an economic opportunity is worth relative to another opportunity (called the "counterfactual"). If there is not a directly competing project the implicit counterfactual is "do nothing". 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 Project is the best use of scarce resources having regard also to risk associated with project outcomes.
Adjustments to the shadow financial model	The following adjustments are made to the shadow financial model described in the preceding Section of this report: • Taxation, royalties and the reinstatement bond are excluded since they all represent transfers of resources. • Inflation is excluded. • A "shadow price" of greenhouse gas emission is included as a resource cost. This is calculated at 0.385 tonne CO_2e per tonne of coal. It is valued at NZ$24 per tonne CO_2e[12] in 2018 rising at 3 percent per annum in real terms[13]. • The marginal rate of social time preference used to discount future values to a present value amount is 7 percent pre-tax in real terms. This is the current value recommended by the Treasury for national cost benefit analysis of general projects.
Net economic benefits	Based upon the assumptions given above, we estimate the NPV of the Project is $28.8 million (in present value 2016$ terms). In other words, the present value of benefits of the Project ($378 million) exceed the present value of the Project costs ($349 million) by $28.8 million. The benefit-cost ratio (B/C) is 1.1. Using the Applicant's more optimistic coal price forecast, the Project NPV is $140 million (B/C = 1.4). Inclusion of the shadow price for greenhouse gas emission reduces the NPV by $10 million. It is only necessary that the project demonstrate a non-negative NPV to meet the economic efficiency test. Moreover, the inclusion of a cost of greenhouse gas

[12] CO_2e carbon dioxide equivalents. This refers to the atmospheric concentration of greenhouse gases included in the Kyoto Protocol converted into carbon-dioxide equivalents using global warming potential estimates for individual gases.

[13] See Carbon Price Forecasts, July 2010 by Covec Economic Consultants for the Parliamentary Commissioner for the Environment.

	emissions on the national costs benefit analysis will be controversial. We note that even with greenhouse gas emission excluded, only 8 percent adverse variation in costs or benefits would make the Project borderline.
Opinion on economic efficiency	It is our opinion that the Project meets the test for net economic benefits of a non-negative NPV. However, we observe that an 8 percent adverse variation in costs or benefits would make the Project borderline relative to doing nothing. In the next section we review the economic impacts measured in the Assessment.

4. Economic Impacts

Introduction

Economic impact analysis is concerned with employment, incomes or other measures of economic activity within a geographic area that is associated with, or caused by, a source of economic stimulus. There are two main ingredients to an economic impact analysis:

- An estimate of the stimulus that serves as the direct impact.
- A model of the region's economy that will produce estimates of the knock-on effects of the stimulus.

Changes to the Project

The project has changed between the 2014 Assessment and the 2016 Assessment in the following ways:

Construction Phase

- 30 FTE down from 64 FTE.
- Wages $2 million down from $4.2 million.
- Expenditure unchanged at $40 million.

Operation Phase

- 58 FTE up from 44 FTE.
- Wages $5.8 million per annum up from $4.4 million per annum.
- Annual expenditure $28 million up from $25 million.

Rehabilitation Phase

- Unchanged in all respects.

Assessment of cost the economic stimulus

The Assessment is on the basis that costs for coal handling, freight and port charges are an offset against revenues and do not form part of the Project costs. Stevenson clarified for us that Project costs include coal handling, freight and port charges.

Such costs and charges do not materially impact the Buller District and West Coast economies. For this reason, the costs and charges should be excluded from the base stimulus. This affects the production phase of the Project, but does not affect the employment-related impacts. We have adjusted the figures on an assumption of $55 per tonne as the costs and charges.

Assessment of multipliers

The Assessment uses the same multipliers as previously used in 2014. Since that time, Statistics New Zealand has published Input-Output Tables for the year ended 31 March 2013. The industrial structure of mining shown in the new Input-Output Tables has not changed materially from the previous Input-output Tables (31 March 2007).

We are satisfied that the multipliers used in the Assessment remain valid.

Table 3 Multipliers Used in the Assessment

Multipliers are used to model the knock-on effects of the economic stimulus

	2014	2016
Buller District Multipliers		
Output	1.23	1.23
Employment	1.86	1.86
Wages & salaries	1.47	1.47

West Coast Region Multipliers		
Output	1.26	1.26
Employment	2.04	2.04
Wages & salaries	1.53	1.53

Sources: Brown, Copeland & Co Ltd.

Assessment of construction impacts

Table 4 below shows the estimated economic impacts from the 12-month mine construction period by a workforce of 30 full time equivalents (FTE) based in Westport.

Around one-half of the estimated $40 million of non-labour construction costs are spent in the Buller District and another one-third in the rest of New Zealand.

The resulting estimated direct and indirect impacts) for the Buller District economy over the 12-month construction period are therefore:

- Increased expenditure of $24.6 million.
- 56 additional jobs.
- $2.9 million in additional wages and salaries.

The estimated direct and indirect impacts for the West Coast Region economy over the 12-month construction period are:

- Increased expenditure of $26.8 million.
- 61 additional FTE jobs.
- $3.1 million in additional wages and salaries.

Table 4 Increased Economic Activity during Project Construction

Comparing the 2016 and 2014 Assessments

	Units	2014	2016	Change 2014 to 2016
Mine construction period	months	12	12	Nil
Construction employment	FTE	64	30	-34
Construction wages	million	$4.2	$2.0	-2
Construction expenditure				
Total	million	$40.0	$40.0	Nil
In Buller District	million	$20.0	$20.0	Nil
In West Coast Region	million	$8.0	$1.3	-$6.7
Buller District Construction Impacts				
Output	million	$24.6	$24.6	Nil
Employment	FTE	119	56	-63
Wages & salaries	million	$6.2	$2.9	-$3.2
West Coast Region Construction Impacts				
Output	million	$34.7	$26.2	-$8.4
Employment	FTE	131	61	-69
Wages & salaries	million	$6.4	$3.1	-$3.4

Sources: Brown, Copeland & Co Ltd.

Assessment of mine operation impacts

Following the construction phase, the Project is expected to produce around 4 million tonnes of coal over a 16 year operating period.

The mining operation is expected to provide local employment 58 FTE employees earning estimated at $5.8 million per annum.

Other expenditure during the Project's operation is estimated at $28 million per annum, with 46 percent spent within the Buller District and a further 22 percent elsewhere on the West Coast. As explained elsewhere we have adjusted this expenditure to eliminate costs and charges associated with coal handling and freight.

Table 5 below shows the estimated annual economic impacts of the Project on the Buller District and West Coast Region economies during the mine operation (and land rehabilitation) period.

Table 5 Increased Economic Activity during Project Operation

Comparing the 2016 and 2014 Assessments

	Units	2014	2016	Change 2014 to 2016	Revised 2016[1]	Revision[1] change from 2016
Mine operation period	16	years	16	Nil		
Average annual coal output	250,000	tonnes	250,000	Nil		
Operation employment	44	FTE	58	14		
Operation wages	$4.4	million	$5.8	$1.4		
Operation expenditure						
Total	$25.0	million	$28.0	$3.0	$13.8	-$14.3
In Buller District	$10.0	million	$13.0	$3.0	$6.4	-$6.6
In West Coast Region	$5.0	million	$6.0	$1.0	$2.9	-$3.1
Buller District Operation Impacts						
Output	$12.3	million	$16.0	4	$7.9	-$8.1
Employment	82	FTE	108	26		
Wages & salaries	$6.5	million	$8.5	$2.1		
West Coast Operation Impacts						
Output	$18.6	million	$23.6	$5.0	$11.6	-$12.0
Employment	90	FTE	118	29		
Wages & salaries	$6.7	million	$8.9	$2.1		
Land Rehabilitation						
Period	2	years	2	Nil		
Employment	6	FTE	6	Nil		
Rehabilitation wages	$0.39	million	$0.40	$0.0		
Rehabilitation expenditure	$3.75	million	$3.75	Nil		

Notes: 1. $55 per tonne excluded from the base stimulus for coal handling and freight costs and port charges.

Sources: Brown, Copeland & Co Ltd, Ian Dickson & Associates analysis.

In the sixth and seventh columns of the above table are shown our revision to the expenditure impacts arising from excluding coal handling and freight costs from the economic stimulus.

The estimated direct and indirect economic impacts of the Project for the Buller District, during its 16-year operation, are:

- Increased expenditure of $7.9 million ($16.0 million) per annum.
- 108 additional FTE jobs.
- $8.9 million ($8.5 million) per annum in additional wages and salaries.

The estimated direct and indirect impacts for the West Coast Region economy over the 12-month construction period are:

- Increased expenditure of $11.6 million ($23.98 million) per annum.
- 118 additional FTE jobs.

- $8.9 million in additional wages and salaries.

Additional effects

The project is expected to pay fees and site access payments to the Crown and Buller District Council.

Conclusion

In summary, the estimate impacts on the Buller District and West Coast region economies are as follows:

Table 6 Summarised Direct and Indirect Project Impacts

On Buller District and West Coast Region Economies during Construction and Operations

Item		Buller District		West Coast Region	
		Cons-truction	Operation	Cons-truction	Operation
			p.a.		p.a.
Increased expenditure	million	$24.6	$7.9	$26.8	$11.6
Additional employment	FTE	56	108	61	118
Additional wages & salaries	million	$2.9	$8.9	$3.1	$8.9

Sources: Brown, Copeland & Co Ltd, Ian Dickson & Associates analysis.

Appendix A Requirements of Governing Legislation

Introduction

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.

Relevant legislation

The decision on the Access Arrangement will be made under section 61(2) of the Crown Minerals Act which includes economic dimensions for the Minister to consider.

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.

Interpretation

Section61(2)(da) 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 Analysis. This has its foundation in the academic field of analytical welfare economics and concerns itself with whether a project is the best use of scarce resources[14].

  There are several applicable "tests":

  - Viability. 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 rate[15] that both translated future values of costs and benefits to a present value sum, and represents a

[14] 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.

[15] 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

'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.
- 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 will ultimately enlarge or diminish the otherwise-expected local benefits?

future will pass the NPV tests. A real discount rate has impact of inflation removed and is applied to real cost and benefit flows.