



***MACKENZIE VALLEY
ENVIRONMENTAL IMPACT
REVIEW BOARD***

September, 2000

**BHP EA Peer Review:
Economic Analysis**

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*Mackenzie Valley Environmental Impact Review Board
BHP EA Peer Review - Economic Analysis*

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

As part of the approval process under the Mackenzie Valley Resource Management Act, BHP Diamonds Inc. has prepared an Environmental Assessment Report (EAR) on the proposed development of the Sable, Pigeon, and Beartooth kinberlite pipes at the existing EKATI™ mine. The three new pipes are proposed as partial replacement for the Leslie Pipe, which was found to be uneconomic and was therefore eliminated from the original mine plan.

The Terms of Reference developed for the EAR required BHP to provide a number of economic analyses related to the proposed development of the three new pipes. The purpose of this report is to assess whether the economic issues identified in the Terms of Reference have been addressed in a sufficient and appropriate way in the EAR, and whether the results of the analyses appear to be reasonable.

1.2 SCOPE OF WORK

The sections in the Terms of Reference which were identified as being of greatest relevance to a review of the economic issues were Sections 3.1.6, 3.3.3, 3.3.5, and 3.5. Brief descriptions of the requirements under each of these sections are as follows:

- Section 3.1.6 requires BHP to address costs and benefits of development alternatives;
- Section 3.3.3 entails discussion of a number of economic impacts from the project;
- Section 3.3.5 requires assessment of the net fiscal impacts from the project on the federal and territorial governments; and,
- Section 3.5 concerns cumulative effects.

Although the entire EAR was reviewed in order to identify other areas of relevance, this report focuses on the portions of the EAR that address the Terms of Reference described above, including all Information Requests related to them.

This review was conducted over a period of less than two weeks. This time frame has not permitted an independent corroboration of the primary data and information presented in the EAR. Although primary data presented in the EAR have been reviewed for consistency, it has been generally assumed that the findings and data upon which the economic analyses are based are accurate. The focus of the review is, therefore, not on the accuracy of the input data, but on the completeness and appropriateness of the analyses that follow from the data.

1.3 STRUCTURE OF REPORT

The remainder of this report is structured as follows:

- Section 2 describes the basis used for assessing the EAR's economic analyses;
- Section 3 assesses the economic analysis regarding development alternatives;
- Section 4 evaluates the analysis of economic impacts provided in response to Section 3.3.3 of the Terms of Reference;¹
- Section 5 assesses the analysis of cumulative socio-economic impacts; and,
- Section 6 provides an overall assessment.

¹ The issue of fiscal revenues is covered both in Sections 3.3.3 and in Section 3.3.5 of the Terms of Reference. It is addressed in Section 4 of this report.

2.0 BASIS FOR ASSESSING BHP's ECONOMIC ANALYSES

2.1 STANDARDS FOR ASSESSMENT

Like any other type of analysis, economic analyses are never as exhaustive as they could be. However, time and resources are finite and there are limits to the amount of analysis that is possible, reasonable, and useful. Assessment of the economic analysis contained in the EAR has therefore not been based on whether or not it could be expanded or improved, since that is always possible. Rather, the assessment has been based on two questions:

- Does the analysis address the concerns and requirements of the Board? and,
- Does it meet the standards and practices of other regulatory agencies?

Board concerns and requirements were identified on the basis of:

- Direction contained in the Terms of Reference for the project;
- Additional direction contained in Part 5 of the Mackenzie Valley Resource Management Act and in the MVEIRB's Interim Guidelines;² and,
- Indications regarding potential Board concerns as reflected in the MVEIRB's review of the Diavik project.³

Standards and practices of other regulatory agencies were based on:

- Knowledge of information requirements under the Canadian Environmental Assessment Act (CEAA), the Alberta Energy and Utilities Board (AEUB), the Alberta Natural Resources Conservation Board (NRCB), and the National Energy Board (NEB);
- Experience as expert witness and regulatory advisor at several public hearings before various regulatory boards;⁴ and,
- Participation in preparing Decision Reports.

2.2 NATURE OF THE PROJECT

² Mackenzie Valley Environmental Impact Review Board, **Environmental Impact Assessment in the Mackenzie Valley: Interim Guidelines**, January 1999, Version 1

³ Mackenzie Valley Environmental Impact Review Board, **Views on the Diavik Diamonds Project comprehensive Study Report**, October 7, 1999

⁴ Including hearings on the proposed Cheviot coal mine before a joint CEAA and AEUB panel; the Imperial Oil Cold Lake Expansion Project hearing (Cold Lake, Alberta; AEUB); and the Three Sisters and Kan-Alta applications (in Canmore and Kananaskis, Alberta, respectively; both before the NRCB)

EA's should be designed "...according to the size and scale of the development, any public concern expressed, and the potential significant adverse impacts."⁵ The project under review in BHP's EAR is the development and mining of the Sable, Pigeon, and Beartooth pipes along with associated activities and infrastructure. The latter include the management of mined rock and water, and the construction and operation of haul roads. The Board has also requested information on aspects of the proposed development that will integrate with the existing mine.⁶

The existing mine, which received approval in November, 1996, has a current life of 15 years, reduced from the original expected life of 25 years by the elimination of the Leslie Pipe. The Sable, Pigeon, and Beartooth pipes will extend the mine's current life to 18 years. From an economic perspective, the project's impacts are those associated with activities and investment necessary to develop the three new pipes, and extension of the operating impacts associated with production of 18,000 t/d for a further three years. It is within this context that the economic analyses contained in BHP's EAR are assessed.

2.3 ASPECTS OF ANALYSES ASSESSED

For each of the Terms of Reference listed above, this review assesses two factors:

- The appropriateness of the general approach used to address the issue in question; and,
- The reasonableness of the results and conclusions.

⁵ MVEIRB Interim Guidelines, op cit, page 32.

⁶ MVEIRB, **Environmental Assessment Terms of Reference of the BHP Diamonds Inc. Beartooth, Pigeon and Sable Kimberlite Pit Mine Extension**, Dec. 13, 1999

3.0 DEVELOPMENT ALTERNATIVES

3.1 TERMS OF REFERENCE REQUIREMENTS

Section 3.1.6 of the Terms of Reference⁷ require the proponent to report the comparative costs of proposed development alternatives and the corresponding environmental benefits. These issues are addressed in Section 2.3 of the EAR and in several information request responses.

3.2 APPROPRIATENESS OF ANALYTICAL APPROACH

Because environmental impacts are not the subject of this review, the following discussion focuses on the analysis in the EAR of comparative costs.

The EAR discusses alternatives for disposal of processed kimberlite; the Sable access road; mining methods; and backfilling of pits. In response to Information Requests, the proponent enlarged on the alternatives for the access road⁸ and mining method⁹ and addressed a question regarding alternatives for electrical power generation.¹⁰ In each case, the proponent describes the alternatives considered, the factors that would affect the development and/or operating costs associated with each relative to the chosen alternative, and the comparative environmental effects.

The analysis in each case is fairly brief; however, the reader is referred to a comprehensive discussion of development alternatives in the 1995 EIS.

The economics of each alternative are described using indicative measures or qualitative descriptions, rather than through a detailed economic analysis. For example, in the case of mining methods, the proponent describes better utilization of equipment, personnel, and infrastructure, and higher production rates for open pit as opposed to underground mining. Values per tonne of underground resources are provided for existing and proposed pits and for typical NWT gold mines, but are not compared to cost per tonne. In the case of the Sable access road, the analysis describes the infrastructure requirements that would be associated with a winter, as opposed to an all-weather, road and estimates that these would add \$129 million to the capital cost for the Sable site development.¹¹ It is also suggested that delays due to weather could increase costs. Discussions of other alternatives are similar in approach.

Thus, the discussion of development alternatives generally does not include a reporting of comparative costs and does not constitute an assessment of economic feasibility that can be corroborated, in quantitative terms, by the Board. However, the ability of the proponent to provide the necessary data is limited by the fact that this sort of information is often considered proprietary. This is common in a highly competitive industry, where operating details, and

⁷ Lines 288-289.

⁸ BHP Diamonds Inc., **Information Requests and Responses**, August 2000, p. 22.

⁹ *Ibid.*, p. 15.

¹⁰ BHP Diamonds Inc., **Information Requests and Responses**, July 2000 (pages not numbered).

¹¹ BHP Diamonds Inc., **Information Requests and Responses**, August 2000, p. 24.

particularly costs, are valuable negotiating tools for buyers and suppliers and, even more important, provide valuable information to competitors who may then use it to undercut prices.

The proponent could have provided operating cost data for alternatives but without comparable data for the chosen alternative, and without matching revenue data, the analysis would still be indicative, rather than conclusive, of economic feasibility.

For these reasons, it is our professional opinion that the approach used by the proponent in assessing the comparative costs of alternative developments is appropriate.

3.3 REASONABLENESS OF RESULTS AND CONCLUSIONS

Without a full economic feasibility assessment, it is not possible to quantitatively verify conclusions regarding the comparative economics of the alternatives. However, the arguments presented by the proponent are logical and support the conclusion that the chosen alternative in each case is the most economical from the company's perspective. Thus, the results and conclusions with respect to alternative development options appear reasonable.

4.0 IMPACTS ON THE ECONOMY

4.1 TERMS OF REFERENCE REQUIREMENTS

Section 3.3.3 of the Terms of Reference requires the proponent to describe a variety of expected economic impacts from the project. For the purposes of this review, these have been grouped into the following components:

- Direct, indirect, and induced impacts on income and employment; and impacts on activities such as tourism, outfitting, recreation, hunting, trapping and subsistence activities
- Impacts on local, territorial, and federal revenues and costs;
- Opportunities for local, regional, and territorial businesses to supply goods and services and economic diversification.
- Employment of local, aboriginal and total workers by skill category; barriers to employment; and availability of skilled workers in the NWT.
- Inflationary impacts.

A final requirement of Section 3.3.3 of the Terms of Reference is that the proponent report any changes from the 1995 EIS. Because this is a general requirement, it is addressed wherever relevant in the subsections below.

4.2 APPROPRIATENESS OF ANALYTICAL APPROACH - GENERAL

Aspects of the analytical approach used in most or all subsections of Section 4.7 are described below. Aspects particular to specific subsections are described separately.

4.2.1 Characterization of Impacts

For the purposes of discussing the economic effects of the project, the proponent takes the position that, because "the addition of the Sable, Pigeon and Beartooth pipes to the EKATI™ mine plan will not change the pace or scale of the current or planned operations at the mine,"¹² "the currently proposed development is expected to maintain the... socio-economic effects of the 18,000 t/d operation."¹³ This is a reasonable approach for characterizing economic impacts attributable to the project.

4.2.2 Geographic Extent

¹² EAR, p. 4-169

¹³ Ibid.

Section 4.7.2.1 of the EAR lists communities where economic impacts are expected to be felt. However, the analyses which follow focus on the NWT as a whole. Except for data on direct purchases by community,¹⁴ impacts by community are not reported. This is reasonable in the analysis of direct, indirect, and induced effects given that input-output models are not available for local areas and adaptations of results using regional models are likely to be quite inaccurate, particularly for small centres.

An analysis of the impacts on communities from direct hiring and purchasing would have helped the Board to understand the distribution of economic benefits within the NWT that is associated with the existing mine and which, therefore, can be expected to persist with the three new pipes. However, data on direct employment by residence could not be provided because it would violate the IBA's and employee confidentiality.¹⁵ In addition, although such an analysis might be useful in developing community-specific mitigation or enhancement measures, it would be unlikely to affect the Board's decision regarding the benefits of the project as a whole.

4.2.3 Ranking of Impacts

There is very little direction available to economists on the appropriate classification of effects as "minor", "moderate", or "major". As a result, the classification systems tend to be subjective and, for that reason, usually arguable. The proponent's approach for classifying the significance of impacts is defensible.

4.3 DIRECT, INDIRECT, AND INDUCED IMPACTS ON INCOME AND EMPLOYMENT

4.3.1 Terms of Reference Requirements

Section 3.3.3 of the Terms of Reference¹⁶ require the proponent to report the impact of the proposed development:

- on the economy, having regard to direct, indirect and induced impacts on income and employment;
- on activities such as tourism, outfitting, hunting, trapping, and the subsistence economy.

These portions of the Terms of Reference are addressed in Sections 4.7.1 through 4.7.4.3 and in Section 4.7.9. They are also addressed in the responses to several Information Requests.¹⁷

The reason for including the latter three effects with the discussion of direct, indirect, and induced impacts is that, in estimating economic impacts of a project, account should be taken of the opportunities lost as a result of the project.

¹⁴ EAR, Appendix B.

¹⁵ BHP Diamonds Inc., **Information Requests and Responses**, August 2000, p. 75.

¹⁶ Lines 482-483, 489, 497, and 498.

¹⁷ Including four from July, 2000 (pages not numbered) and four from August, 2000, pp. 76-77, 81-84, 85-87, and 88-94.

4.3.2 Appropriateness of Analytical Approach

Operating Impacts

Annual operating impacts reported in the EAR reflect those that the mine will be generating in a typical year at output of 18,000t/d and which the Sable, Pigeon, and Beartooth pipes will sustain for an additional three years. As noted above, this reflects the nature of the project and is a reasonable approach.

Impacts from Capital Expenditures

The direct, indirect, and induced effects from capital activities necessary to develop the three new pipes are not reported. Capital expenditures are likely to be minor and may, in fact, be reflected to a large extent in normal year to year expenses. If not, their exclusion means that employment and income generated by the project has been slightly understated.

Analytical Technique

Calculation of economic impacts from operation has been done using an input-output model developed for the NWT by Ellis consulting Services. The model is similar to that used by the Input-Output Division of Statistics Canada. Although there are other techniques, an input-output approach is the approach most commonly used by analysts to estimate economic impacts and the Statistics Canada model has been adapted for use in many regions of Canada.

As the consultant notes, an input-output approach has limitations.¹⁸ One of the limitations not explicitly noted in the EAR is that the model assumes that all income created is incremental. In the case of this project, some of the northern workers recruited by BHP may have been receiving social assistance prior to their hiring which will be reduced or eliminated. If so, not all of the income earned by these workers is incremental and may lead to a slight overstatement of income impacts. However, the question of incrementality is one that afflicts all input-output analyses and it can seldom be addressed quantitatively. Given this and other limitations of the technique, the economic impacts reported in the EAR should be interpreted as orders-of-magnitude. The proponent alludes to this in an Information Request Response.¹⁹

4.3.3 Reasonableness of Results and Conclusions

Employment

Direct employment from the three new pipes, assuming output of 18,000 t/d, is estimated at 633 person-years per year as per Table 4.7-2. This is about 3% lower than the 1995 estimate, due to

¹⁸ BHP Diamonds Inc., *Information Requests and Responses*, August 2000, p. 92.

¹⁹ Ibid.

more current information.²⁰ The distribution of employment between aboriginal and non-aboriginal residents is consistent with 1999 experience.

Total employment in the NWT, including direct, indirect and induced, is estimated at 1369 annual person-years, suggesting a ratio ("jobs-to-jobs") multiplier of 2.16. This is slightly lower than the comparable multiplier (of 2.24) for the mining industry in Alberta.²¹ It is not clear whether the expenditure data used by the model to generate total impacts differentiated between purchases from wholesalers or distributors versus purchases from producers. This is relevant because wholesaling activities tend to generate less employment, on a jobs to jobs basis, than manufacturing. If the model has not reflected this, and if a substantial proportion of the purchases are wholesale, estimates of total employment may be slightly higher than they would otherwise have been.

Differences between total employment estimates presented in the 1995 EIS and in the EAR are negligible. Differences which have been questioned in some of the Information Requests are due to definitional differences.²²

Labour Income

The direct income expected in the NWT from the three new pipes is reported in Table 4.7-3 as about \$44 million per year. This implies an average wage per direct worker of just over \$69,000. Given that labour income usually includes benefits in input-output analysis, and given generally high wages in the mining industry, this is reasonable.

Total labour income generated in the NWT by the project is estimated at \$82 million per year suggesting a ratio multiplier for labour income ("wages-to-wages") of 1.87. The comparable multiplier for the Alberta mining industry is 1.6. A higher multiplier in the NWT may be explainable by the use of project-specific data as opposed to industry data. It may also be due to a higher average income in the NWT economy as a whole, relative to mining, than is the case in Alberta. A further factor may be due to lack of differentiation between purchases from distributors versus producers, as noted above, although further information would be required to assess this.

As noted earlier, because some of this income may be replacing income from social assistance, not all of the \$82 million generated annually by the project may be incremental. However, as was also noted earlier, this is a limitation common to all input-output analyses.

GDP

Direct, indirect, and induced GDP are reported in Table 4.7-1. Total GDP generated in the NWT from the project is estimated at \$324 million per year. This is 1.2 times the direct GDP. The comparable multiplier for the mining industry in Alberta is 1.6. Thus, the multiplier assumed for

²⁰ BHP Diamonds Inc., **Information Requests and Responses**, July 2000 (pages not numbered).

²¹ Alberta Treasury, **Alberta Economic Multipliers 1996, 2000**

²² For example, some estimates include contractors while others are employees only; some include direct employment while others include direct, indirect, and induced.

this project is substantially lower. This may be due to the fact that diamond mining is generally a highly profitable industry and that comparable levels of profit (a component of GDP) will not be replicated in the economy as a whole.

A comparison of labour income against GDP shows that total (direct, indirect, and induced) labour income, as reported in Table 4.7-3, is 25% of total (direct, indirect, and induced) GDP. In the economy as a whole, labour income comprises 60% of GDP.²³ Ordinarily, this might suggest that estimates of GDP are overstated. However, again, the highly profitable nature of diamond mining is probably accountable for the difference.

Competing Activities

In reporting economic impacts from a project, it is necessary to consider income that may be lost from competing activities. The proponent has considered this in Sections 4.7.9 and 4.8.5.4 and has determined that the residual effects (after mitigation) on traditional economies, harvesting, tourism and recreation, will be negligible. Thus, in this case, it has not been necessary to adjust the impacts from the project to account for opportunity costs in terms of lost employment and income from other activities.

Overall Assessment

There are a number of factors that suggest that the estimates of total (direct, indirect, and induced) incremental employment and income generated by the project may be slightly overstated. However, estimates of direct employment and income are entirely reasonable and, given the availability of a year's worth of actual data, are, in fact, more reliable than is the case in most analyses of this nature. Given that direct effects constitute about half of total effects in the case of employment and labour income, and 80% of total effects in the case of GDP, and given that there is always a margin of error associated with impact estimates, the estimates reported in the EAR are reasonable.

4.4 IMPACTS ON GOVERNMENT REVENUES

4.4.1 Terms of Reference Requirements

Section 3.3.3 of the Terms of Reference²⁴ require the proponent to discuss impacts the project will have on federal and territorial revenues and costs, and on local government finances. These issues are addressed in Section 4.7.4.4 of the EAR.

4.4.2 Appropriateness of Analytical Approach

The analysis in the EAR is based on the premise that development of the three new pipes will sustain, over three more years, tax revenues and expenditures already associated with the mine at output levels of 18,000 t/d. The analysis considers revenues and expenses generated directly by

²³ 2000 NWT Socio-Economic Scan, GNWT, June 2000

²⁴ Lines 499 and 500.

the project. The results, derived by deducting expenses from revenues, reflect the net direct revenues each government can expect to continue receiving over each of the three years that the Sable, Pigeon and Beartooth pipes contribute to the mine's life. The proponent correctly points out that there would also be revenues from indirect and induced activities which would be in addition to the direct amounts.

Because of excess capacity in local infrastructure and services, and the lack of in-migration due to the project, net local revenues are not expected to change.

These approaches are appropriate.

4.4.3 Reasonableness of Results and Conclusions

Territorial and federal government revenues generated directly by the project are shown in Table 4.7-4. The estimates appear to be reasonable. Personal income taxes are 43% of direct labour income, which is an acceptable tax rate given the mine's average pay levels. Corporate income taxes appear reasonable, or low, in comparison to estimates of direct GDP presented in Table 4.7-1. And finally, as noted above, the figures do not include indirect or induced revenues which results in conservative estimates.

Government expenditures or other losses (such as those from the Formula Finance Grant) which are associated with the project appear to have been appropriately considered as well.

The resulting estimates of net fiscal revenues are therefore probably fairly accurate.

4.5 OPPORTUNITIES FOR LOCAL, REGIONAL, AND TERRITORIAL SUPPLIERS AND FOR ECONOMIC DIVERSIFICATION

4.5.1 Terms of Reference Requirements

Section 3.3.3 of the Terms of Reference²⁵ require the proponent to discuss the impacts of the project in terms of:

- opportunities for local, regional, and territorial businesses to supply goods and services; and,
- economic diversification.

These issues are addressed in the EAR in Sections 4.7.5, 4.7.6, Appendix B (“Annual Report on Local Purchases, 1999 Operational Phase”), and three responses to Information Requests.²⁶

²⁵ Lines 490-492, 493-494, and 502.

²⁶ Two of the responses were to questions from Lucaino Azzolini, entitled “Total Ekati™ Expenditures, and Sable, Pigeon and Beartooth Pipes Indirect and Induced Impacts on the Economy” and from Brett Hudson, entitled “future Northern Business Participation at 18,000 t/d.” They are identified here because they are cited later in this analysis.

4.5.2 Appropriateness of Analytical Approach

Opportunities for Suppliers

The analysis in the EAR regarding the opportunities the project will provide for local businesses to supply goods and services to the mine is based on data on the geographical distribution of expenditures during the 1997-98 construction phase for the existing mine and during the first year of production (1999).

Construction data are shown in Table 4.7-6. They indicate that, of total construction expenditures of \$688.7 million during 1997 and 1998, 15% was spent in Aboriginal businesses and roughly another 30% was spent in other Northern businesses. Purchases from northern businesses were roughly \$150 million in 1997 and \$171 million in 1998.²⁷

Operational expenditures are shown in Tables 4.7-7 and 4.7-8, and in Appendix B. These data show that, during 1999, purchases from NWT businesses (including Aboriginal and non-Aboriginal) totalled \$280.3 million, equal to nearly 78% of total operational spending.

Given the availability of actual data, their use is an ideal approach to addressing the issues identified in the Terms of Reference.

Diversification

The Terms of Reference differentiate between opportunities to supply goods and services to the mine and economic diversification. It is assumed that the latter refers to downstream, or value-added, diversification. Analysis of this in the EAR focuses on the BHP sorting and valuation facility, and BHP's commitment to supply rough diamonds to local diamond cutting and polishing firms. This is more comprehensive a discussion of downstream diversification than is included in most economic impact analyses and is likely as complete as it can reasonably be, given that most value-added diversification is beyond the proponent's sphere of influence and is more speculative than upstream.

The proponent is correct in suggesting that income and employment from value-added activities will be in addition to those estimated in the section on direct, indirect, and induced impacts.

4.5.3 Reasonableness of Results and Conclusions

The EAR suggests that analysis of actual data from construction and the first year of production shows that:

- purchases from northern businesses substantially exceeded expectations both during construction and during the first year of production;

²⁷ EAR, p. 4-180.

- the ability of northern businesses to supply \$150 million of goods and services in 1997, \$171 million in 1998, and \$280 million in 1999, suggests that northern businesses can supply the \$78.3 million²⁸ that BHP expects to purchase from them during each of the three years that the three new pipes will contribute to the life of the mine (at 18,000 t/d); and,
- “the level and distribution of [BHP’s} expenditures indicate the significance of BHP’s role in diversifying and strengthening the NWT economy.”²⁹

These conclusions are valid but some additional information or clarification would be helpful to the Board.

1999 Expenditures

As noted above, purchases from northern businesses during the first year of production, totalled \$280 million. In an information request response, the proponent notes that at 9000 t/d, annual purchases from northern businesses are estimated at \$57.3 million.³⁰ The same response notes that spending for the first year of production includes “ramp-up capital purchases.” Ramp-up purchases from northern businesses during the first year of production therefore appear to have totalled \$223 million.

Given that ramp-up purchases include “additional equipment, infrastructure, and specialized labour,”³¹ purchases of \$223 million from northern businesses seem quite high and may warrant some clarification. It would also be useful to know how recurring (as opposed to one-time) expenditures have been distributed among Aboriginal, other northern, and non-northern businesses.

Purchases from Distributors/Wholesalers versus Producers

Purchases from northern businesses, as shown in Tables 4.7-7 and 4.7-8, are based on definitions and categories provided in the “Annual Report on Local Purchases” contained in Appendix B. According to this report, a “northern business” is “...any business organization in which Northern Residents have substantial management authority or in which Northern Residents have a significant working interest.” The industry types, into which purchases have been divided in Table 4.7-8, were developed by BHP and include:

- Air support
- Rent and accommodations;
- Land freight;
- Contractors;
- Northern labour service;
- Community relations;

²⁸ EAR, p. 4-179.

²⁹ EAR, p. 4-182.

³⁰ BHP Diamonds Inc., **Information Requests and Responses**, July 2000, question from Luciano Azzolini, op cit.

³¹ EAR, p. 4-181, footnote 9.

- Goods and services;
- Fuel and lubes; and,
- Fees, licenses, assessments.

The list above does not include a separate category for purchases made through distributors or wholesalers. However, evidence suggests that these are sizeable.³² As the EAR notes, BHP "encourages southern suppliers to affiliate with local and Aboriginal business or, alternatively, to establish a presence in the North.."³³

Many of the goods required by the mine are not produced in the north and must be "imported". Purchasing these supplies through a northern distributor is clearly better for the NWT economy than buying them direct from an outside supplier since wholesaling does create income and employment for the local economy. However, if it is available, information regarding the extent of wholesale purchases could be useful in identifying the extent and nature of opportunities for import replacement and, perhaps, enhancement measures to achieve this.

4.6 OPPORTUNITIES FOR AND AVAILABILITY OF NORTHERN WORKERS AND SKILLS

4.6.1 Terms of Reference Requirements

Section 3.3.3 of the Terms of Reference³⁴ require the proponent to:

- Estimate employment by skills category, including estimates of local and aboriginal participation;
- Discuss barriers to employment; and,
- Discuss the availability and use of skilled workers in the NWT to meet job requirements.

These issues are addressed in Sections 4.7.7, 4.7.8, and Appendix B of the EAR, and in several responses to Information Requests.

4.6.2 Appropriateness of Analytical Approach

The analysis is based on actual data regarding the distribution of employment for the first year of production which show that:

- BHP's mitigation/enhancement measures to reduce barriers to employment have been and will continue to be successful given that the addition of the three new pipes will not change these policies or the distribution of positions at the mine.

³² Table 4.7-8 shows northern purchases of capital equipment of \$60 million in 1999 and of "other goods and services" of \$134 million. According to data from the GNWT, however, the total value of manufacturing shipments in the NWT from April/99 to March/00 was \$23 million.

³³ EAR, p. 4-183.

³⁴ Lines 487-488, 495, and 496.

- Northern and aboriginal participation has generally exceeded EIS and Socio-Economic Agreement objectives and should persist over the life of the proposed development.

4.6.3 Reasonableness of Results and Conclusions

The analyst seldom has actual data upon which to base predictions of employment or the distribution of that employment. In addition, the three new pipes will not create new employment but rather will sustain existing levels. This, in combination with the intention of the proponent to continue its enhancement policies and regular monitoring, mean that the quality of the analysis of employment opportunities and availability is at least as good as, and probably more reliable than, the predictions contained in most economic impact analyses.

4.7 INFLATIONARY IMPACTS

4.7.1 Terms of Reference Requirements

Section 3.3.3 of the Terms of Reference³⁵ asks the proponent to analyse the project's impacts on inflation and the cost of living. This is addressed in Section 4.7.10 of the EAR.

4.7.2 Appropriateness of Analytical Approach

In order to assess the inflationary impacts of the project, the proponent refers to the CPI (consumer price index) for Yellowknife for 1998 and the first eleven months of 1999. The results - 0.9% for 1998 and 1.2% for 1999 - are presented as evidence that the mine has not led to increases in the cost of living in Yellowknife or the NWT.

4.7.3 Reasonableness of Results and Conclusions

It is reasonable to conclude that the mine has not had inflationary impacts on Yellowknife and that it is unlikely to in the future given that the three new pipes will not increase BHP's demand for labour or supplies. It is not clear if inflationary impacts have occurred in other communities affected by the project; this analysis is limited by the fact that such data are not published. However, even if there have been effects on cost of living in communities other than Yellowknife, development of the three new pipes will not add to it for the reason that it will not create any demands for workers or goods beyond that already associated with the existing mine.

³⁵ Line 501.

5.0 CUMULATIVE EFFECTS

5.1 TERMS OF REFERENCE REQUIREMENTS

Section 3.5 of the Terms of Reference require the proponent to evaluate effects, including economic effects, that are likely to result from the proposed development in combination with other developments. As a minimum, these developments were to include the existing EKATI™ mine, the Diavik diamond project, and the Echo Bay Mine Ltd. winter road and Lupin mine.

Cumulative socio-economic effects are addressed in Section 4.9.4.6 of the EAR.

5.2 APPROPRIATENESS OF ANALYTICAL APPROACH

The proponent has taken the view that "where the proposed development has a negligible socio-economic residual effect, it is not a contributor to cumulative socio-economic effects."³⁶ In addition, the approach taken in the EAR is that "...only those effects that have changed from the 1995 EIS and the Diavik diamonds Project EA will be addressed."³⁷ Table 4.7-13 of the EAR indicates that there has been no change in the significance of the residual socio-economic effects from that determined in the 1995 EIS. Thus, no socio-economic effects were included in the EAR's CEA.

5.3 REASONABLENESS OF RESULTS AND CONCLUSIONS

Direction from CEAA indicates that the effects considered in the cumulative effects analysis "...must result, at least in part, from the project..."³⁸ Having a negligible effect is different from having no effect; thus, a literal interpretation of this statement would suggest that even negligible residual impacts should be considered in the cumulative effects assessment.

However, the same CEAA guide indicates that "when assessing cumulative environmental effects, it is important to ensure that the level of effort is appropriate to the scope of the project..."³⁹ Given the size of the current proposal relative to the original mine proposal, and the extent of the analysis included in the 1995 EIS, it is reasonable to restrict the analysis to those effects for which the assessment of significance has changed since the initial review.

It follows from this that the exclusion of socio-economic effects from the cumulative assessment for this project is reasonable.

³⁶ Ibid.

³⁷ EAR, p. 4-226

³⁸ Canadian Environmental Assessment Act, **Reference Guide: Addressing Cumulative Environmental Effects**, www.ceaa.gc.ca/publications/guides_e.htm

³⁹ Ibid.

6.0 OVERALL ASSESSMENT OF ECONOMIC ANALYSIS IN THE EAR

6.1 FINDINGS

The main findings from this review of BHP's economic analysis are that:

- The proponent has addressed all of the economic issues identified in the Terms of Reference.
- The extent of the analysis provided is sufficient given the scope of the project under review and the existence of earlier analysis in the 1995 EIS.
- The approaches taken to address each issue are generally sound and the conclusions reached are reasonable, although some additional information might have been useful.
- Specific results of the review are that:
 - Alternatives for the development have been adequately considered and the results, although not verifiable quantitatively, are reasonable.
 - It is possible that estimates of indirect and induced economic impacts from operations are slightly overstated and not entirely incremental, although additional information is needed to determine this. However, given the reliability of the direct impacts, and the limitations of economic impact analysis in general, the impact estimates are adequate for decision purposes.
 - It appears that impacts from development of the three new pipes have not been considered and would represent employment and income in addition to those created by project operation.
 - Net government revenues appear to have been accurately estimated.
 - The analysis of opportunities for northern suppliers is generally adequate, although additional information could provide a fuller understanding of the nature of northern business participation and, perhaps, a basis for improving measures to enhance this participation. Specifically, the isolation of one-time expenditures from 1999 operating data would provide a picture of the distribution of recurring spending. Also, it would be useful to know how much of BHP's purchases were made through northern wholesalers or distributors as opposed to goods and service producers.
 - Opportunities for and availability of northern workers have been adequately considered and the results are probably more reliable than those in most economic impact analyses.
 - The potential for impacts on cost of living has been adequately addressed.
 - An analysis of the impacts on communities from direct hiring and purchasing would help the Board to understand the distribution of economic benefits within the NWT that is

associated with the existing mine and which, therefore, can be expected to persist with the three new pipes. However, this information would be useful primarily for developing community-specific mitigation or enhancement measures. It would not have a bearing on the Board's decision regarding the benefits of the project to the NWT as a whole.

- Cumulative impacts have been adequately addressed considering the size of the project and the availability of analysis in the 1995 EIS.

6.2 INTRINSIC VALUES

An issue that was raised by the MVEIRB in its review of the Diavik project Comprehensive Study Report and which may be raised in the context of this project concerns the intrinsic value associated with habitat and wildlife that may be impacted by the project.⁴⁰ However, although this is a highly relevant issue, intrinsic values do not fit within the context of an economic impact analysis. They would fit within the context of a social benefit-cost analysis; however, similar to other regulatory practices, a social benefit-cost analysis is not required under the Terms of Reference for this project. The approach implicit in the Terms of Reference is a type of “multiple account analysis” where, rather than being stated in monetary terms, the impacts of the project on habitat and wildlife is considered in environmental (rather than economic) terms.

6.3 CONCLUSIONS

It is our professional opinion that the economic analysis in BHP's EAR provides information which is sufficient, both in terms of extent and accuracy, for the Board to reach a decision as to the economic benefits of the proposed development .

⁴⁰ MVEIRB, Views on the Diavik Diamonds Project Comprehensive Study Report, October 7, 1999