KEMESS MINE NORTH EXPANSION: AN ECONOMIC REVIEW OF THE ENVIRONMENTAL IMPACT ASSESSMENT

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Prepared for:
MININGWATCH CANADA
Suite 508, 250 City Centre Avenue
Ottawa ON Canada K1R 6K7

Prepared by:
Pacific Analytics Inc.

Pacific Analytics Inc.
P.O. Box 5103 Stn. B
Victoria, B. C. Canada V8R 6N3
Voice/Fax: (250) 370-1775
Email: pacanalytics@pacificcoast.net
Website: pacificanalytics.ca

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EXECUTIVE SUMMARY

This review of the Kemess Mine North Expansion Environmental Impact Assessment (EIA) was commissioned by MiningWatch Canada, with the objective of examining the underlying assumptions and accuracy of the EIA results. This review is *not* a forensic engineering assessment and, as such, takes the raw data provided by the proponent of the mine, Northgate Minerals, regarding the expected mine operations, employment and input cost requirements, mineral content, construction costs, and the like as correct or the best available at this time. Importantly, this review does not question whether there are more cost-effective alternatives to treating the tailings and waste rock and assumes that the costs for the two alternatives (Option 1 and Option 2) proposed in the EIA are accurate.

Rather, the mandate of this review is to examine the economic implications of the mine, given the stated operational and construction assumptions. Because the EIA presented data and implications in various (often inconsistent) sub-reports, one essential element of the review was to put the raw data and economic implications into easily-understood but comprehensive tables. Over-and-above that, the review was commissioned to examine five aspects of the new mine:

1. The direct plus indirect employment impacts of mining operations over the life of the mine and to contrast these with what the EIA found. Implicit in this task is an examination of the methodology applied by the EIA in developing the indirect impacts;
2. The direct plus indirect impacts of the construction phase (including sustaining capital) of the new mine, contrasting the two alternatives for treating tailings: Option 1 (using Duncan Lake as an impoundment area) and Option 2 (a series of short-term tailing treatments);
3. The long-term viability and profitability of the mine under various assumptions, including both treatment Options and under different metal pricing scenarios. It should be noted that the financial projections were based primarily on data found in the EIA and confirmed with the company; however a number of assumptions did have to be made. Northgate has developed its own financial projections, but when we entered their assumptions on metal pricing (Gold at $US375 and Copper at $1.00) and an exchange rate of $1.45 (or 69 cents), into our model, the profit margin was very low, indicating that our model produces <u>*very*</u> conservative earnings estimates;
4. The anticipated closure and reclamation costs and whether the stated costs adequately reflect the expected real cost of reclamation; and
5. The lost opportunity costs associated with the expansion of the mine.

The major findings of this review are the following:

- Total direct plus indirect employment in British Columbia due to Kemess North *operations* is estimated at 848 (with $43.2 million in payroll). This is in contrast to the EIA which estimated total direct plus indirect employment in British Columbia at 1,450. The EIA did not provide an estimate of expected direct plus indirect payroll.
- Total direct plus indirect employment created in other provinces of Canada is estimated at 508 (with payroll of $25.1 million). In contrast, the EIA estimated employment created in other provinces at 50.
- Total direct plus indirect person-years of employment in British Columbia due to Kemess North *construction* activity (Option 1) is estimated at 1,095 (300 direct and 795 indirect) with $60.7 million in payroll. This is in contrast to the EIA which estimated total direct employment at 175 at peak activity over two years but ignored the indirect impacts.
- Due to the much higher capital cost of Option 2 (($757 million vs $228 million for Option 1) total direct plus indirect employment in BC associated with Option 2 is estimated at 3,698 with additional payroll of $205.9 million. The EIA did not evaluate these impacts.
- The indirect employment impacts in British Columbia of sustaining capital (the capital investment required each year to maintain operations) is estimated at 35 for Option 1 (payroll of $1.9 million per year) and 46 for Option 2 (payroll of $2.5 million per year), The EIA ignored these impacts.
- Assuming Option 1, long-term Gold/Copper prices of US$400/US$1.40, and debt financing of mine construction, projected after-tax) Earnings reach C$799.7 million (NPV of $520.6 million) with an Internal Rate of Return (IRR) of 12.7% which is on par with the average Mining Industry IRR in BC over the last four years of 11%. Under Equity financing, the IRR increases to 16.3%, although the Return on (Shareholder) Equity (ROE) falls.
- Assuming Option 2 is chosen as the tailings treatment alternative and long-term Gold/Copper prices of US$400/US$1.40, the IRR of the mine is negative, suggesting that Option 2 is likely not a viable alternative, even if financed through equity.
- If one assumes Option 1 but with Gold/Copper prices of $US500/$US1.80 (that is, essentially the prices in today's market), then after-tax earnings reach $1,911.5 million over the life of the mine with an IRR of 47.6%, far above the credit-adjusted risk free return of 5.625% and much higher that the generally-accepted required return 10% - 15% of for projects of this nature.

- Under the same metal pricing scenario, but with Option 2 tailings treatment, the IRR is estimated at 7.1%, making the mine borderline viable. Under equity financing, the after-tax IRR increases to 7.3%.
- Closure and Reclamation Costs (estimated by the EIA at $43.84 million for Option 1 and approximately $132 million for Option 2) included (inappropriately, in our opinion) a benefit of $2.5 million in salvage value and ignored a potential $22.5 million cost in stockpile re-handling. Under the Precautionary Principle, these costs should be included.
- Lost opportunity costs in Guide Outfitting and Trapping are minimal compared to the benefits associated with the mine. Nevertheless, there is an expected loss of 3 full-time equivalent jobs (7 headcount jobs) and a loss of $120,000 in total payroll.
- Benefits to First Nations are minimal at this time, although a *Consultation and Accommodation Agreement* is in preparation.

In conclusion, from the data provided and using a generally-accepted view of long-term metal prices, the expected additions to provincial employment (direct plus indirect) average 1,014 per year over the life of the mine (1,589 in all of Canada) and result in an annual average increase in payroll of $52.1 million ($81.0 million in Canada). Under these conditions, it also was found that the Kemess North Expansion is viable and will likely earn profits matching or exceeding "normal" profits (i.e., the risk-adjusted profits required for this project).

If one were to accept an assumption of higher Gold/Copper prices of $525/$1.90 (and that is an assumption not to be taken lightly) then Option 2 would have a viable IRR of 15.3%. The difference between debt-financed Option 1 NPV after-tax earnings of C$1,450 million and debt-financed Option 2 NPV after-tax earnings of C$1,154 million is C$295 million.

One can interpret this value in several ways: first, as the payment the company would have to <u>*receive*</u> in order to be indifferent between Option 1 and Option 2 (their "earnings" would be same under both options) and therefore be willing to undertake Option 2 construction. Alternatively, given that Kemess North - Option 2 (under the optimistic metal prices) earns roughly "normal risk-adjusted" profits (IRR = 15.3%), a second way of interpreting the C$295 million value is that it is the value the company would be prepared to <u>*pay*</u> in order to construct Option 1 (this is, after paying the C$295 million, the company's return under Option 1 would be "normal"). Effectively, then, the C$295 million value is the implicit value of Duncan Lake or, alternatively, it is the "rent" the government could charge in order that shareholders still earn reasonable rate of return on their investment.

1.0 INTRODUCTION

The Kemess Mine South, owned and operated by Northgate Minerals Corporation (Northgate), is an open pit copper-gold mine operating near Duncan Lake, British Columbia, roughly 250 km north of Smithers and 430 km northwest of Prince George. The mine, opened in 1998, produced 18.5 million tonnes of concentrate in 2004 (shipped to Quebec for smelting) equivalent to 303,475 ounces of gold and 78,291,000 lbs of copper. After rail shipping costs and smelting costs are removed, Northgate earned Revenues of US$188.9 million and had net earnings of US$39.2 million.[1] Permanent employment by the mine in 2004 was 350 with another 74 seasonal employees. Excluding shipping and processing charges, the mine purchased goods and services totalling US$109.8 million for operational purposes (cost of sales plus administrative and general) plus an additional approximately US$17.5 million is capital upgrades. Employment and spending impacts are spread all over the province, but a particularly important to northern communities. Under market conditions prevailing in 2004, the mine is expected to continue operations until early 2009 at which time Northgate will have closure and reclamation requirements of US$28.3 million.

In 2001 Northgate identified another ore body (Kemess Mine North), located approximately 5 km north of the present Kemess Mine South and the company is now proposing to expand mining operations to include this new ore body. If developed, the life of the Kemess Mine South would be extended until 2012 (due to a limited milling capacity and ore being delivered from both mines) and the Kemess Mine North would operate from 2006 to 2020.

As part of this expansion, Northgate requires a holding area(s) for tailings and waste rock. In the Environmental Impact Assessment, two options are presented, the first option using Duncan Lake, damming it and using it as an impoundment area, and the second using a series of "temporary" holding sites, including the previous South mine site. The proponent, Northgate, indicates that Option 2 is not viable for both economic and environmental reasons.

The Kemess North Expansion (Option 1) is expected to require an initial capital investment of US$190 million with a further US$110 million in mine-sustaining capital over the 2006 - 2020 period. Employment is expected to remain at approximately the same level as in 2004 while operating expenses are expected to increase by $US20 - $US30 million at peak production.

[1] Northgate Minerals Corporation Annual Report – 2004. www.northgateminerals.com.

2.0 OBJECTIVES OF THIS REVIEW

In commissioning this economic review of the Kemess North Mine Environmental Impact Assessment (EIA), MiningWatch Canada had a number of objectives in mind. These include a review of the data used, an assessment of the estimated employment impacts the new mine will create, an examination of the potential profitability of the project, and finally, how closure and reclamation costs will be covered by the company.

Before defining these objectives in more detail below, it is important to emphasize that this review is completely independent of MiningWatch and that at no time did anyone associated with MiningWatch attempt to dictate the findings. Specifically, there is no attempt in this review to invalidate Northgate's claim that the mine is socially and economically beneficial to northern communities and British Columbia a whole. Rather, the mandate of this review as requested by MiningWatch is to supply an accurate assessment of the economic impacts of the Kemess North Mine, regardless of whether the findings show the mine to be economically favourable. Where economic impacts have been overstated or ignored, either for specific local areas or the province or country, these errors need to be understood and corrected. At the same time, if the economic benefits of the project have been understated or ignored, these too must be recognized. In this way, reasoned MiningWatch, the true economic costs and benefits of the Kemess North Mine can be evaluated against the environmental costs and science-based decisions made about mine permitting and the requirements for closure and reclamation costs.

The objectives of this review are highlighted in more detail in the following.

Objectives:

1. **Data and Assumptions Issues:** The Environmental Impact Assessment presents data and associated impacts at a considerable level of detail in a number of separate sub-reports. Unfortunately, the data/impacts are rarely presented in a concise manner, leading to some confusion and, in addition, not all reports are consistent and it is not always clear which are the correct data. Furthermore, embedded in some analyses are specific assumptions, some of which are inconsistent or unrealistic. One objective of this review is to identify issues with the data and the assumptions and, if possible, to provide more clarity.

> **Note:** This review takes as a given the underlying economic data describing the operating and construction costs, employment requirements, and the production and grade profile of the Kemess North Mine. It *does not* attempt to examine the validity or the reasonableness of these data provided by Northgate.

2. **Assessment of Impacts and Implications**: Based on the raw data and assumptions, the EIA identifies a number of economic impacts and implications. A second objective of this review is to assess the underlying methodology for determining the impacts, check the accuracy of these impacts and, if it is found that the results are not accurate, to provide more accurate estimates.

3. The third objective is to estimate a **projected financial statement** for the years 2006-2020 in order to determine the long-run profitability of the mine and whether these profits exceed "normal" risk-adjusted returns that mining companies require. This is important since Northgate is requesting access to pristine lands presently occupied by First Nations people. Assuming there is sufficient monies for full reclamation, the question then is: should "excess" profits, if they occur, go to Northgate shareholders, to First Nations for the use of their traditional lands, or to the province as "rent" for the use of Crown Land.

   In addition, it is important to understand how sensitive these results are to the two different alternatives proposed to treat tailings and waste, and, as well, how sensitive the financial results are to gold and copper prices.

4. Finally, **closure and reclamation costs** are vital to returning the environment to its pre-mine state (if that is possible). Any underestimate of reclamation costs could affect the ability to reclaim the land fully.

3.0 FINDINGS

3.1 INTRODUCTION

As mentioned earlier, it is not part of the Terms of Reference of this review to examine the validity of the input data provided by Northgate. Consequently, it is assumed that the production, employment and investment costs, the production profile, the estimates of metal content and recovery, and other stated attributes are correct or the best available estimates at this time.

3.2 EMPLOYMENT AND PAYROLL IMPACTS

The major economic/social justification for the Kemess North Expansion is that the mine will generate a large number of relatively long-term jobs in the province, both as direct employment by the mine and indirectly as the result of mine purchases. In addition, the construction of the new mine, although only of a short (2 year) duration, also will create employment opportunities. These jobs and the wages they represent are spread all over the province, although the north of the province will be the major beneficiary.

In this section, these employment effects are examined. Unfortunately, the EIA does not contain one single source identifying the employment and payroll impacts by location.

Rather, there are a large number of references to these impacts, sometimes contradictory, sometimes with definitional differences embedded, which makes it difficult for the reader to appreciate how each location will benefit from the new mine.

One aim of this section will be to put the regional impacts into an easily understood table so that the reader can see very clearly how many direct and indirect jobs from operations and from construction and how much direct and indirect payroll can be attributed to each location. A second aim will be to assess the underlying methodology and the accuracy of the impacts and to provide corrected estimates, if necessary.

3.2.1 Direct Employment and Payroll Impacts

3.2.1.a Operations

The EIA calculates that the number of direct operational jobs expected to be created by the proposed Kemess North mine will be 350 plus another 74 seasonal jobs for a total of 424 operational jobs. The EIA also includes another 125 "contract" jobs as direct employment, however, as explained in more detail in Section 3.2.2 below, those contract jobs are captured as part of the indirect employment impacts and therefore should not be included in the direct employment impact discussion. Corresponding to these 424 jobs is a total payroll of $26.2 million, including employer deductions.[23]

The payroll data for each location are taken directly from the EIA; the regional employment data, however, were not highlighted in a single table or chart in the report, and the EIA often had different estimates for a location throughout the report.[4] Direct employment estimates, therefore, had to calculated, partially based on what was stated in the EIA and partially based on implicit average payroll per employee. As a result, the employment estimates for each location highlighted in Exhibit 1 below could be slightly different in reality, although the total employment figures correspond to totals stated in the EIA as does the regional and total payroll figures.

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[2] The data used for this analysis comes from Appendix 9, page 130 (Figure 9.1 values, the sum of which equal $26.23 million). The same page also cites the figures $25.74 million (with locational values very different from Figure 9.1) and $26 million; Appendix 9, page 135 uses a figure of $26.1 million for wages alone plus another $2.0 million for payroll deductions (the figure of $1.7 million included in Table 9.3 is incorrect; the correct add-up is $2.03 million).

[3] The implicit average wage is $26.2 million/424=$61,790, remarkably low for the mining sector. Even if one ignores the seasonal workforce of 74, the implicit wage is $26.2 million/350=$74,850. This is in contrast to the reported average wage in the overall BC Mining Industry of $94,700 (Appendix 9, page 134).

[4] For example, on page 24 of EIA Appendix 9, employment in Prince George is stated as being 43. However, on page 330 in EIA main report, employment is stated as being 73.

Exhibit 1: Direct Operations Employment and Payroll ($ millions)

	Prince George	Mackenzie/ Fort St James	GVRD/ Sunshine Coast	Kamloops & Cariboo Districts	Bulkley Valley & Stikine	BC Other	TOTAL BC	Rest of Canada	TOTAL
Direct Payroll	$3.2	$0.2	$1.6	$4.7	$5.1	$7.9	**$22.7**	$3.4	**$26.2**
Direct Jobs[1]	*73*	*2*	*43*	*71*	*72*	*113*	***374***	*50*	***424***

[1] Includes 74 seasonal jobs. Equivalent Person-Years (PY) of employment ~= 375.

Exhibit 1 suggests that close to 90 percent of the direct employment and direct payroll occurs in British Columbia, with the benefits being felt all over the province. Not surprisingly, the northern areas of the province benefit more from the employment opportunities than do the southern regions, although the Greater Vancouver area does supply 10 percent of direct employees.

The EIA indicates that this employment level of 424 is the best estimate for long-term employment, but then provides a table of employment requirements by the mine itself (excluding milling and tailings pond staff) that displays some volatility, linked closely to the number of tonnes on ore mined.[5] Estimates of total long-term employment and payroll trends are discussed later in Section 4.0.

3.2.1.b Construction

The proposal to build the Kemess North Expansion includes the construction of the North pit and conveyor system and, as well, two alternatives to deal with waste rock and tailings. The first waste rock/tailings alternative (Option 1) proposes to construct a dam on Duncan Lake and contain all waste rock and tailings in an impoundment behind the dam. Option 2 proposes a series of partial containments, including raising the height of the existing dam to contain some tailings, creating a small tailings dam near the airstrip, filling the existing Kemess South mine with tailing once that mine is mined-out, plus other waste rock containments. These two Options have significantly different costs and economic impacts and each is evaluated below.

Option 1

The pre production construction phase of the Kemess North Expansion with Option 1 is expected to last about 2 years starting in 2006 and has a planned capital expenditure of US$190 million (or $228 million Canadian at today's exchange rate[6]) and an expected workforce of approximately 150 for each year (175 at peak construction).[7] Data provided to

[5] EIA Appendix 1, Table 7.10, page 107

[6] In its 2004 Annual Report and on its website today, Northgate Minerals uses the figure US$190 million as the expected capital investment which, at today's exchange rate of roughly 1.2 equates to C$228 million. This figure is some $50 million lower than the value of C$278 million quoted in the EIA. However, discussions with Northgate indicate that the figure of $278 million was estimated several years ago when exchange rates were quite different from today. This analysis assumes the $228 million figure, although indirect impacts also were generated based on the $278 million figure (see footnote 14).

[7] The EIA indicates that there will be sustaining capital expenditures of $158 million over the life of the mine or some $11.3 million per year. The employment related to this is subsumed under operations employment.

us by the company suggest that overall labour payments for the construction phase will total $18.6 million. Using the figure of 300 person-years of employment (150 jobs times 2 years of construction) this results in an average construction wage of $62,000. The direct construction employment and payroll data are highlighted in Exhibit 2. No breakdown of employment or payroll by location was provided in the EIA, but correspondence with the company indicated that most of the construction labour likely will come from northern BC. As a consequence, we have allocated all labour to BC, although it would be surprising, given Alberta's dominance in oil/gas/mining construction, that Alberta workers would not be employed at Kemess.

Exhibit 2: Direct Construction Employment (PY) and Payroll: Option 1

	BC	ROC	Total
Direct Payroll	$18.6	$0.0	**$18.6**
Direct Jobs (PY)	*300*	*0*	***300***

Option 2

The EIA does not provide any detail on Option 2 construction employment and only a basic timing profile of construction. As a consequence, it is only possible to make a general estimate of the direct impacts of Option 2.

The projected cost (excluding closure costs) of constructing the Kemess North mine with Option 2 is $US631 million which is the equivalent of $757 million Canadian at today's exchange rate.[8] If we assume that the employment-capital split is the same for Option 2 as it is for Option 1, then labour payments would be approximately $67 million while the material purchase cost would be $690 million. Given these labour payments, the total person years of employment would be roughly 1,080. Exhibit 3 details the impacts of Option 2.

Exhibit 3: Direct Construction Employment (PY) and Payroll: Option 2

	BC	ROC	Total
Direct Payroll	$67.0	$0.0	**$67.0**
Direct Jobs (PY)	*1,080*	*0*	***1,080***

3.2.2 Indirect Employment and Payroll Impacts

As well as the direct employment and payroll generated by Kemess North, the mine also will create a number of indirect jobs through the purchase of goods and services. The purchase of goods and services are part of annual operations and, as well, are embedded in the capital investment phase of constructing and maintaining the new mine and tailings dam. These two components are discussed below.

[8] Appendix 3A of the EIA indicates that the capital cost *difference* (including contingency but excluding sustaining capital and closure costs) of Option 2 vs Option 1 is $528.8 million (US$441 million) suggesting that the total capital cost of the Kemess North Expansion with Option 2 is US$441 + US$190 = US$631 million.

3.2.2.a Operations

The EIA states that "spin-off employment opportunities are estimated at 2 times the permanent mine levels (PricewaterhouseCoopers, 2004) or approximately 950 indirect, permanent jobs in British Columbia communities."[9] There are a number of issues with this approach to estimating indirect jobs. First, is the multiplier value of "2" valid? Second, is the methodology of multiplying 2 times the number of direct permanent jobs (350 jobs + 125 contract positions) to estimate indirect jobs correct? And finally, if the above are not correct or the best approach, is there a better approach?

These issues are discussed below:

1. **Spin-Off Multiplier Value**: The EIA uses a "multiplier" of 2 times permanent mine employment to derive the expected number of indirect jobs the Kemess North mine will create. The multiplier value of "2" was taken from a PricewaterhouseCoopers publication.[10] However, as stated in that publication, the value of "2" is itself taken from a study of the BC *forest* industry, making it a less-than-optimal multiplier to use for evaluating mining impacts. Nevertheless, mining multipliers have been used in numerous mining studies, although all such multipliers ultimately have their basis on Statistics Canada's input-output models.[11]

   The best "average" multiplier for a mine such as Kemess North comes from Statistics Canada's British Columbia W-level input-output model for the industry "Gold and Silver Mining". The BC employment multiplier (indirect jobs to direct jobs) for this industry is 1.29; that is, for every direct job in the industry a total of 1.29 additional indirect jobs are created in BC while the all-Canada employment multiplier is 1.66; that is, for every direct job in the industry a total of 1.66 additional indirect jobs are created in all of Canada. As will be seen in 3) below, however, the Kemess mine has quite different characteristics than the "average" gold and silver mine, and so one must treat these multipliers with caution.[12] What is clear, though, is that the use of a multiplier of "2" based on the forest industry is not acceptable.

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[9] EIA Appendix 9, page 143

[10] The Mining Industry in British Columbia – 2003, PricewaterhouseCoopers, 2004.

[11] Input-Output models track all inputs used by businesses, all outputs of those businesses, and all final demand by consumers. The model creates a Supply=Demand identify for every commodity in the economy. Supply of a commodity (equal to production in the economy plus imports) is, by definition, equal to Demand (the use by companies in the production process plus consumption by consumers, plus inventory changes plus exports). An increase in Demand for a commodity must be matched by an increase in Supply, but if the increase in Supply comes from domestic producers, then these domestic producers themselves generate additional demand for the inputs that they need to increase production. A mathematical manipulation of Input-Output model enables one to determine by how much *total* Supply increases when there is a one-time increase in Demand. In terms of Kemess, increased output of gold/copper increases the demand for various input commodities (e.g. machine parts) and the suppliers of these commodities will, in turn, increase their demand for input commodities (e.g., steel), and those producers will also increase their input demands (e.g., for iron ore and energy). By summing all these additional demand impacts an estimate of the *indirect* multiplier of Kemess North is calculated.

[12] See footnote 13 for alternative employment multipliers based on the Copper, Lead and Zinc mining industry.

2. **Spin-Off Multiplier Definition**: The quote above reveals a fundamental mis-understanding of what an indirect job multiplier is and how indirect jobs are calculated. Specifically, the expected number of indirect jobs has *nothing* to do with the level of direct employment. Rather, as described in footnote 11, the number of indirect jobs is a function of the level and types of goods and services purchased by the mine. While the indirect job multiplier is not influenced by the number of direct jobs, it is influenced by the proportion of those goods and services that are imported, either from outside Canada or from other provinces, since imported goods and services don't create employment in the local economy.

   It is important to understand the definition of imports. Imports can come straight from an outside jurisdiction, as when the Kemess mine imports equipment parts from the USA or explosives from Alberta. However, purchases made in BC also can be mostly "imports" as when Kemess purchases fuel oil from PetroCanada in Prince George. In this case, the PetroCanada agent in Prince George receives only the wholesale mark-ups (or margins) on the fuel purchases which are used for his payroll, expenses and (hopefully) some profit. In contrast, it is the producers of the fuel oil (located in Alberta) who receive the fuel oil purchase price. The important point here is that, even though Kemess may be purchasing a large dollar level of goods and services from a particular locale, the impacts on local employment may not be so large. Later in this section, the indirect employment impacts by location will be assessed using, as discussed below, specific purchase data provided by Northgate.

3. **Kemess-Specific Multiplier**: The use of an "average" employment multiplier is useful in cases where there is no accurate information on the level and types of purchases by a mine. However, in the case of Kemess, there are credible purchase details and therefore a more accurate method for determining the indirect multiplier is to run the purchase estimates through Statistics Canada's BC Input-Output model.

   As described in more detail in the Appendix, in Input-Output theory the purchase of a good is comprised of the purchase of a number of different "products". In a nutshell, when a good is purchased (for example, machine parts) the purchase price includes the value of the good at the factory gate, the cost of transportation to the wholesaler premises and eventually to the mine, the wholesaler (and retailer, if any) mark-ups, and finally any taxes related to the purchase. Each of these components of purchasing has its own indirect "impact" and by separating total purchases into individual commodities, a specific multiplier can be estimated. The following provides additional detail on how a Kemess-specific multiplier was estimated.

Data for Kemess North operational input purchases were provided to us by the company for 41 separate commodities, excluding payroll-related expenses and capital expenses. These input expenses total $152.7 million, including $128.6 million in commodity purchases, $3.3 million in direct PST and Fuel Tax payments, and electricity charges by BC Hydro of $20.8 million. The data were broken down by ten locations of purchase, six within BC, three other provinces, and the USA. These input purchases were adjusted for the various margins (e.g.,

embedded transportation margins, wholesale mark-ups, etc.) and import coefficients (from the Rest of Canada and from outside Canada) and run against Statistics Canada's BC Interprovincial Input-Output model. The results are highlighted in Exhibit 4.

Exhibit 4: Indirect Impacts of Kemess North Operations ($ millions)

	Prince George	Mackenzie/ Fort St James	GVRD/ Sunshine Coast	Kamloops & Cariboo Districts	Bulkley Valley & Stikine	BC Other	TOTAL BC[1]	Rest of Canada	TOTAL[2]
Input Purchases	$25.4	$17.2	$16.9	$21.7	$3.1	$1.3	**$85.6**	$38.7	**$128.6**
Indirect Payroll	$6.2	$2.6	$2.2	$1.2	$0.9	$7.2	**$20.3**	$20.4	**$40.7**
Indirect Jobs (PY)	*131*	*57*	*49*	*25*	*20*	*161*	***442***	*435*	***878***

1 BC Total excludes BC Hydro payments and PST/Fuel taxes

2 Total includes purchases from the USA totalling $4.3 million

The results suggest that a total of 878 indirect jobs would be created annually by the Kemess North Mine operations, somewhat less than that suggested in the EIA (950 indirect jobs). However, the 878 indirect jobs include the estimated 125 "contract" positions, while the 950 figure cited in the EIA excluded those "contract" positions, meaning that the EIA estimated total indirect jobs at 1,075.[13] By not using a Kemess Mine-specific employment multiplier based on purchases, the EIA has overstated indirect employment impacts by roughly 23 percent.

The EIA did not provide any estimate of the expected level of indirect payroll the Kemess mine would generate; the Input-Output run suggests a total of $40.7 million would be added to the Canadian economy.

As noted in the quote on page 7, the EIA also stated that these indirect jobs would be created "in British Columbia". The data in Exhibit 4 suggest otherwise. Indeed, because of the rather large value of imports from Alberta and the rest of Canada, the total number of jobs created in BC itself is estimated at 442, or only some 41 percent of that suggested by the EIA. The total payroll accruing to BC communities is estimated at $20.3 million.

Although the EIA did not provide estimates of the indirect impacts at the community level, from an evaluation perspective it is important to know what these potential indirect impacts are, since the employment and salaries earned indirectly are just as important to community members as those generated directly by the mine. Exhibit 4 includes that information for use by the Evaluation Committee. Prince George and the Mackenzie region are the main communities benefiting indirectly from Kemess purchases, although most regions enjoy some benefits.

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[13] The reader may note that the implicit indirect-to-direct employment multiplier is 878/424 = 2.1, a value higher than the "average" mine multiplier of 1.66 (see page 7). This is due to the fact that the Kemess mine uses far more material inputs (which drive indirect impacts) per dollar of output ($0.52 vs $0.40), the effect being to increase the indirect-to-direct employment multiplier. The Copper, Lead and Zinc Mining industry, for example, uses $0.57 of material inputs per dollar of output and has a total indirect-to-direct employment multiplier of 2.6 (2.1 for BC alone).

3.2.2.b Construction

Option 1

As indicated before, the projected cost of constructing the Kemess North mine with Option 1 is $US190 million which is the equivalent of $228 million Canadian at today's exchange rate, of which $18.6 million is for labour and the remainder ($209.4 million) is for capital purchases. Like the purchase of operational goods and services, the purchase of capital goods and services also have indirect impacts on the economy. The company provided additional details on the amount and types of capital goods and services that will be purchased and these were run against Statistics Canada's BC Input-Output Model.

According to this run, the total number of indirect jobs (person-years of employment) is estimated at 1,136 with an associated payroll of $58.1 million. Of this, roughly 795 of those jobs will be created in British Columbia (the remainder in other parts of the Canada) with $42.1 million in payroll.[14] It should be remembered that this employment is not permanent, but rather extends over the two year time period of construction, 2006-2007.

Exhibit 5: Construction Indirect Employment (PY) and Payroll: Option 1

	BC	ROC	Total
Indirect Payroll	$42.1	$16.0	**$58.1**
Indirect Jobs (PY)	*795*	*341*	***1,136***

In addition to pre-production construction, there is also a sustaining capital programme estimated at $130 million, or approximately $9.3 million per annum over the 14 year operating life.[15] While the labour required is subsumed in overall operations employment, the capital spending itself has indirect employment impacts. Assuming the sustaining capital is similar to the pre-construction capital, the number of indirect jobs and the level of payroll generated by the mine *per annum* is highlighted in Exhibit 6.

Exhibit 6: Sustaining Capital Indirect Employment (PY) and Payroll: Option 1

	BC	ROC	Total
Indirect Payroll	$1.9	$0.7	**$2.6**
Indirect Jobs (PY)	*35*	*15*	***50***

Option 2

The projected cost of constructing the Kemess North mine with Option 2 is $US631 million ($757 million Canadian), of which an estimated $67 million is for labour and the remainder ($690 million) is for capital purchases. Assuming Option 2 capital purchases have roughly

[14] This analysis uses the $228 million Canadian estimate for capital costs. If the figure of $278 million Canadian is more accurate, then the indirect impacts should be increased by roughly 20 percent (i.e., the total indirect jobs in BC would be roughly 960 and indirect payroll some $51 million).

[15] EIA Appendix 9, page 143. The original estimate of $158 million is adjusted to today's exchange rate (see footnote 6).

the same normalized indirect impacts as Option 1, the Exhibit 7 below highlights the expected one-time indirect employment and payroll impacts of Option 2 construction.

Exhibit 7: Construction Indirect Employment (PY) and Payroll: Option 2

	BC	ROC	Total
Indirect Payroll	$138.9	$52.6	**$191.5**
Indirect Jobs (PY)	*2,618*	*1,124*	***3,742***

Like Option 1, Option2 has ongoing sustainable capital requirements, in this case equalling approximately $14.7 million (US$12.2 million) per year over the life of the mine.[16] While the direct impacts (employment and payroll) are captured in on-going operations, there are indirect impacts associated with this spending, as highlighted in Exhibit 8.

Exhibit 8: Sustaining Capital Indirect Employment (PY) and Payroll: Option 2

	BC	ROC	Total
Indirect Payroll	$2.5	$0.9	**$3.4**
Indirect Jobs (PY)	*46*	*20*	***66***

3.2.3 Total Employment and Payroll Impacts

Based on the foregoing, estimates of total annual operations employment and payroll (direct + indirect) for each community are presented in Exhibit 9 below.

Exhibit 9: Total Operations Employment (PY) and Payroll Impacts

	Prince George	Mackenzie/ Fort St James	GVRD/ Sunshine Coast	Kamloops & Cariboo Districts	Bulkley Valley & Stikine	BC Other	TOTAL BC[1]	Rest of Canada	TOTAL[2]
Direct Payroll	$3.2	$0.2	$1.6	$4.7	$5.1	$7.9	**$22.7**	$3.4	**$26.2**
Direct Jobs (PY)	*73*	*2*	*43*	*71*	*72*	*113*	***374***	*50*	***424***
Input Purchases	$25.4	$17.2	$16.9	$21.7	$3.1	$1.3	**$85.6**	$38.7	**$128.6**
Indirect Payroll	$6.2	$2.6	$2.2	$1.2	$0.9	$7.2	**$20.3**	$20.4	**$40.7**
Indirect Jobs (PY)	*131*	*57*	*49*	*25*	*20*	*161*	***442***	*435*	***878***
Total Payroll	**$10.8**	**$2.7**	**$3.9**	**$5.9**	**$6.1**	**$13.9**	**$43.2**	**$25.1**	**$68.3**
Total Jobs (PY)[1]	***258***	***61***	***94***	***97***	***93***	***246***	***848***	***508***	***1,355***

[1] Total Jobs includes 74 seasonal direct jobs which reduces Person-Years by ~50.

If the Kemess North Expansion proceeds, British Columbia will enjoy an increase in total employment of approximately 848 each year the mine is in operation and will benefit from an increase in payroll of some $43.2 million annually. Prince George will be the community gaining the most from the mine expansion, but clearly many communities in the province are likely beneficiaries.

Exhibit 10 displays the total construction impacts over the two year construction phase of Option 1. Total person years of employment will reach 1,095 in British Columbia while the

[16] From Appendix 3A, the operating cost *difference* (excluding closure costs) between Option 1 and Option 2 is $48 million over the life of the mine or some $3.4 million per year. In total, then, the sustaining capital costs per year of Option 2 equals $11.3 million (Option 1 costs) + $3.4 million = $14.7 million ($US12.2).

additional payroll added to the BC economy is estimated to be $60.7 million. This impact will take place during the period 2006 to 2007. In addition, sustaining capital expenditures (discussed later) will generate 35 indirect jobs in BC and a payroll of $1.9 million *each year* the mine is in operation.

Exhibit 10: Total Construction Employment (PY) and Payroll Impacts – Option 1

	BC	ROC	Total
Direct Payroll	$18.6	$0.0	**$18.6**
Direct Jobs (PY)	*300*	*0*	***300***
Indirect Payroll	$42.1	$16.0	**$58.1**
Indirect Jobs (PY)	*795*	*341*	***1,136***
Total Payroll	**$60.7**	**$16.0**	**$76.7**
Total Jobs (PY)	***1,095***	***341***	***1,436***

Due to the substantially larger capital investment under Option 2 ($757 million vs $228 million for Option 1), the total impacts are far larger (see Exhibit 11). Total person years of employment will reach 3,698 in British Columbia while the additional payroll added to the BC economy is estimated to be $205.9 million. Since Option 2 construction will take place over a longer period (the construction profile is not specified in the EIA), the employment and payroll benefits are also spread over a longer period.

Exhibit 11: Total Construction Employment (PY) and Payroll Impacts – Option 2

	BC	ROC	Total
Direct Payroll	$67.0	$0.0	**$67.0**
Direct Jobs (PY)	*1,080*	*0*	***1,080***
Indirect Payroll	$138.9	$52.6	**$191.5**
Indirect Jobs (PY)	*2,618*	*1,124*	*3,742*
Total Payroll	**$205.9**	**$52.6**	**$258.5**
Total Jobs (PY)	***3,698***	***1,124***	***4,822***

Sustaining capital spending, estimated at $11.3 million per year for Option 1 and $14.7 million for Option 2 also generates ongoing indirect benefits to the economy (direct benefits are subsumed under operations).

Exhibit 12: Sustaining Capital Indirect Impacts

Option 1	BC	ROC	Total
Indirect Payroll	$1.9	$0.7	**$2.6**
Indirect Jobs (PY)	*35*	*15*	***50***
Option 2			
Indirect Payroll	$2.5	$0.9	**$3.4**
Indirect Jobs (PY)	*46*	*20*	***66***

3.3 PROJECTED FINANCIAL PERFORMANCE

Understanding the expected corporate financial performance of the Kemess North Expansion is important for two main reasons. First, it is important that the mine, if it is constructed, be viable in the long run and earn sufficient "profits" to enable the proper environmental reclamation of the mine, tailings dam, and other affected areas. Second, the mine must be sufficiently viable to allow for proper compensation to First Nations whose land is affected.

3.3.1 Projected Financial Performance – Option 1

The EIA does not provide a single-source description of the expected financial performance of the Kemess North Expansion, but it does provide sufficient information in various sections of the report to enable an approximation of the projected performance of the mine over its life. Exhibit 13 on the following pages highlights this financial performance.

Appendix 1 page 105 (Table 7.9) of the EIA provides details on the expected milling feed per year, the grammes per tonne (gpt) rate of gold and the copper percentage (%) over time and expected recovery rates which enables a projection of the total expected gold and copper production for each year to 2021. Concentrate production is determined using information from Table 8.12 of Appendix 1. Given future gold and copper prices, a time series of expected Gross Revenues can be calculated.

In order to determine Revenues as reported on the company's financial statement, shipping and processing costs need to be subtracted. The EIA does not report expected shipping costs, so future concentrate shipping costs are estimated based on per tonne costs in 2004 times the actual number of tonnes of concentrate shipped each year. Processing costs were reported for 2004 and 2005 in the company's Annual Report, as well as the average over the last five years. For the purposes of projecting Revenues, average processing costs are used from 2006 onward.

Cost of Sales is comprised of the cost of material inputs and salaries (payroll). The cost of the material requirements of the mine itself (i.e., excluding the tailings area, conveyor system, etc.) are indicated in Table 7.9 of Appendix 1. Total material input costs are based on the 2004 costs adjusted for these known material costs. Total material costs differ from year to year, but approximate the estimate of average costs suggested in the EIA of $140 - $150 million Canadian (using earlier exchange rates).[17]

Table 7.9 of Appendix also provides a time series of employment in the mine (excluding the tailings area, conveyor system, etc.). Total employment is based on 2004 employment adjusted for the projected mine employment. Payroll is then based on total employment estimates times average payroll per employee in 2004.

[17] EIA Appendix 9, page143.

Exhibit 13: Projected Financial Performance: Option 1, 2006 to 2021

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mill Feed (millions of tonnes)	**17.3**	**18.6**	**18.6**	**19.0**	**20.4**	**19.2**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**
Concentrates (tonnes)	130,615	150,158	146,412	148,117	182,571	141,382	138,793	213,094	208,564	203,655	169,661
Headgrade	0.220	0.220	0.220	0.220	0.248	0.210	0.115	0.173	0.166	0.159	0.130
Gold (gpt)	0.724	0.702	0.735	0.71	0.732	0.660	0.388	0.389	0.351	0.329	0.262
Gold Recovery	0.701	0.699	0.691	0.66	0.69	0.69	0.69	0.69	0.69	0.69	0.61
Gold Production (oz)	**282,300**	**294,117**	**303,475**	**286,251**	**331,269**	**281,116**	**301,259**	**302,035**	**272,530**	**255,449**	**179,841**
Realized Gold Price (US$/oz)	*$327*	*$356*	*$387*	*$425*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*
Gold Market (US$/oz)	*$310*	*$364*	*$409*	*$450*							
Gross Gold Revenues	**$92.3**	**$104.7**	**$117.4**	**$121.7**	**$132.5**	**$112.4**	**$120.5**	**$120.8**	**$109.0**	**$102.2**	**$71.9**
Copper Concentrate (%)	0.236	0.225	0.231	0.23	0.23	0.231	0.232	0.233	0.234	0.235	0.236
Copper Recovery	0.810	0.824	0.827	0.815	0.83	0.81	0.8	0.82	0.84	0.86	0.88
Copper Production (000 lbs)	**72,900**	**76,177**	**78,291**	**78,354**	**96,580**	**75,443**	**74,704**	**115,687**	**114,201**	**112,469**	**94,494**
Realized Copper Price (US$/lb)	*$0.71*	*$0.81*	*$1.30*	*$1.65*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*
Gross Copper Revenues	**$51.8**	**$61.7**	**$101.8**	**$129.3**	**$135.2**	**$105.6**	**$104.6**	**$162.0**	**$159.9**	**$157.5**	**$132.3**
Gross Revenues	**$144.1**	**$166.4**	**$219.2**	**$250.9**	**$267.7**	**$218.1**	**$225.1**	**$282.8**	**$268.9**	**$259.6**	**$204.2**
Shipping Costs	$20.8	$22.4	$22.3	$23.5	$30.1	$23.3	$22.9	$35.2	$34.4	$33.6	$28.0
Processing Costs & Other	$13.2	$12.4	$9.7	$19.3	$17.3	$13.4	$13.2	$20.4	$20.0	$19.6	$16.4
Revenues	**$110.3**	**$131.4**	**$189.0**	**$208.2**	**$220.3**	**$181.3**	**$188.9**	**$227.2**	**$214.4**	**$206.4**	**$159.8**
Cost of Sales (incl. G&A)	**$83.0**	**$88.3**	**$109.8**	**$112.6**	**$116.3**	**$111.4**	**$139.4**	**$144.9**	**$143.8**	**$134.9**	**$126.5**
Materials	*$66.3*	*$69.5*	*$89.8*	*$91.6*	*$94.4*	*$90.8*	*$114.8*	*$120.7*	*$119.4*	*$112.8*	*$104.7*
Payroll	*$16.7*	*$18.7*	*$20.2*	*$21.0*	*$21.8*	*$20.6*	*$24.6*	*$24.2*	*$24.4*	*$22.1*	*$21.8*
Employment	*424*	*424*	*424*	*424*	*424*	*400*	*477*	*470*	*474*	*429*	*424*
EBITD	**$27.3**	**$43.2**	**$79.2**	**$95.6**	**$104.0**	**$69.9**	**$49.6**	**$82.3**	**$70.7**	**$71.5**	**$33.3**
Depreciation & Depletion	*$25.8*	*$34.1*	*$36.2*	*$37.4*	*$24.8*	*$24.2*	*$22.5*	*$20.9*	*$21.1*	*$23.1*	*$19.7*
Accumulated Deprec.	$0.0	$87.2	$120.5	$158.0	$182.8	$207.0	$229.6	$250.4	$271.6	$294.6	$314.3
Mining Taxes	*$1.3*	*$1.4*	*$2.3*	*$2.5*	*$2.7*	*$2.2*	*$2.3*	*$2.7*	*$2.6*	*$2.5*	*$1.9*
Interest	*$4.6*	*$3.6*	*$3.0*	*$1.5*	*$3.8*	*$8.1*	*$7.6*	*$7.4*	*$6.6*	*$6.0*	*$6.2*
Accretion of Site Closure	*$0.3*	*$0.6*	*$0.9*								
Income Taxes	***$0.0***	***-$2.6***	***$2.6***	***$5.7***	***$9.4***	***$1.9***	***-$1.8***	***$5.1***	***$2.9***	***$2.8***	***-$4.1***
Earnings (after taxes) ($US)	**-$4.7**	**$6.1**	**$34.1**	**$48.5**	**$63.3**	**$33.5**	**$19.0**	**$46.2**	**$37.5**	**$37.2**	**$9.6**
Earnings (after taxes) ($Can)	**-$7.4**	**$8.6**	**$44.4**	**$60.6**	**$75.9**	**$40.2**	**$22.8**	**$55.4**	**$44.9**	**$44.6**	**$11.5**
Capital Acquisitions											
Total Capital Assets	$251.4	$257.9	$275.4	$285.4	$383.4	$483.4	$491.1	$498.9	$506.6	$514.4	$522.1
of which additions to P & E	$19.9	$12.9	$17.5	$10.0	$8.0	$7.8	$7.8	$7.8	$7.8	$7.8	$7.8
Exchange Rate	1.57	1.40	1.30	1.25	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Processing Charge ($US)	$65	$55	$43	$85	$62	$62	$62	$62	$62	$62	$62

Exhibit 13 (continued)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL 2006-2021	NPV 2006-2021
Mill Feed (millions of tonnes)	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**9.1**	**503.7**	
Concentrates (tonnes)	170,865	153,132	194,199	228,778	298,148	308,100	192,939	372,434	19,012	3,195,328	
Headgrade	0.130	0.117	0.149	0.177	0.230	0.237	0.148	0.288	0.057	0.0	
Gold (gpt)	0.231	0.235	0.291	0.333	0.432	0.266	0.223	0.517	0.146	0.0	
Gold Recovery	0.61	0.61	0.61	0.61	0.68	0.61	0.61	0.68	0.61	0.0	
Gold Production (oz)	**158,563**	**161,308**	**199,748**	**228,577**	**330,561**	**182,587**	**153,071**	**395,602**	**26,056**	**3,759,572**	
Realized Gold Price (US$/oz)	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	0.0	
Gold Market (US$/oz)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0.0	
Gross Gold Revenues	**$63.4**	**$64.5**	**$79.9**	**$91.4**	**$132.2**	**$73.0**	**$61.2**	**$158.2**	**$10.4**	**$1,503.8**	**$1,055.7**
Copper Concentrate (%)	0.237	0.238	0.239	0.241	0.243	0.245	0.247	0.249	0.251	0.0	
Copper Recovery	0.89	0.89	0.89	0.89	0.9	0.91	0.92	0.92	0.92	0.0	
Copper Production (000 lbs)	**95,973**	**86,740**	**110,928**	**132,877**	**176,054**	**184,937**	**117,710**	**230,913**	**11,978**	**1,831,688**	
Realized Copper Price (US$/lb)	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	0.0	
Gross Copper Revenues	**$134.4**	**$121.4**	**$155.3**	**$186.0**	**$246.5**	**$258.9**	**$164.8**	**$323.3**	**$16.8**	**$2,564.4**	**$1,679.2**
Gross Revenues	**$197.8**	**$186.0**	**$235.2**	**$277.5**	**$378.7**	**$331.9**	**$226.0**	**$481.5**	**$27.2**	**$4,068.2**	**$2,734.9**
Shipping Costs	$28.2	$25.3	$32.1	$37.8	$49.2	$50.9	$31.9	$61.5	$3.1	$527.6	$349.3
Processing Costs & Other	$16.5	$14.9	$18.9	$22.4	$29.4	$30.6	$19.3	$37.4	$1.9	$311.7	$205.5
Revenues	**$153.0**	**$145.8**	**$184.2**	**$217.3**	**$300.1**	**$250.5**	**$174.9**	**$382.6**	**$22.1**	**$3,228.9**	**$2,180.1**
Cost of Sales (incl. G&A)	**$136.8**	**$124.7**	**$117.4**	**$120.7**	**$126.1**	**$106.1**	**$119.1**	**$102.4**	**$2.6**	**$1,872.9**	**$1,307.2**
Materials	*$114.1*	*$103.7*	*$97.2*	*$100.0*	*$104.4*	*$87.3*	*$99.8*	*$85.3*	*$0.0*	*$1,549.4*	*$1,080.9*
Payroll	*$22.8*	*$21.0*	*$20.1*	*$20.7*	*$21.6*	*$18.8*	*$19.3*	*$17.0*	*$2.6*	*$323.5*	*$226.3*
Employment	*442*	*408*	*391*	*402*	*420*	*365*	*375*	*331*	*50*	*415*	
EBITD	**$16.2**	**$21.1**	**$66.9**	**$96.6**	**$174.0**	**$144.4**	**$55.8**	**$280.3**	**$19.6**	**$1,356.0**	**$872.9**
Depreciation & Depletion	*$20.7*	*$21.8*	*$23.1*	*$24.6*	*$26.6*	*$29.1*	*$33.0*	*$40.8*	*$58.0*	*$433.9*	*$279.7*
Accumulated Deprec.	$335.0	$356.8	$379.8	$404.5	$431.0	$460.1	$493.2	$533.9	$591.9	*$0.0*	
Mining Taxes	*$1.8*	*$1.8*	*$2.2*	*$2.6*	*$3.6*	*$3.0*	*$2.1*	*$4.6*	*$0.3*	*$38.9*	*$26.3*
Interest	*$6.8*	*$8.4*	*$9.8*	*$10.2*	*$9.5*	*$6.9*	*$4.9*	*$5.6*	*$0.0*	*$107.8*	*$73.8*
Accretion of Site Closure	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$36.5*	*$0.0*	*$0.0*
Income Taxes	*-$7.9*	*-$7.4*	*$1.2*	*$6.7*	*$21.8*	*$16.0*	*-$2.1*	*$41.0*	*-$13.0*	*$72.5*	*$42.6*
Earnings (after taxes) ($US)	**-$5.2**	**-$3.4**	**$30.6**	**$52.4**	**$112.5**	**$89.3**	**$17.8**	**$188.3**	**-$62.1**	**$666.4**	**$433.8**
Earnings (after taxes) ($Can)	**-$6.3**	**-$4.1**	**$36.8**	**$62.9**	**$135.0**	**$107.2**	**$21.4**	**$226.0**	**-$74.5**	**$799.7**	**$520.6**
Capital Acquisitions											
Total Capital Assets	$529.9	$537.6	$545.4	$553.1	$560.9	$568.6	$576.4	$584.1	$591.9	**$298.5**	**$254.0**
of which additions to P & E	$7.8	$7.8	$7.8	$7.8	$7.8	$7.8	$7.8	$7.8	$0.0	$108.5	$73.1
Exchange Rate	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20		
Processing Charge ($US)	$62	$62	$62	$62	$62	$62	$62	$62	$62		

Subtracting Cost of Sales from Revenues yields Earnings before Interest, Taxes and Depreciation (EBITD). Depreciation is based on the level of depreciated Capital Assets remaining and the proportion of ore milled to total ore remaining. Mining Taxes are based on Revenues earned. Interest is based on the value of Capital Assets multiplied by the LIBOR interest rate plus 1%, adjusted for a small repayment of outstanding debt based on previous years' net earnings.[18] Finally, Income Taxes are based on historical taxes paid on EBITD less Depreciation charges, Mining Taxes paid and Interest payments.[19]

The projected financial performance of the Kemess North Expansion suggests that the mine will earn sizeable after-tax Earnings over the period[20], totalling some US$666.4 million (Net Present Value[21] - NVP of US$433.8 million) or $799.7 million Canadian (NVP $520.6 million) at the projected exchange rates. Based on invested capital of US$298.5 million (initial capital plus sustaining capital) financed through debt, the mine's projected internal rate of return (IRR) equals 12.7%.[22] In comparison, the Mining Industry in BC in 2004 had Capital Assets of $4,187 million and Earnings of $1,125 million[23] giving an IRR on Assets in 2004 of 27%. The Industry IRR average over the previous four years has been 11%. The credit-adjusted risk-free rate of return is estimated at 5.625%[24], while, because of the inherent risks associated with mining activities, the mining industry usually has a required return rate of 10% - 15% per year.[25]

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[18] Northgate Annual Report, page 31.

[19] Because income taxes payable is highly influenced by tax rates, valuation allowances and previous losses, estimating tax liabilities is difficult. For example, according to Northgate Minerals 2005 Annual Report (page 35) the corporation has C$72.6 million of non-capital losses and C$173.5 million of capital losses both of which can be used for tax reduction purposes.

[20] It is our understanding that Northgate prepared such a financial projection for use in negotiations with their bank and therefore is restricted. We have been told that the gold price used in the projection was set at $375, the copper price at $1.00 and the exchange rate at 1.45. Using these figures in our financial model generates a small negative Internal Rate of Return suggesting that our Earnings and IRR forecast is *very* conservative.

[21] Net Present Value is equal to the discounted value of a cash flow (such as earnings) at a given discount rate (in this case, 5%). $NPV = CF_1 + CF_2/(DR) + CF_3/DR^2 + \ldots + CF_n/DR^{n-1}$ where CF_1 = Cash Flow in Year 1, DR = Discount Rate and DR^n = the Discount Rate to the n^{th} power.

[22] IRR and ROE are calculated based on earnings from 2007 onward, under the assumption that most of the earnings in 2006 are due to operations at the Kemess South mine.

[23] The Mining Industry in British Columbia – 2004, PricewaterhouseCoopers, 2005, Appendix 2A

[24] Northgate Annual Report, page 32.

[25] The required rate of return differs from mine to mine, depending on circumstances. Indian and Northern Affairs, in developing a new mining royalty system for the Northwest Territories, uses an IRR of 13% for low profit (per tonne of ore) gold mines (www.ainc-inac.gc.ca/ps/nap/discpap/obj_e.html). Additional risks include (at a minimum): permitting risks (after all the exploration and feasibility work, will the mine be given development permits?); development risks (can the mine be constructed as envisaged?); operation risks (are operation costs accurate?); and commodity pricing risks (will the prices for the output be realized as expected?). The Kemess North Mine Expansion, because many of the expected construction and operation costs are better understood than in a brand new mine, and because the down-side risks for gold and copper prices are relatively small, likely will need a required rate of return less than 13%.

Another measure of profitability is Return on (Shareholder) Equity (ROE), effectively the rate of return that shareholders are earning on their investment. In 2004, the BC Mining Industry had a ROE of 29.4%; the average over the last four years was 11.9%.[26] In 2004, the Kemess Mine had a ROE of 19.9%. The estimated ROE of the Kemess North Expansion as detailed in Exhibit 13 and assuming that the mine expansion is funded entirely through debt (i.e., no additional equity is issued and equity remains at 2004 levels), is projected at 7.2%. Under Equity financing, these return rates change, with the IRR increasing to 16.3% (from 12.7%) while the ROE falls to 2.6%.[27]

3.3.2 Projected Financial Performance – Option 2

The effect of Option 2 is to change the level and timing of capital investment which, in turn, will have the financial effect of increasing depreciation costs and (assuming debt financing) interest costs. This, in turn, reduces overall earnings. Appendix B highlights this projection of financial performance.

Using exactly the same production profile, costing and metal prices as Option 1, but substituting Option 2 capital costs and sustaining capital investment, the Kemess North Mine is estimated to have Earnings of just US$20.2 million (NVP US$55.1 million) and because the profile of positive earnings is tilted toward the end of mine life and capital spending toward the startup of the mine, the estimated IRR is actually negative as is the ROE. Even under Equity financing (i.e., no additional debt and debt payments) both the IRR and the ROE remain negative.

Although we believe that the financial profile developed for this review is conservative (see footnote 20), there is no doubt that the additional capital costs of Option 2 combined with relatively low metal prices make the Kemess North Expansion uneconomical with this Option.

3.3.3 Sensitivity Analysis – Option 1

Forecasted Earnings and rates of return are highly sensitive to the underlying assumptions used in the financial projections, and the most important assumption is that of metal prices. In the projections highlighted in Exhibit 13, gold is assumed to sell for US$400 per oz over the 2006-2021 period while copper fetches US$1.40 per lb.

Gold at present is in the US$500 range and copper is at US$1.80, and Northgate in its Annual Report of 2004 was bullish on the long term price prospects of both metals. Using a gold price of US$500 and a copper price of US$1.80 (with all other assumption remaining the same) results in estimated Earnings of US$1,592.9 million over the 2006-2021 period ($1,911.5 million Canadian), resulting in an IRR of 47.6% (see Appendix C for the projected

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[26] The Mining Industry in British Columbia – 2004, PricewaterhouseCoopers, 2005, Page 20

[27] Shareholder Equity increases due to the issuance of new shares and an increase in retained earnings. In the analysis, retained earnings do not increase but are used for the sustaining capital investment or dispersed to shareholders and therefore the increase in Equity is equal to the increase in Capital investment.

financial performance under these more optimistic metal prices). Assuming debt financing rather than equity financing (that is, that equity remains at 2004 levels), the ROE would reach 30.6%. If one assumes that Equity is issued for the full cost of the project (US$190 million) rather than financed by debt, then the IRR increases to 50.7% and the ROE falls to 17.1%.

This metal price sensitivity analysis tells us that, not surprisingly, metal prices are key to earnings and that, given the upside potential for long-term increases in metal prices, the Kemess North Mine has a bright future for Northgate Minerals.

3.3.4 Sensitivity Analysis – Option 2

Although under base conditions of gold at $400 and copper at $1.40, Option 2 has a negative IRR and ROE, using the higher gold and copper prices of $500 and $1.80 results in a somewhat different picture (see Appendix D). Specifically, under these more optimistic metal prices, after-tax Earnings reach US$1,122.6 million (NPV of US$784.6 million) or $1,347.1 million Canadian (NVP of $941.5 million). This translates into an IRR of 7.1% and, under debt financing, a ROE of 5.0%. Under Equity financing, the IRR increases to 7.3% while the ROE falls to -5.9%.

Again, the assumptions regarding metal prices play a huge part in determining the earnings performance of the Kemess North Mine. It was shown earlier that Option 2, under base case metal prices, was not financially viable. However, under the more optimistic metal price forecast, after-tax Earnings are reasonable and the IRR, although not matching the average returns for the overall Mining Industry in BC in 2004 (27%), still comes close to the average IRR over the last four years (11%).

3.4 CLOSURE AND RECLAMATION COSTS

The closure of the Kemess North Mine, expected in 2021, will require a major financial commitment in order to prevent long-term damage to the environment and to reclaim lands that were disturbed when the mine was created. Specifically, closure and reclamation will endeavour to prevent metal leaching and acid rock drainage (ARD) from the tailings and mine waste stored in the Duncan Lake Impoundment and within the North Pit, to ensure that water quality objectives downstream of the Duncan Lake Impoundment are satisfied, and to re-establish habitats surrounding the mine, including the tailings beaches.

The EIA uses a mine closure estimation spreadsheet (Mine Reclamation and Costing Spreadsheet – MRCS version 3.5.1) developed by the BC Ministry of Energy and Mines to estimate the required closure and reclamation costs. The spreadsheet provides detailed estimates of the one-time costs for reclaiming disturbed areas ($1.59 million), the capital cost of ARD treatment ($3.05 million), the one-time cost of decommissioning site equipment and structures ($0.98 million), and the annual costs of operating the ARD plant and general site monitoring and water testing ($1.11 million or $37.11 million in Present Value terms). This yields an expected closure and reclamation requirement of $43.84 million, effectively what

the company needs to post as a reclamation bond to ensure closure and reclamation will be properly funded.

While the mandate of this review does not include a forensic examination of the reliability of these estimates, three issues stand out of which the Evaluation Committee should be aware.

- First, the cost of decommissioning assumes that the decommissioned equipment will have a salvage value of $2.5 million. While this may be true, the expectation of receiving this salvage value should not be construed as a guarantee, and therefore the full costs of decommissioning should be included in the require reclamation bonding.

- Second, the estimated closure costs do not include low grade stockpile re-handling. The EIA indicates[28] that in the event of an early shutdown (due to say, low metal prices) as much as 45 Mt of low grade ore in stockpile would have to be moved into the Duncan Lake Impoundment for flooding. These costs were estimated but not included in the overall cost estimate because the cost "would unrealistically make up over 95% of the total of all lump sum items." No indication of this cost is provided. Nevertheless, the EIA did provide a preliminary estimate for this cost of stockpile handling based on Kemess South re-handling costs. This estimate is $0.50 per tonne or $22.5 million in the event the 45Mt stockpile figure is realized. Since there is a generally-accepted public view that activities that impact the environment should follow the Precautionary Principle, completely ignoring this cost is unwise. Indeed, the Precautionary Principle would dictate that the full $22.5 million be included in the Reclamation Bond requirement.

- Third, the EIA states that "the workforce will be initially large" and that "closure workforce estimates are expected to maintain many of the people from operations."[29] Total initial closure and reclamation costs are estimated at $5.62 million, the bulk of this directed to the capital costs ($3.05 million) of constructing the ARD plant. It seems unlikely then that closure activity will employ a "large" number of people.

Although the EIA does explicitly specify the anticipated closure and reclamation costs for Option 2, Appendix 3A highlights the various costs associated with Option 2 costs, including closure costs. According to these data, Option 2 closure and reclamation costs are some $88 million higher than those for Option 1.

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[28] EIA Appendix 12, page 70

[29] EIA Appendix 9, page 132-33.

3.5 LOST OPPORTUNITY COSTS

The expansion of the Kemess Mine to the North Pit and Duncan Lake generates a significant benefit to the province in terms of employment and payroll. At the same time, the existence of the mine will reduce opportunities for other activities. Some of these activities are non-commercial in nature (e.g., hiking, personal angling and hunting) and therefore there is no "economic" impact, although of course there would be a reduction in social utility. Theses are well-documented in the EIA. There are some activities that do generate economic impacts and that will be affected by the mine expansion; the two main activities are Guide Outfitting and Trapping.

3.5.1 Guide Outfitting

According to the EIA, one Guide Outfitting territory (Robert Fleming's) will be purchased by Northgate and withdrawn from hunting.[30] While details on the exact value of this Guide Outfitting territory were not provided in the EIA, a detailed study of the Guide Outfitter Industry in British Columbia provides sufficient information to determine the economic impacts of losing this activity.[31] Based on Fleming's specific number of hunting days and detailed regional financial characteristics for Region 7 (Peace-Omineca), Fleming's Guide Outfitting territory had revenues of approximately $200,000 in 2002 or, in 2004 dollars, perhaps $210,000. In round numbers, this reflects employment of 2 full-time positions (6 headcount jobs), payroll of $90,000 and total material purchases also of approximately $95,000 per annum. The purchase of material inputs equates to indirect impacts of .75 jobs and a payroll of $30,000 per year. Exhibit 14 displays these annual impacts.

Exhibit 14: Annual Guide Outfitting Impacts

	BC	ROC	Total
Direct Payroll	$90,000	$0	**$90,000**
Direct Jobs (PY)	*2*	*0*	***2***
Indirect Payroll	$30,000	$0	**$30,000**
Indirect Jobs (PY)	*0.75*	*0.00*	*0.75*
Total Payroll	**$120,000**	**$0**	**$120,000**
Total Jobs (PY)	***3***	***0***	***3***

3.5.2 Trapping

According to data from the BC Ministry of Agriculture and Lands, the total value of trapping in Peace-Omineca (region 7) in 2002-2003 was $475,000. Given the recent rise in pelt values, this would equate to some $500,000 in 2004. There are 72 traplines in Region 7, suggesting that the average trapline generates around $7,000 per annum in income to the holder of the trapline. The EIA indicates that one trapline holder is likely to be affected by

[30] According to the EIA, two other Guide Outfitters may be "marginally" affected by the Kemess North Mine Expansion. It also is possible that the withdrawal of Mr. Fleming's territory from hunting will *increase* the value of hunting in nearby areas. This is because the non-hunting territory will act as a "large mammalian reservoir" resulting in increased protection and eventually greater numbers of animals.

[31] *The Guide Outfitting Industry in British Columbia: An Economic Analysis of 2002*, prepared by Pacific Analytics Inc. for the Guide Outfitters Association of British Columbia, 2003

the Kemess North Expansion, and that person has been compensated. While there may be some indirect impacts associated with trapline activity, the economic value would be small.

3.6 FIRST NATIONS ISSUES

It is not part of the mandate of this review to examine the impacts, either economic or social, on First Nations. The EIA did provide an estimate of the number of First Nations people employed by the mine, both directly and through a First Nations catering firm (40 direct jobs, 10 contractor jobs) and it is expected that this number would stay the same or increase. It should be noted that, since the preparation of the EIA there has been a sizable decrease in unemployment rates in the north of BC and a concomitant shortage of trained tradesmen which should bode well for First Nations people seeking employment at the mine if training is available.

The EIA emphasizes the importance of education and training and the importance of financial assistance from the company in order to increase human capacities and employment opportunities. It is also noted that a *Consultation and Accommodation Agreement* between Northgate and the 4 Nations affected by the mine is in preparation and, once signed, should mitigate the impacts of mine expansion on traditional territories.

The EIA speaks of compensation for First Nations trapline holders, but it does not appear that there is any explicit compensation for the use of traditional territories and particularly for the use of Duncan Lake. Indeed, First Nations are balking at the *Consultation and Accommodation Agreement* precisely because of the Duncan Lake issue. As such, the economic benefit of the mine to the local First Nations is relatively small at this time.

4.0 CONCLUSIONS

Assuming that Option 1 is chosen as the preferred alternative, Exhibit 15 lays out the employment and payroll impacts on a year-by-year basis. The average number of jobs created in Canada per year, including both direct and indirect, is estimated at 1,589 with average payroll reaching $81.0 million. Of this, 1,014 jobs will be in BC each year with an associated payroll of $52.1 million. Peak employment will occur in 2006 and 2007 when most of the pre-production construction takes place.

In contrast, the EIA estimated total annual employment in BC at 1,449 with another 50 jobs in the rest of Canada. The difference is due to three errors in measuring impacts. First, the method for developing the indirect operations employment impacts was incorrect and this review provides a better approach and estimate. Second, all of the indirect jobs were allocated to British Columbia, whereas almost 50 percent of indirect operations jobs are actually created in other provinces. Third, for some reason, the EIA did not include the indirect impacts of the pre-production construction nor did it include the ongoing indirect impacts of sustaining capital purchases. The net result is that, even with ignoring the

construction and sustaining capital indirect impacts, the EIA overstated total employment impacts in BC by over 40 percent, although the EIA estimate of total Canada-wide employment impacts is approximately 10 percent too low.

The development of a projection of financial performance under varying assumptions has enabled a critical examination of after-tax earnings and return on investment. The results suggest that the Kemess Mine North will be a financial success, even under fairly conservative metal prices. If long-term metal prices remain at levels they are today, the profitability of the Kemess North Mine will be substantially higher than average profitability in the BC Mining Industry even in good times (e.g., 2004) and far higher than what is needed to meet risk-adjusted ("normal") return requirements of investors.

The financial projections also show that Option 2 under conservative metal pricing is not viable but under optimistic metal pricing would come close to meeting (although not quite) the risk-adjusted returns that investors would require (although we do believe that our financial projection model is conservative). Increasing metal prices to US$525 for Gold and US$1.90 for Copper, on the other hand, would result in a sufficient risk-adjusted return (15.3%) under Option 2 conditions.

In the latter case, increasing metal prices to $525/$1.90 results in overall after-tax NPV earnings of C$1,154.0 million under Option 2 conditions and C$1,450.0 million under Option 1, or a difference of C$295 million. This difference can be interpreted as:

> **a)** the payment the company would have to *receive* in order to be indifferent between Option 1 and Option 2 (their "earnings" would be same under both options), and therefore be willing to undertake Option 2 construction, or as
>
> **b)** the value the company would be prepared to *pay* in order to construct Option 1 (that is, after paying the C$295 million, the company's return under Option 1 would be the same as under Option 2 (15.3%) a rate of return considered "normal"). Effectively, then, the C$295 million value is the implicit value of Option 1 (the use of Duncan Lake) to Northgate Minerals or, alternatively, it is the maximum "rent" the government could charge in order that shareholders still earn a "normal" rate of return on their investment.

Exhibit 15: Time Series of Total Employment (PY) and Payroll

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Direct Employment	424	424	424	424	566	558	477	470	474	429	424	442
Operations	*424*	*424*	*424*	*424*	*424*	*400*	*477*	*470*	*474*	*429*	*424*	*442*
Construction	*0*	*0*	*0*	*0*	*142*	*158*	*0*	*0*	*0*	*0*	*0*	*0*
Indirect Employment	791	752	877	869	1,450	1,474	1,070	1,218	1,202	1,141	1,029	1,107
Operations	*791*	*752*	*877*	*869*	*912*	*826*	*1,019*	*1,168*	*1,151*	*1,091*	*979*	*1,057*
Construction	*0*	*0*	*0*	*0*	*538*	*598*	*0*	*0*	*0*	*0*	*0*	*0*
Sustainng Capital	*0*	*0*	*0*	*0*	*0*	*50*	*50*	*50*	*50*	*50*	*50*	*50*
Direct Payroll	$26.2	$26.2	$26.2	$26.2	$35.0	$34.5	$29.5	$29.0	$29.3	$26.5	$26.2	$27.3
Operations	*$26.2*	*$26.2*	*$26.2*	*$26.2*	*$26.2*	*$24.7*	*$29.5*	*$29.0*	*$29.3*	*$26.5*	*$26.2*	*$27.3*
Construction	*0*	*0*	*0*	*0*	*$8.8*	*$9.8*	*0*	*0*	*0*	*0*	*0*	*0*
Indirect Payroll	$36.7	$34.8	$40.7	$40.3	$69.8	$71.4	$49.8	$56.7	$55.9	$53.1	$47.9	$51.6
Operations	*$36.7*	*$34.8*	*$40.7*	*$40.3*	*$42.3*	*$38.3*	*$47.2*	*$54.1*	*$53.4*	*$50.5*	*$45.4*	*$49.0*
Construction	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$27.5*	*$30.6*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*
Sustainng Capital	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*
TOTAL EMPLOYMENT	**1,215**	**1,176**	**1,301**	**1,293**	**2,016**	**2,032**	**1,547**	**1,688**	**1,676**	**1,570**	**1,453**	**1,549**
Operations	*1,215*	*1,176*	*1,301*	*1,293*	*1,336*	*1,226*	*1,496*	*1,638*	*1,625*	*1,520*	*1,403*	*1,499*
Construction	*0*	*0*	*0*	*0*	*680*	*756*	*0*	*0*	*0*	*0*	*0*	*0*
Sustainng Capital	*0*	*0*	*0*	*0*	*0*	*50*	*50*	*50*	*50*	*50*	*50*	*50*
TOTAL PAYROLL	**$62.9**	**$61.0**	**$66.9**	**$66.5**	**$104.8**	**$106.0**	**$79.3**	**$85.7**	**$85.2**	**$79.6**	**$74.1**	**$78.9**
Operations	*$62.9*	*$61.0*	*$66.9*	*$66.5*	*$68.5*	*$63.0*	*$76.7*	*$83.2*	*$82.6*	*$77.0*	*$71.6*	*$76.3*
Construction	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$36.3*	*$40.4*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*
Sustainng Capital	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*

									Total	BC	Total Average	BC
	2014	2015	2016	2017	2018	2019	2020	2021	2006-2021	2006-2021	2006-2020	2006-2020
Direct Employment	408	391	402	420	365	375	331	50	**6,582**	**5,841**	**439**	**389**
Operations	*408*	*391*	*402*	*420*	*365*	*375*	*331*	*50*	***6,282***	***5,541***	***419***	***369***
Construction	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	***300***	***300***	***20***	***20***
Indirect Employment	998	1,001	1,070	1,200	1,074	1,020	1,144	50	**17,249**	**9,062**	**1,150**	**604**
Operations	*948*	*950*	*1,020*	*1,150*	*1,024*	*970*	*1,094*	*0*	***15,357***	***7,738***	***1,024***	***516***
Construction	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	***1,136***	***795***	***76***	***53***
Sustainng Capital	*50*	*50*	*50*	*50*	*50*	*50*	*50*	*50*	***756***	***529***	***50***	***35***
Direct Payroll	$25.2	$24.2	$24.8	$26.0	$22.6	$23.2	$20.5	$3.1	**$406.8**	**$355.8**	**$27.1**	**$23.7**
Operations	*$25.2*	*$24.2*	*$24.8*	*$26.0*	*$22.6*	*$23.2*	*$20.5*	*$3.1*	***$388.2***	***$337.2***	***$25.9***	***$22.5***
Construction	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	***$18.6***	***$18.6***	***$1.2***	***$1.2***
Indirect Payroll	$46.5	$46.6	$49.8	$55.9	$50.0	$47.5	$53.3	$2.6	**$808.5**	**$425.6**	**$53.9**	**$28.4**
Operations	*$43.9*	*$44.0*	*$47.3*	*$53.3*	*$47.4*	*$44.9*	*$50.7*	*$0.0*	***$711.7***	***$355.4***	***$47.4***	***$23.7***
Construction	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	***$58.1***	***$42.1***	***$3.9***	***$2.8***
Sustainng Capital	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	***$38.7***	***$28.1***	***$2.6***	***$1.9***
TOTAL EMPLOYMENT	**1,406**	**1,392**	**1,472**	**1,620**	**1,439**	**1,395**	**1,475**	**100**	**23,831**	**15,203**	**1,589**	**1,014**
Operations	*1,356*	*1,341*	*1,422*	*1,570*	*1,389*	*1,345*	*1,425*	*50*	*21,639*	*13,580*	*1,443*	*905*
Construction	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1,436*	*1,095*	*96*	*73*
Sustainng Capital	*50*	*50*	*50*	*50*	*50*	*50*	*50*	*50*	*756*	*529*	*50*	*35*
TOTAL PAYROLL	**$71.7**	**$70.8**	**$74.7**	**$81.8**	**$72.6**	**$70.7**	**$73.7**	**$5.7**	**$1,215.3**	**$781.4**	**$81.0**	**$52.1**
Operations	*$69.1*	*$68.2*	*$72.1*	*$79.2*	*$70.0*	*$68.1*	*$71.1*	*$3.1*	*$1,099.9*	*$692.5*	*$73.3*	*$46.2*
Construction	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$76.7*	*$60.7*	*$5.1*	*$4.0*
Sustainng Capital	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$2.6*	*$38.7*	*$28.1*	*$2.6*	*$1.9*

APPENDICES

APPENDIX A: INPUT-OUTPUT ANALYSIS

National Accounting (also termed Economic Accounting) assumes a company undertakes two steps in its production process. First, it purchases material inputs from other industries; and second, it transforms those material inputs into finished goods (or services), ready for resale. Take as an example a Restaurant. Restaurants buy fresh vegetables, meat, etc. from the Agriculture sector. Using other material inputs (e.g., electricity, cooking oil, etc.), it transforms them into finished dishes, which, in turn, are sold at a selling price higher than the cost of its inputs. The difference between the selling price and the material input cost is the "mark-up" or "value-added". This value-added is used to pay for the kitchen and wait personnel, any taxes levied by governments, the depreciation of equipment, any interest costs the restaurant may have, and will also generate, the owner hopes, a profit.

National Accounting asserts that the value which the restaurant sector adds to the economy (hence, the term "value added") is equal **not** to the total revenues of Restaurants, but only to this "mark-up" value. That is, the value of an industry to an economy is the difference between the value of its output (effectively, total operating revenues) and the cost of its material inputs. In this way, the Restaurant industry does not claim the value of the agriculture inputs it uses, which should rightly be accounted for by the Agriculture industry. As a result, there is no double counting when measuring the value of the entire economy.

In other words: the value-added of the Guide Outfitting Industry is the revenue from all of its sales to clients (output) minus all of its costs for payments to other firms for goods or services (material inputs), or:

Value Added = Output (or Final Sales) - Material Inputs

Another way of defining value added is that it is the sum of an industry's payments to employees, for indirect taxes, for depreciation and interest costs, and for profit:

Value Added = Labour + Indirect Taxes + Depreciation + Interest Costs + Profit

The resulting value-added of any firm (or industry) is available to be shared among labour (wages, salaries and benefits), indirect taxes and "operating surplus." The operating surplus itself is shared between payments for the use of physical capital (depreciation), payments for the use of monetary capital (interest costs), and payments (profits) to the owner(s) of the enterprise. Value-added is an industry's contribution to, or ***direct impact*** on, the economy. And the sum of value-added of all industries is termed the country's Gross Domestic Product (GDP).

An important distinction needs to be made between Financial Accounting and National Accounting. Under financial accounting, an industry which has a high value added (i.e., contributes a lot to the economy), can be unprofitable if, for example, its payments to labour or for interest costs are too high. Alternatively, low value-adding industries can be very profitable to their owners, depending on their usage of labour and their capital structure.

Economists have standardized the measure of these flows and the inter-relationships of inputs and outputs among industries through the concept of Input-Output (I/O) analysis. The **MAKE** matrix identifies the various types of output the sector produces. The **USE** matrix (the bottom section of that same table) highlights all of the various types of inputs used to produce that output.[32] One can readily determine from these tables that subtracting total Material Inputs from total Output leaves Gross Domestic Product (GDP). This GDP is equal to the sum of Wages and Salaries, Benefits, and Operating Surplus.

The GDP-to-Output ratio is a measure of the direct contribution to the economy *per dollar of output*. Clearly, an industry that requires a lower dollar value of inputs to produce a given dollar of output is a higher value-adding industry. One must note, however, that a higher GDP-to-Output ratio does *not* imply that the industry is more important to the economy. It merely states that for every dollar of output the impact on the economy is greater. Obviously, when examining an industry's importance to an economy one must also take into account the total output of the industry. There is, however, another important characteristic of an industry that must be examined if one is to determine the importance of a sector to the local economy: its ***linkages*** to other industries.

When inputs such as fresh produce or meat are purchased by the Restaurant sector, the industries supplying those goods and services (in this case farmers, food manufacturers, and food wholesalers and retailers) increase their own economic activity. This increased activity itself creates demand for other products. Farmers, for example, may need more fertilizers for their land and more petrol to run their machinery. Food wholesalers may require additional box material. The demand for extra fertilizers and petrol and box material will, in turn, stimulate activity in the fertilizer, petrol and box industries. The increased activity in the fertilizer industry will create greater demand for its own inputs, perhaps some chemicals. And so it continues down the chain of industries. The sum effects of all this additional economic activity are known as ***indirect impacts***.

Such indirect impacts (also known as "multiplier effects" or "spin-offs") on the economy clearly are important. They should not be ignored (as they usually are with financial accounting) if we are to measure the true benefits of an industry to an economy. An interesting observation is that, while it is true that high value-adding industries have low indirect impacts, those industries with relatively lower direct impacts have relatively higher indirect impacts. This is because, by definition, low value-adding industries consume more inputs per dollar of output and thus have a greater impact on their supplying industries. It should be noted, however, that the level of indirect impacts is highly influenced by the type of goods and services demanded and by the propensity of the companies (or the economy) to import those particular goods and services. The higher the propensity to import the required

[32] Output is closely associated with industry revenues and client spending, but there are important differences. Likewise, the inputs used by the Guide Outfitting Industry are highly related to industry expenses. But, again, the differences are important. For a summary of these differences, see the next sub-section: *Technical Differences*.

goods and services, the lower will be the effects on the local economy. Indeed, an industry that imports all its inputs will have virtually no indirect impact on the economy, save the small level of distributive activity (wholesale, retail and transportation margins) the imports may generate.

Increased industrial activity has a third effect on the economy. When additional wages and salaries are paid out, those dollars (appropriately adjusted for taxes and savings) are available to be re-spent on consumer goods and services. Take, for example. an additional $1 million in wages resulting in say, an increase of disposable income of $750,000. Depending on the spending patterns, this may result in extra consumer spending of say, $500,000 in the retail sector (the remaining being spent in the entertainment sector, restaurant sector, etc.). This will increase the economic activity of the manufacturers and other suppliers of consumer goods who, in turn, will increase their own employment and their own wage payments. The sum effects of this additional activity due to increased wages are known as ***induced impacts***. Again, it should be clear that, like indirect impacts, induced impacts are highly influenced by the economy's propensity to import, as well as by taxation and savings rates, the level of wages paid to employees and the level of capacity at which the economy is operating.

The question arises: given that there are many levels of indirect and induced spending which affect many, many different firms and industrial sectors, how can we estimate these impacts on the economy? Fortunately, economists have developed a method to estimate these impacts, by using the same input-output tables to which we already have been introduced.[33] However, since the base information is coming from financial statement data directly provided by operators, it is critical to understand how financial statement data are re-structured to meet National Accounting standards. These differences are discussed below.

Technical Differences

Although the National Accounting (Input-Output) measurement of the value and impacts of Guide Outfitting begins with the same set of data as the financial results of the industry, a number of adjustments are required in order to conform to strict National Accounting standards. To avoid possible confusion, these technical differences between Financial Accounting and National Accounting should be understood. The intent here is not to provide a comprehensive or definitive discussion of these differences, however, but rather to provide a cursory overview. For a more in-depth discussion of the differences and of the methodology underlying National Accounting, the interested reader is referred to the National Accounting compendium published by the UN.[34]

The following outlines the major differences:

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[33] For a detailed discussion of the underlying mathematics of Input-Output analysis, see *Input-Output Analysis: Foundations and Extension*, Ronald E. Miller and Peter D. Blair, Prentice Hall, 1985

[34] *System of National Accounts*, Statistical Papers Series F No 2 Rev. 4, New York, 1993

1. The first and perhaps most important difference is that National Accounting measures all non-tax related revenues and expenses related to production, even those not itemized on the corporate income statement. Hence, gratuities paid to staff are included as output (in the case of the Guide Outfitting Industry, as an increase in sports revenues). This increases output but not material inputs, and therefore it increases the estimate of GDP (Output – Inputs) by precisely the amount of gratuities. Using our other definition of GDP (GDP = indirect taxes + wages, salaries and benefits + operating surplus), we see that the increase in GDP is reflected in an increase in wages and salaries equal to the reported gratuities.

2. Another (usually) off-budget item is an estimate of the value of imputed room and board. On the Output side there is an increase in lodging revenues and, since the provision of room and board is a value to the employee, it is considered equivalent to a wage subsidy, and thus contributes to overall GDP. Normally, the cost of food is already accounted for within the financial statement, thus the net impact on GDP is equal to the value of the imputed room and board. Statistics Canada has standard values that it uses to assess the value of this room and board and it is that standard that is used in this report.

3. At the same time, National Accounting omits revenues not directly related to the production process. Generally, these incomes are limited to interest and dividend earnings, but include non-operating revenues related to rental incomes, commissions and the like.

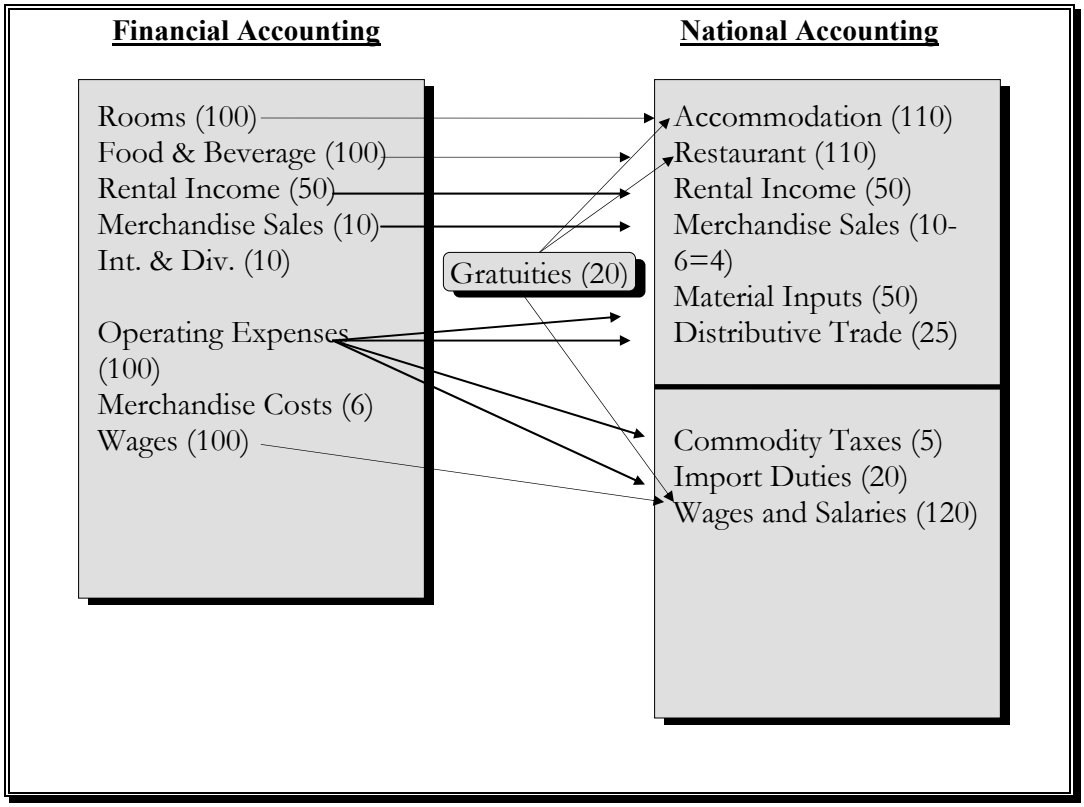
4. A third difference is that, under National Accounting, the value of each input in the USE matrix is stated in "producer" prices. That is, all wholesale, retail, and transportation costs included in the "purchaser" price of a commodity are removed, as are all commodity taxes, indirect taxes and import duties. These "distributive and tax margins," as they are called, are explicitly recognized in the USE matrix as separate line items. The reader should understand that this does not in any way reduce the total cost of inputs to the industry; it simply re-assigns the costs to different input categories.

5. A fourth difference lies in the treatment of merchandise sales. National Accounting treats the purchase of merchandise as partly a purchase from the manufacturer of the good (equal to the cost price of the good less distributive and tax margins) and partly a purchase from the retailer (equal to the mark-up for the good). Consequently, in an input-output table for a sector selling some retail goods, there is no recognition of the cost of the merchandise on the input (USE) side, and only the mark-up value is recognized on the output (MAKE) side. The cost of the merchandise is captured in the Manufacturing sector as output. It is for this reason that some analysts recognize certain manufacturing industries as **direct** tourism, even though tourists do not actually buy any goods directly from those manufacturers.

6. Related to this unusual approach to merchandise sales is the treatment of "service margins." When a firm purchases a product (such as liquor, beer or wine) and re-sells it with a mark-up without any fundamental change to it, National Accounting recognizes only the mark-up or "service margin" as output. It then treats the purchase cost of the

product (less distributive and tax margins) as an output to the original producer of the good. The main instance that affects most industries (besides retail sales) is alcohol sales. In this case, only the service margins are recognized as output, and the costs are assigned to the alcohol manufacturing sectors (beer, wine and liquor/distillers). In effect, then, the alcohol manufacturing sector is a direct provider to tourists under National Accounting principles.

The following simplified diagram may help explain some of these differences. On the left hand side is a financial statement containing revenues for rooms, food and beverage, rental income, merchandise sales, and interest and dividend payments. Room and Food & Beverage revenues are mapped directly into the Accommodation and Restaurant categories, but with the addition of (say, 10%) gratuities. Rental Income is part of the production process and therefore is entered on the National Accounting side. Merchandise under National Accounting is the net value. Interest and Dividends are not part of production, and they are excluded from the right hand side. Operating Expenses are mapped and broken down according to their constituent parts: the cost at the factory gate, the distributive (wholesale, retail and transportation) costs, and the various taxes and duties. Wages go directly into the Wages and Salaries component, but include the gratuities.


Financial Accounting
National Accounting
Rooms (100)
Food & Beverage (100)
Rental Income (50)
Merchandise Sales (10)
Int. & Div. (10)
Operating Expenses (100)
Merchandise Costs (6)
Wages (100)
Gratuities (20)
Accommodation (110)
Restaurant (110)
Rental Income (50)
Merchandise Sales (10-6=4)
Material Inputs (50)
Distributive Trade (25)
Commodity Taxes (5)
Import Duties (20)
Wages and Salaries (120)

APPENDIX B: FINANCIAL PROJECTION – OPTION 2

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mill Feed (millions of tonnes)	**17.3**	**18.6**	**18.6**	**19.0**	**20.4**	**19.2**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**
Concentrates (tonnes)	130,615	150,158	146,412	148,117	182,571	141,382	138,793	213,094	208,564	203,655	169,661
Headgrade	0.220	0.220	0.220	0.220	0.248	0.210	0.115	0.173	0.166	0.159	0.130
Gold (gpt)	0.724	0.702	0.735	0.71	0.732	0.660	0.388	0.389	0.351	0.329	0.262
Gold Recovery	0.701	0.699	0.691	0.66	0.69	0.69	0.69	0.69	0.69	0.69	0.61
Gold Production (oz)	**282,300**	**294,117**	**303,475**	**286,251**	**331,269**	**281,116**	**301,259**	**302,035**	**272,530**	**255,449**	**179,841**
Realized Gold Price (US$/oz)	*$327*	*$356*	*$387*	*$425*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*
Gold Market (US$/oz)	*$310*	*$364*	*$409*	*$450*							
Gross Gold Revenues	**$92.3**	**$104.7**	**$117.4**	**$121.7**	**$132.5**	**$112.4**	**$120.5**	**$120.8**	**$109.0**	**$102.2**	**$71.9**
Copper Concentrate (%)	0.236	0.225	0.231	0.23	0.23	0.231	0.232	0.233	0.234	0.235	0.236
Copper Recovery	0.810	0.824	0.827	0.815	0.83	0.81	0.8	0.82	0.84	0.86	0.88
Copper Production (000 lbs)	**72,900**	**76,177**	**78,291**	**78,354**	**96,580**	**75,443**	**74,704**	**115,687**	**114,201**	**112,469**	**94,494**
Realized Copper Price (US$/lb)	*$0.71*	*$0.81*	*$1.30*	*$1.65*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*
Gross Copper Revenues	**$51.8**	**$61.7**	**$101.8**	**$129.3**	**$135.2**	**$105.6**	**$104.6**	**$162.0**	**$159.9**	**$157.5**	**$132.3**
Gross Revenues	**$144.1**	**$166.4**	**$219.2**	**$250.9**	**$267.7**	**$218.1**	**$225.1**	**$282.8**	**$268.9**	**$259.6**	**$204.2**
Shipping Costs	$20.8	$22.4	$22.3	$23.5	$30.1	$23.3	$22.9	$35.2	$34.4	$33.6	$28.0
Processing Costs & Other	$13.2	$12.4	$9.7	$19.3	$17.3	$13.4	$13.2	$20.4	$20.0	$19.6	$16.4
Revenues	**$110.3**	**$131.4**	**$189.0**	**$208.2**	**$220.3**	**$181.3**	**$188.9**	**$227.2**	**$214.4**	**$206.4**	**$159.8**
Cost of Sales (incl. G&A)	**$83.0**	**$88.3**	**$109.8**	**$112.6**	**$116.3**	**$111.4**	**$139.4**	**$144.9**	**$143.8**	**$134.9**	**$126.5**
Materials	*$66.3*	*$69.5*	*$89.8*	*$91.6*	*$94.4*	*$90.8*	*$114.8*	*$120.7*	*$119.4*	*$112.8*	*$104.7*
Payroll	*$16.7*	*$18.7*	*$20.2*	*$21.0*	*$21.8*	*$20.6*	*$24.6*	*$24.2*	*$24.4*	*$22.1*	*$21.8*
Employment	*424*	*424*	*424*	*424*	*424*	*400*	*477*	*470*	*474*	*429*	*424*
EBITD	**$27.3**	**$43.2**	**$79.2**	**$95.6**	**$104.0**	**$69.9**	**$49.6**	**$82.3**	**$70.7**	**$71.5**	**$33.3**
Depreciation & Depletion	*$25.8*	*$34.1*	*$36.2*	*$37.4*	*$24.8*	*$24.9*	*$26.2*	*$25.9*	*$40.4*	*$61.0*	*$65.1*
Accumulated Deprec.	$0.0	$87.2	$120.5	$158.0	$182.8	$207.7	$234.0	$259.9	$300.3	$361.3	$426.4
Mining Taxes	*$1.3*	*$1.4*	*$2.3*	*$2.5*	*$2.7*	*$2.2*	*$2.3*	*$2.7*	*$2.6*	*$2.5*	*$1.9*
Interest	*$4.6*	*$3.6*	*$3.0*	*$1.5*	*$5.5*	*$9.3*	*$7.9*	*$7.4*	*$14.6*	*$21.9*	*$22.2*
Accretion of Site Closure	*$0.3*	*$0.6*	*$0.9*								
Income Taxes	***$0.0***	***-$2.6***	***$2.6***	***$5.7***	***$8.2***	***$0.6***	***-$3.5***	***$3.2***	***-$3.5***	***-$9.0***	***-$17.4***
Earnings ($US)	**-$4.7**	**$6.1**	**$34.1**	**$48.5**	**$62.9**	**$32.9**	**$16.7**	**$43.1**	**$16.6**	**-$4.9**	**-$38.5**
Earnings ($Can)	**-$7.4**	**$8.6**	**$44.4**	**$60.6**	**$75.4**	**$39.5**	**$20.1**	**$51.7**	**$19.9**	**-$5.8**	**-$46.2**
Capital Acquisitions											
Total Capital Assets	$251.4	$257.9	$275.4	$285.4	$422.4	$563.6	$575.8	$588.0	$786.7	$985.4	$997.6
of which additions to P & E	$19.9	$12.9	$17.5	$10.0	$8.0	$5.0	$6.0	$7.0	$8.0	$9.0	$10.0
Exchange Rate	1.57	1.40	1.30	1.25	1.20	1.20	1.20	1.20	1.20	1.20	1.20

	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL 2006-2021	NPV 2006-2021
Mill Feed (millions of tonnes)	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**9.1**	**503.7**	
Concentrates (tonnes)	170,865	153,132	194,199	228,778	298,148	308,100	192,939	372,434	19,012	3,195,328	
Headgrade	0.130	0.117	0.149	0.177	0.230	0.237	0.148	0.288	0.057	0.0	
Gold (gpt)	0.231	0.235	0.291	0.333	0.432	0.266	0.223	0.517	0.146	0.0	
Gold Recovery	0.61	0.61	0.61	0.61	0.68	0.61	0.61	0.68	0.61	0.0	
Gold Production (oz)	**158,563**	**161,308**	**199,748**	**228,577**	**330,561**	**182,587**	**153,071**	**395,602**	**26,056**	**3,759,572**	
Realized Gold Price (US$/oz)	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	*$400*	0.0	
Gold Market (US$/oz)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0.0	
Gross Gold Revenues	**$63.4**	**$64.5**	**$79.9**	**$91.4**	**$132.2**	**$73.0**	**$61.2**	**$158.2**	**$10.4**	**$1,503.8**	**$1,055.7**
Copper Concentrate (%)	0.237	0.238	0.239	0.241	0.243	0.245	0.247	0.249	0.251	0.0	
Copper Recovery	0.89	0.89	0.89	0.89	0.9	0.91	0.92	0.92	0.92	0.0	
Copper Production (000 lbs)	**95,973**	**86,740**	**110,928**	**132,877**	**176,054**	**184,937**	**117,710**	**230,913**	**11,978**	**1,831,688**	
Realized Copper Price (US$/lb)	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	*$1.40*	0.0	
Gross Copper Revenues	**$134.4**	**$121.4**	**$155.3**	**$186.0**	**$246.5**	**$258.9**	**$164.8**	**$323.3**	**$16.8**	**$2,564.4**	**$1,679.2**
Gross Revenues	**$197.8**	**$186.0**	**$235.2**	**$277.5**	**$378.7**	**$331.9**	**$226.0**	**$481.5**	**$27.2**	**$4,068.2**	**$2,734.9**
Shipping Costs	$28.2	$25.3	$32.1	$37.8	$49.2	$50.9	$31.9	$61.5	$3.1	$527.6	$349.3
Processing Costs & Other	$16.5	$14.9	$18.9	$22.4	$29.4	$30.6	$19.3	$37.4	$1.9	$311.7	$205.5
Revenues	**$153.0**	**$145.8**	**$184.2**	**$217.3**	**$300.1**	**$250.5**	**$174.9**	**$382.6**	**$22.1**	**$3,228.9**	**$2,180.1**
Cost of Sales (incl. G&A)	**$136.8**	**$124.7**	**$117.4**	**$120.7**	**$126.1**	**$106.1**	**$119.1**	**$102.4**	**$2.6**	**$1,872.9**	**$1,307.2**
Materials	*$114.1*	*$103.7*	*$97.2*	*$100.0*	*$104.4*	*$87.3*	*$99.8*	*$85.3*	*$0.0*	*$1,549.4*	*$1,080.9*
Payroll	*$22.8*	*$21.0*	*$20.1*	*$20.7*	*$21.6*	*$18.8*	*$19.3*	*$17.0*	*$2.6*	*$323.5*	*$226.3*
Employment	*442*	*408*	*391*	*402*	*420*	*365*	*375*	*331*	*50*	*415*	
EBITD	**$16.2**	**$21.1**	**$66.9**	**$96.6**	**$174.0**	**$144.4**	**$55.8**	**$280.3**	**$19.6**	**$1,356.0**	**$872.9**
Depreciation & Depletion	*$66.6*	*$68.4*	*$70.4*	*$72.9*	*$75.9*	*$80.0*	*$86.1*	*$98.3*	*$70.2*	*$957.2*	*$596.3*
Accumulated Deprec.	$493.0	$561.4	$631.9	$704.7	$780.6	$860.6	$946.7	$1,045.0	$1,115.2	*$0.0*	
Mining Taxes	*$1.8*	*$1.8*	*$2.2*	*$2.6*	*$3.6*	*$3.0*	*$2.1*	*$4.6*	*$0.3*	*$38.9*	*$26.3*
Interest	*$23.6*	*$25.9*	*$28.6*	*$30.6*	*$31.6*	*$31.0*	*$29.8*	*$30.6*	*$0.0*	*$320.4*	*$202.0*
Accretion of Site Closure	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$110.0*	*$0.0*	*$0.0*
Income Taxes	*-$21.5*	*-$21.3*	*-$13.1*	*-$8.1*	*$6.5*	*$0.0*	*-$18.7*	*$23.4*	*-$16.4*	*-$90.7*	*-$90.7*
Earnings ($US)	**-$54.4**	**-$53.7**	**-$21.3**	**-$1.5**	**$56.4**	**$30.4**	**-$43.5**	**$123.3**	**-$144.5**	**$20.2**	**$55.1**
Earnings ($Can)	**-$65.3**	**-$64.4**	**-$25.5**	**-$1.7**	**$67.6**	**$36.5**	**-$52.2**	**$148.0**	**-$173.4**	**$24.3**	**$66.1**
Capital Acquisitions											
Total Capital Assets	$1,009.8	$1,022.0	$1,034.2	$1,046.4	$1,058.6	$1,070.8	$1,083.0	$1,095.2	$1,115.2	**$440.2**	
of which additions to P & E	$12.0	$13.0	$14.0	$15.0	$16.0	$17.0	$18.0	$20.0	$0.0	$178.0	
Exchange Rate	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20		
Processing Charge ($US)	$62	$62	$62	$62	$62	$62	$62	$62	$62		

APPENDIX C: FINANCIAL PROJECTION – OPTION 1: Gold at $500

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mill Feed (millions of tonnes)	**17.3**	**18.6**	**18.6**	**19.0**	**20.4**	**19.2**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**
Concentrates (tonnes)	130,615	150,158	146,412	148,117	182,571	141,382	138,793	213,094	208,564	203,655	169,661
Headgrade	0.220	0.220	0.220	0.220	0.248	0.210	0.115	0.173	0.166	0.159	0.130
Gold (gpt)	0.724	0.702	0.735	0.71	0.732	0.660	0.388	0.389	0.351	0.329	0.262
Gold Recovery	0.701	0.699	0.691	0.66	0.69	0.69	0.69	0.69	0.69	0.69	0.61
Gold Production (oz)	**282,300**	**294,117**	**303,475**	**286,251**	**331,269**	**281,116**	**301,259**	**302,035**	**272,530**	**255,449**	**179,841**
Realized Gold Price (US$/oz)	*$327*	*$356*	*$387*	*$425*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*
Gold Market (US$/oz)	*$310*	*$364*	*$409*	*$450*							
Gross Gold Revenues	**$92.3**	**$104.7**	**$117.4**	**$121.7**	**$165.6**	**$140.6**	**$150.6**	**$151.0**	**$136.3**	**$127.7**	**$89.9**
Copper Concentrate (%)	0.236	0.225	0.231	0.23	0.23	0.231	0.232	0.233	0.234	0.235	0.236
Copper Recovery	0.810	0.824	0.827	0.815	0.83	0.81	0.8	0.82	0.84	0.86	0.88
Copper Production (000 lbs)	**72,900**	**76,177**	**78,291**	**78,354**	**96,580**	**75,443**	**74,704**	**115,687**	**114,201**	**112,469**	**94,494**
Realized Copper Price (US$/lb)	*$0.71*	*$0.81*	*$1.30*	*$1.65*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*
Gross Copper Revenues	**$51.8**	**$61.7**	**$101.8**	**$129.3**	**$173.8**	**$135.8**	**$134.5**	**$208.2**	**$205.6**	**$202.4**	**$170.1**
Gross Revenues	**$144.1**	**$166.4**	**$219.2**	**$250.9**	**$339.5**	**$276.4**	**$285.1**	**$359.3**	**$341.8**	**$330.2**	**$260.0**
Shipping Costs	$20.8	$22.4	$22.3	$23.5	$30.1	$23.3	$22.9	$35.2	$34.4	$33.6	$28.0
Processing Costs & Other	$13.2	$12.4	$9.7	$19.3	$17.3	$13.4	$13.2	$20.4	$20.0	$19.6	$16.4
Revenues	**$110.3**	**$131.4**	**$189.0**	**$208.2**	**$292.0**	**$239.6**	**$248.9**	**$303.7**	**$287.4**	**$276.9**	**$215.6**
Cost of Sales (incl. G&A)	**$83.0**	**$88.3**	**$109.8**	**$112.6**	**$116.3**	**$111.4**	**$139.4**	**$144.9**	**$143.8**	**$134.9**	**$126.5**
Materials	*$66.3*	*$69.5*	*$89.8*	*$91.6*	*$94.4*	*$90.8*	*$114.8*	*$120.7*	*$119.4*	*$112.8*	*$104.7*
Payroll	*$16.7*	*$18.7*	*$20.2*	*$21.0*	*$21.8*	*$20.6*	*$24.6*	*$24.2*	*$24.4*	*$22.1*	*$21.8*
Employment	*424*	*424*	*424*	*424*	*424*	*400*	*477*	*470*	*474*	*429*	*424*
EBITD	**$27.3**	**$43.2**	**$79.2**	**$95.6**	**$175.8**	**$128.2**	**$109.6**	**$158.8**	**$143.6**	**$142.1**	**$89.1**
Depreciation & Depletion	*$25.8*	*$34.1*	*$36.2*	*$37.4*	*$24.8*	*$24.2*	*$22.5*	*$20.9*	*$21.1*	*$23.1*	*$19.7*
Accumulated Deprec.	$0.0	$87.2	$120.5	$158.0	$182.8	$207.0	$229.6	$250.4	$271.6	$294.6	$314.3
Mining Taxes	*$1.3*	*$1.4*	*$2.3*	*$2.5*	*$3.5*	*$2.9*	*$3.0*	*$3.7*	*$3.5*	*$3.3*	*$2.6*
Interest	*$4.6*	*$3.6*	*$3.0*	*$1.5*	*$3.8*	*$8.1*	*$6.4*	*$5.1*	*$2.7*	*$0.6*	*$0.5*
Accretion of Site Closure	*$0.3*	*$0.6*	*$0.9*								
Income Taxes	***$0.0***	***-$2.6***	***$2.6***	***$5.7***	***$23.7***	***$13.5***	***$10.4***	***$20.8***	***$18.2***	***$18.0***	***$8.1***
Earnings ($US)	**-$4.7**	**$6.1**	**$34.1**	**$48.5**	**$119.9**	**$79.5**	**$67.2**	**$108.4**	**$98.1**	**$97.1**	**$58.2**
Earnings ($Can)	**-$7.4**	**$8.6**	**$44.4**	**$60.6**	**$143.8**	**$95.4**	**$80.7**	**$130.1**	**$117.7**	**$116.6**	**$69.8**
Capital Acquisitions											
Total Capital Assets	$251.4	$257.9	$275.4	$285.4	$383.4	$483.4	$491.1	$498.9	$506.6	$514.4	$522.1
of which additions to P & E	$19.9	$12.9	$17.5	$10.0	$8.0	$7.8	$7.8	$7.8	$7.8	$7.8	$7.8
Exchange Rate	1.57	1.40	1.30	1.25	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Processing Charge ($US)	$65	$55	$43	$85	$62	$62	$62	$62	$62	$62	$62

	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL 2006-2021	NPV 2006-2021
Mill Feed (millions of tonnes)	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**9.1**	**503.7**	
Concentrates (tonnes)	170,865	153,132	194,199	228,778	298,148	308,100	192,939	372,434	19,012	3,195,328	
Headgrade	0.130	0.117	0.149	0.177	0.230	0.237	0.148	0.288	0.057	0.0	
Gold (gpt)	0.231	0.235	0.291	0.333	0.432	0.266	0.223	0.517	0.146	0.0	
Gold Recovery	0.61	0.61	0.61	0.61	0.68	0.61	0.61	0.68	0.61	0.0	
Gold Production (oz)	**158,563**	**161,308**	**199,748**	**228,577**	**330,561**	**182,587**	**153,071**	**395,602**	**26,056**	**3,759,572**	
Realized Gold Price (US$/oz)	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	0.0	
Gold Market (US$/oz)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0.0	
Gross Gold Revenues	**$79.3**	**$80.7**	**$99.9**	**$114.3**	**$165.3**	**$91.3**	**$76.5**	**$197.8**	**$13.0**	**$1,879.8**	**$1,319.6**
Copper Concentrate (%)	0.237	0.238	0.239	0.241	0.243	0.245	0.247	0.249	0.251	0.0	
Copper Recovery	0.89	0.89	0.89	0.89	0.9	0.91	0.92	0.92	0.92	0.0	
Copper Production (000 lbs)	**95,973**	**86,740**	**110,928**	**132,877**	**176,054**	**184,937**	**117,710**	**230,913**	**11,978**	**1,831,688**	
Realized Copper Price (US$/lb)	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	0.0	
Gross Copper Revenues	**$172.8**	**$156.1**	**$199.7**	**$239.2**	**$316.9**	**$332.9**	**$211.9**	**$415.6**	**$21.6**	**$3,297.0**	**$2,159.0**
Gross Revenues	**$252.0**	**$236.8**	**$299.5**	**$353.5**	**$482.2**	**$424.2**	**$288.4**	**$613.4**	**$34.6**	**$5,176.8**	**$3,478.6**
Shipping Costs	$28.2	$25.3	$32.1	$37.8	$49.2	$50.9	$31.9	$61.5	$3.1	$527.6	$349.3
Processing Costs & Other	$16.5	$14.9	$18.9	$22.4	$29.4	$30.6	$19.3	$37.4	$1.9	$311.7	$205.5
Revenues	**$207.3**	**$196.6**	**$248.6**	**$293.3**	**$403.5**	**$342.7**	**$237.3**	**$514.5**	**$29.5**	**$4,337.5**	**$2,923.8**
Cost of Sales (incl. G&A)	**$136.8**	**$124.7**	**$117.4**	**$120.7**	**$126.1**	**$106.1**	**$119.1**	**$102.4**	**$2.6**	**$1,872.9**	**$1,307.2**
Materials	*$114.1*	*$103.7*	*$97.2*	*$100.0*	*$104.4*	*$87.3*	*$99.8*	*$85.3*	*$0.0*	*$1,549.4*	*$1,080.9*
Payroll	*$22.8*	*$21.0*	*$20.1*	*$20.7*	*$21.6*	*$18.8*	*$19.3*	*$17.0*	*$2.6*	*$323.5*	*$226.3*
Employment	*442*	*408*	*391*	*402*	*420*	*365*	*375*	*331*	*50*	*415*	
EBITD	**$70.4**	**$71.9**	**$131.2**	**$172.6**	**$277.5**	**$236.6**	**$118.2**	**$412.2**	**$27.0**	**$2,464.6**	**$1,616.6**
Depreciation & Depletion	*$20.7*	*$21.8*	*$23.1*	*$24.6*	*$26.6*	*$29.1*	*$33.0*	*$40.8*	*$58.0*	*$433.9*	*$279.7*
Accumulated Deprec.	$335.0	$356.8	$379.8	$404.5	$431.0	$460.1	$493.2	$533.9	$591.9	*$0.0*	
Mining Taxes	*$2.5*	*$2.4*	*$3.0*	*$3.5*	*$4.9*	*$4.1*	*$2.9*	*$6.2*	*$0.4*	*$52.3*	*$35.2*
Interest	*$1.0*	*$3.0*	*$4.7*	*$5.4*	*$4.2*	*$0.7*	*-$2.1*	*-$1.5*	*$0.0*	*$42.5*	*$33.1*
Accretion of Site Closure	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$36.5*	*$0.0*	*$0.0*
Income Taxes	*$4.1*	*$3.8*	*$15.0*	*$22.8*	*$43.5*	*$35.6*	*$11.8*	*$68.7*	*-$11.6*	*$306.6*	*$199.0*
Earnings ($US)	**$42.2**	**$41.0**	**$85.4**	**$116.2**	**$198.3**	**$167.0**	**$72.7**	**$298.0**	**-$56.3**	**$1,592.9**	**$1,052.8**
Earnings ($Can)	**$50.6**	**$49.2**	**$102.5**	**$139.5**	**$237.9**	**$200.4**	**$87.2**	**$357.6**	**-$67.5**	**$1,911.5**	**$1,263.4**
Capital Acquisitions											
Total Capital Assets	$529.9	$537.6	$545.4	$553.1	$560.9	$568.6	$576.4	$584.1	$591.9	**$298.5**	
of which additions to P & E	$7.8	$7.8	$7.8	$7.8	$7.8	$7.8	$7.8	$7.8	$0.0	$108.5	
Exchange Rate	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20		
Processing Charge ($US)	$62	$62	$62	$62	$62	$62	$62	$62	$62		

APPENDIX D: FINANCIAL PROJECTION – OPTION 2: Gold at $500

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mill Feed (millions of tonnes)	**17.3**	**18.6**	**18.6**	**19.0**	**20.4**	**19.2**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**
Concentrates (tonnes)	130,615	150,158	146,412	148,117	182,571	141,382	138,793	213,094	208,564	203,655	169,661
Headgrade	0.220	0.220	0.220	0.220	0.248	0.210	0.115	0.173	0.166	0.159	0.130
Gold (gpt)	0.724	0.702	0.735	0.71	0.732	0.660	0.388	0.389	0.351	0.329	0.262
Gold Recovery	0.701	0.699	0.691	0.66	0.69	0.69	0.69	0.69	0.69	0.69	0.61
Gold Production (oz)	**282,300**	**294,117**	**303,475**	**286,251**	**331,269**	**281,116**	**301,259**	**302,035**	**272,530**	**255,449**	**179,841**
Realized Gold Price (US$/oz)	*$327*	*$356*	*$387*	*$425*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*
Gold Market (US$/oz)	*$310*	*$364*	*$409*	*$450*							
Gross Gold Revenues	**$92.3**	**$104.7**	**$117.4**	**$121.7**	**$165.6**	**$140.6**	**$150.6**	**$151.0**	**$136.3**	**$127.7**	**$89.9**
Copper Concentrate (%)	0.236	0.225	0.231	0.23	0.23	0.231	0.232	0.233	0.234	0.235	0.236
Copper Recovery	0.810	0.824	0.827	0.815	0.83	0.81	0.8	0.82	0.84	0.86	0.88
Copper Production (000 lbs)	**72,900**	**76,177**	**78,291**	**78,354**	**96,580**	**75,443**	**74,704**	**115,687**	**114,201**	**112,469**	**94,494**
Realized Copper Price (US$/lb)	*$0.71*	*$0.81*	*$1.30*	*$1.65*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*
Gross Copper Revenues	**$51.8**	**$61.7**	**$101.8**	**$129.3**	**$173.8**	**$135.8**	**$134.5**	**$208.2**	**$205.6**	**$202.4**	**$170.1**
Gross Revenues	**$144.1**	**$166.4**	**$219.2**	**$250.9**	**$339.5**	**$276.4**	**$285.1**	**$359.3**	**$341.8**	**$330.2**	**$260.0**
Shipping Costs	$20.8	$22.4	$22.3	$23.5	$30.1	$23.3	$22.9	$35.2	$34.4	$33.6	$28.0
Processing Costs & Other	$13.2	$12.4	$9.7	$19.3	$17.3	$13.4	$13.2	$20.4	$20.0	$19.6	$16.4
Revenues	**$110.3**	**$131.4**	**$189.0**	**$208.2**	**$292.0**	**$239.6**	**$248.9**	**$303.7**	**$287.4**	**$276.9**	**$215.6**
Cost of Sales (incl. G&A)	**$83.0**	**$88.3**	**$109.8**	**$112.6**	**$116.3**	**$111.4**	**$139.4**	**$144.9**	**$143.8**	**$134.9**	**$126.5**
Materials	*$66.3*	*$69.5*	*$89.8*	*$91.6*	*$94.4*	*$90.8*	*$114.8*	*$120.7*	*$119.4*	*$112.8*	*$104.7*
Payroll	*$16.7*	*$18.7*	*$20.2*	*$21.0*	*$21.8*	*$20.6*	*$24.6*	*$24.2*	*$24.4*	*$22.1*	*$21.8*
Employment	*424*	*424*	*424*	*424*	*424*	*400*	*477*	*470*	*474*	*429*	*424*
EBITD	**$27.3**	**$43.2**	**$79.2**	**$95.6**	**$175.8**	**$128.2**	**$109.6**	**$158.8**	**$143.6**	**$142.1**	**$89.1**
Depreciation & Depletion	*$25.8*	*$34.1*	*$36.2*	*$37.4*	*$24.8*	*$24.9*	*$25.6*	*$24.9*	*$38.9*	*$59.0*	*$62.6*
Accumulated Deprec.	$0.0	$87.2	$120.5	$158.0	$182.8	$207.7	$233.3	$258.2	$297.1	$356.1	$418.7
Mining Taxes	*$1.3*	*$1.4*	*$2.3*	*$2.5*	*$3.5*	*$2.9*	*$3.0*	*$3.7*	*$3.5*	*$3.3*	*$2.6*
Interest	*$4.6*	*$3.6*	*$3.0*	*$1.5*	*$5.5*	*$7.0*	*$2.2*	*-$1.2*	*$2.5*	*$5.9*	*$2.6*
Accretion of Site Closure	*$0.3*	*$0.6*	*$0.9*								
Income Taxes	***$0.0***	***-$2.6***	***$2.6***	***$5.7***	***$22.5***	***$12.7***	***$9.7***	***$20.4***	***$13.7***	***$8.7***	***-$1.9***
Earnings ($US)	**-$4.7**	**$6.1**	**$34.1**	**$48.5**	**$119.5**	**$80.8**	**$69.0**	**$111.2**	**$84.9**	**$65.1**	**$23.2**
Earnings ($Can)	**-$7.4**	**$8.6**	**$44.4**	**$60.6**	**$143.3**	**$96.9**	**$82.8**	**$133.4**	**$101.9**	**$78.1**	**$27.8**
Capital Acquisitions											
Total Capital Assets	$251.4	$257.9	$275.4	$285.4	$422.4	$556.4	$562.4	$569.4	$763.9	$959.4	$969.4
of which additions to P & E	$19.9	$12.9	$17.5	$10.0	$8.0	$5.0	$6.0	$7.0	$8.0	$9.0	$10.0
Exchange Rate	1.57	1.40	1.30	1.25	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Processing Charge ($US)	$65	$55	$43	$85	$62	$62	$62	$62	$62	$62	$62

	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL 2006-2021	NPV 2006-2021
Mill Feed (millions of tonnes)	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**35.0**	**9.1**	**503.7**	
Concentrates (tonnes)	170,865	153,132	194,199	228,778	298,148	308,100	192,939	372,434	19,012	3,195,328	
Headgrade	0.130	0.117	0.149	0.177	0.230	0.237	0.148	0.288	0.057	0.0	
Gold (gpt)	0.231	0.235	0.291	0.333	0.432	0.266	0.223	0.517	0.146	0.0	
Gold Recovery	0.61	0.61	0.61	0.61	0.68	0.61	0.61	0.68	0.61	0.0	
Gold Production (oz)	**158,563**	**161,308**	**199,748**	**228,577**	**330,561**	**182,587**	**153,071**	**395,602**	**26,056**	**3,759,572**	
Realized Gold Price (US$/oz)	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	*$500*	0.0	
Gold Market (US$/oz)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0.0	
Gross Gold Revenues	**$79.3**	**$80.7**	**$99.9**	**$114.3**	**$165.3**	**$91.3**	**$76.5**	**$197.8**	**$13.0**	**$1,879.8**	**$1,319.6**
Copper Concentrate (%)	0.237	0.238	0.239	0.241	0.243	0.245	0.247	0.249	0.251	0.0	
Copper Recovery	0.89	0.89	0.89	0.89	0.9	0.91	0.92	0.92	0.92	0.0	
Copper Production (000 lbs)	**95,973**	**86,740**	**110,928**	**132,877**	**176,054**	**184,937**	**117,710**	**230,913**	**11,978**	**1,831,688**	
Realized Copper Price (US$/lb)	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	*$1.80*	0.0	
Gross Copper Revenues	**$172.8**	**$156.1**	**$199.7**	**$239.2**	**$316.9**	**$332.9**	**$211.9**	**$415.6**	**$21.6**	**$3,297.0**	**$2,159.0**
Gross Revenues	**$252.0**	**$236.8**	**$299.5**	**$353.5**	**$482.2**	**$424.2**	**$288.4**	**$613.4**	**$34.6**	**$5,176.8**	**$3,478.6**
Shipping Costs	$28.2	$25.3	$32.1	$37.8	$49.2	$50.9	$31.9	$61.5	$3.1	$527.6	$349.3
Processing Costs & Other	$16.5	$14.9	$18.9	$22.4	$29.4	$30.6	$19.3	$37.4	$1.9	$311.7	$205.5
Revenues	**$207.3**	**$196.6**	**$248.6**	**$293.3**	**$403.5**	**$342.7**	**$237.3**	**$514.5**	**$29.5**	**$4,337.5**	**$2,923.8**
Cost of Sales (incl. G&A)	**$136.8**	**$124.7**	**$117.4**	**$120.7**	**$126.1**	**$106.1**	**$119.1**	**$102.4**	**$2.6**	**$1,872.9**	**$1,307.2**
Materials	*$114.1*	*$103.7*	*$97.2*	*$100.0*	*$104.4*	*$87.3*	*$99.8*	*$85.3*	*$0.0*	*$1,549.4*	*$1,080.9*
Payroll	*$22.8*	*$21.0*	*$20.1*	*$20.7*	*$21.6*	*$18.8*	*$19.3*	*$17.0*	*$2.6*	*$323.5*	*$226.3*
Employment	*442*	*408*	*391*	*402*	*420*	*365*	*375*	*331*	*50*	*415*	
EBITD	**$70.4**	**$71.9**	**$131.2**	**$172.6**	**$277.5**	**$236.6**	**$118.2**	**$412.2**	**$27.0**	**$2,464.6**	**$1,616.6**
Depreciation & Depletion	*$64.1*	*$65.9*	*$68.3*	*$71.3*	*$75.3*	*$80.9*	*$89.9*	*$109.9*	*$70.2*	*$956.4*	*$592.5*
Accumulated Deprec.	$482.7	$548.6	$616.9	$688.2	$763.4	$844.3	$934.3	$1,044.2	$1,114.4	*$0.0*	
Mining Taxes	*$2.5*	*$2.4*	*$3.0*	*$3.5*	*$4.9*	*$4.1*	*$2.9*	*$6.2*	*$0.4*	*$52.3*	*$35.2*
Interest	*$0.9*	*$0.7*	*$0.9*	*$0.3*	*$0.9*	*$1.7*	*$2.4*	*$3.3*	*$0.0*	*$35.6*	*$26.7*
Accretion of Site Closure	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$0.0*	*$110.0*	*$0.0*	*$0.0*
Income Taxes	*-$5.6*	*-$5.6*	*$5.8*	*$13.5*	*$33.4*	*$24.1*	*-$1.5*	*$52.9*	*-$15.0*	*$187.8*	*$127.2*
Earnings ($US)	**$8.5**	**$8.5**	**$53.4**	**$84.0**	**$163.0**	**$125.8**	**$24.5**	**$239.9**	**-$138.6**	**$1,122.6**	**$784.6**
Earnings ($Can)	**$10.2**	**$10.2**	**$64.0**	**$100.8**	**$195.6**	**$151.0**	**$29.4**	**$287.9**	**-$166.4**	**$1,347.1**	**$941.5**
Capital Acquisitions											
Total Capital Assets	$981.4	$994.4	$1,008.4	$1,023.4	$1,039.4	$1,056.4	$1,074.4	$1,094.4	$1,114.4	**$801.0**	
of which additions to P & E	$12.0	$13.0	$14.0	$15.0	$16.0	$17.0	$18.0	$20.0	$0.0	$178.0	
Exchange Rate	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20		
Processing Charge ($US)	$62	$62	$62	$62	$62	$62	$62	$62	$62		