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OPINION ON INVESTIGATIONS CONDUCTED  
BY COMINCO LTD. ON THE  
FISH LAKE PROPERTY OF  
TASKEKO MINES LTD.

Toronto, Canada  
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R. P. Ehrlich, P.Eng.  
Watts, Griffis and McOuat Limited  
Consulting Geologists and Engineers

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1.0 SCOPE OF REPORT

This report gives the writer's opinion on the work and investigations conducted by **Cominco Ltd.** (Cominco) concerning certain obligations under the agreement (Agreement) dated August 10, 1979, entered into between **Taseko Mines Limited** (Taseko) and **Bethlehem Copper Corporation** (Bethlehem), predecessor of Cominco, regarding the Fish Lake property.

Specifically I will give my opinion whether Cominco performed sufficient work and carried out sufficient investigations to properly conclude whether or not it is economically feasible immediately to place the Fish Lake property into commercial production. This opinion is based on the assumption that Cominco had an obligation to do sufficient work to reasonably come to a conclusion as to the economic feasibility of this project; but had no obligation to complete a Final Feasibility Study, as defined later in this report, regardless of the economic feasibility. I will also give my opinion as to the meaning of certain words and phrases of a technical nature which have a unique meaning in the mining industry.

In arriving at my opinion I reviewed the above referenced agreement, the pleadings and numerous reports by Cominco, Bethlehem and others describing the geological, geophysical, geochemical and other exploration work performed on the property as well as metallurgical data and financial evaluations. This includes information and data of work performed by:

- . Phelps-Dodge between 1960 and 1966.
- . Taseko in 1969.
- . Nittetsu in 1970.
- . Taseko again in 1971 and 1972.

*If no feasibility study is indicated by exploration then prop should be returned*

- . Quintana in 1973 and 1974.
- . Bethlehem and Cominco between 1979 and 1987.

The information and data which was reviewed is disclosed in the List of Documents of the parties.

## 2.0 QUALIFICATIONS

### 2.1 GENERAL

I am a:

- . Graduate in Metallurgical Engineering with Honours from the Faculty of Applied Science of the University of Toronto in 1946.
- . Member of the Association of Professional Engineers of Ontario.
- . Designated Consulting Engineer of the Association of Professional Engineers of Ontario.
- . Member of the "Ordre des Ingenieurs du Quebec".
- . Charter Engineer of the U.K.
- . Member of the Canadian Institute of Mining and Metallurgy.
- . Member of the Society of Mining Engineers of AIME.
- . Fellow of the Institution of Mining and Metallurgy of the U.K.

For the past 34 years, I have been employed by mining companies, engineering and construction companies and consultants involved in plant design and construction and project evaluations and feasibility studies for many mineral and metal commodities, including copper, lead, zinc, molybdenum, gold, silver, uranium, asbestos, potash, silica sand and iron ore.

1985 to Present - Chief Metallurgical Engineer - Watts, Griffis and McOuat Limited - Toronto.

As Chief Metallurgical Engineer, I have had the responsibility or have been involved in a number of mineral property evaluations including:

Echo Bay - Round Mountain	-	Gold project in Nevada
Teck-Corona	-	Gold project in Ontario
T.V.X. - Morro do Ouro	-	Gold project in Brazil

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Echo Bay - Alaska Juneau	-	Gold project in Alaska
Nevada Goldfields - Empire	-	Gold project in Colorado
Summitville Mines	-	Gold project in Colorado
Ridgeway Mining Co.	-	Gold project in South Carolina
Echo Bay-Tenneco	-	Gold projects in Nevada and California
Selbaie Mine	-	Copper-Zinc project in Quebec
Golden Patricia	-	Gold project in Ontario

In all of the above projects, information from geological, geophysical and geochemical surveys and diamond drilling was combined with metallurgical data, and financial evaluations were prepared to determine the value of each operation. Based upon these results, decisions were made regarding future programs for each property, whether they be further exploration work, further metallurgical work, financing the project into production, or not to proceed further.

1974 to 1985 - Vice President - Bechtel Canada Ltd. - Toronto

Responsible for engineering, construction and project management for projects in Canada and responsibility for, or involvement in, the following projects.

Preparation of a feasibility study for the Cerro Colorado copper project in Panama for Rio Tinto-Zinc. This study included interpretation of geological data, calculation of ore reserves, interpretation of metallurgical test results, mine and plant design, cost estimates and project evaluation.

Review of feasibility study and subsequent design and construction of the Lupin gold mining and recovery facilities in the Northwest Territories for Echo Bay Mines Ltd.

Preparation of a feasibility study for the Key Lake uranium project in Saskatchewan for Uranerz Exploration and Mining Ltd. The work included the evaluation of geological and metallurgical test data, calculation of ore reserves, design of the open pit and design and cost estimating for the process plant and ancilliary facilities.

Feasibility study and subsequent engineering and construction for all the facilities for the Polaris lead-zinc mine for Cominco Ltd. located on Little Cornwallis Island in Canada's High Arctic. The work included metallurgical testwork, plant design, project evaluation followed by construction of the facilities. The feasibility study was based on geological and ore reserve data provided by others and combined with metallurgical, design and cost data developed by Bechtel.

Preparation of a feasibility study for a lead-zinc mine near Dublin in Ireland for Bula Ltd.

Feasibility study for Valley Copper, a subsidiary of Cominco Ltd., involving a large copper deposit in the Highland Valley of B.C. The work included metallurgical testwork, pilot plant testing, engineering design and financial evaluations.

Preparation of a feasibility study for an open pit asbestos mine in northwestern Quebec for Abitibi Asbestos Ltd. This included the design of an open pit based on geological and fibre test data, design of an asbestos recovery plant and shipping facilities, marketing investigations and financial analysis of the proposed operation.

Preparation of a feasibility study for the La Troya lead-zinc project in Spain for Cominco Ltd. This included evaluating geological data and designing an underground mine and surface processing facilities. Capital and operating costs were then prepared and the project viability determined.

1971-1974 - Director of Technical Services - Brinco Ltd. (RTZ Group) - Montreal

Responsible for investigations into the viability of mineral projects including a zinc project in Newfoundland, an asbestos project in Quebec, a uranium enrichment plant in Labrador and a copper mine in Newfoundland. Worked with the exploration and geological department in evaluating mineral prospects and contributed to the decision making process regarding the future work on the various properties.

1969 - 1971 - Project Manager - North America - Bougainville Copper Ltd. (RTZ Group) - San Francisco.

Bougainville Copper completed the world's largest grass roots copper mine, concentrator and shipping and ancillary facilities on the Island of Bougainville in Papua New Guinea in 1982. I was responsible for the preparation of the Final Feasibility Study, design of the process plant, shipping facility and power plant, procurement of major equipment and assisted with the financing negotiations. The plant was initially designed with a capacity of 90,000 tons per day which has now been increased to nearly 155,000 tons per day. The ore has a grade of 0.70% copper and 0.018 oz Au/ton. The Final Feasibility Study supported the financing of US\$450, the cost of the project.

1967 - 1969 - Consulting Metallurgical Engineer - Kennecott Copper Corporation -  
Salt Lake City

I had the technical responsibility for the efficient operations of Kennecott's metallurgical plants in the U.S. This consisted of four copper concentrators, two lead-zinc concentrators, four copper smelters and two copper refineries. While at Kennecott, I assisted in the preparation of feasibility studies for copper projects in Puerto Rico, Montana and Alaska and a copper leaching operation in Arizona. I was later responsible for the technical aspects of the construction of the copper vat leaching plant.

1964 - 1966 - Manager, Minerals Division - General Engineering Co. - Toronto.

General Engineering (Geco), which has since been taken over by SNC, was a medium sized mining and mineral plant engineering company. As manager of the Minerals Division, I was responsible for all mineral related activities from business development through project evaluation, financial analysis, engineering and construction. During the two years at Geco, I was involved in a copper-nickel concentrator in northern Ontario, two lead-zinc plants in Missouri, a potash operation in Saskatchewan and an yttrium plant in Ontario.

1953 - 1964 - Chief Engineer, Chief Metallurgical Engineer - Rio Algom Ltd. and  
predecessor companies (RTZ Group) - Toronto

In the nearly twelve years I spent with Rio Algom, I was involved with all their mineral projects in Canada as well as performing work for Rio Tinto-Zinc Corporation on offshore projects. These activities included:

- . Development of metallurgical process, economic evaluation and design and construction supervision of seven uranium plants in the Elliot Lake area of Ontario.
- . Metallurgical supervision of the Elliot Lake uranium operations including financial evaluations of plant modifications and improvements.
- . Assistance to the exploration department in selecting exploration targets and the financial evaluation of the results leading to decisions related to future activities.
- . Member of a team who developed the Final Feasibility Study for the Palabora copper project in South Africa. This 35,000 ton per day copper mine, concentrator and smelter was later designed and

constructed and was placed into production in 1965. I assisted with the metallurgical testwork, plant design and economic analysis which led to the financing of this project.

- . Assisted in the preparation of a feasibility study for an iron ore project in Brazil.
- . Assisted in the preparation of a feasibility study for an iron ore project in Northern Ontario.
- . Assisted in the financial evaluation of the Mines de Poirier copper zinc project in northwestern Quebec.
- . Prepared financial evaluations for silica sand, thorium, lead-zinc and copper projects.

1948 - 1953 - Mill Superintendent - United Keno Hill Mines - Elsa, Yukon Territories

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I was responsible for the operation of the 500 ton per day silver-lead-zinc concentrator and assisted with its construction.

1946 - 1948 - Metallurgist - Kerr Addison Gold Mines - Virginiatown, Ontario

Assisted in the operation of this 4,500 ton per day gold recovery plant and developed a new process which improved recovery.

## 2.2. SPECIFIC

Since 1960, I have been involved in the evaluation of mineral properties including the preparation of feasibility studies. These have included:

- . The preparation of a Final Feasibility Study and "Bankable Document" for the copper operation of Palabora Mining Company in South Africa.
- . The preparation of a Final Feasibility Study and "Bankable Document" for Bougainville Copper Ltd. in Papua, New Guinea.
- . The preparation of an evaluation study for the proposed Cerro Colorado copper project in Panama.
- . The preparation of a number of financial evaluations and feasibility studies for the Valley Copper project in B.C.
- . The financial analysis of the Troy copper deposit in Montana.

*Asst. Min.  
has much  
was spent on  
these before  
a feasibility study  
was done.*

- . The financial evaluation of the Tanama copper deposit in Puerto Rico.
- . A number of other financial evaluations and feasibility studies on lead, zinc, uranium and asbestos properties.

With my many years of involvement with mineral plant design, construction and project management, I understand the process of collecting geological, mining and metallurgical data on mineral properties and translating this information into financial data from which the viability or feasibility of the project can be established.

### 3.0 FISH LAKE PROJECT EVALUATION

#### 3.1 FEASIBILITY STUDY (PROJECT EVALUATION) REQUIREMENTS

In order to perform an evaluation of a mineral project, data must be collected and work performed on the property in order that sufficient information is available for a proper assessment to be made. Studies or reports that establish the economics of a mineral enterprise, or for that matter any other enterprise, go by many different titles including feasibility studies, evaluation reports, economic evaluation, Final Feasibility Studies and others.

The purpose of preparing financial analyses at different stages in the development of a project, is to establish the current economic viability of the enterprise to allow decisions to be made whether, and how, to proceed further, or whether to stop work. The level of accuracy of these studies will naturally depend upon the amount of work done up to the time the study is prepared. The work performed may include the following activities:

#### **Exploration -**

- Geological mapping of the property.
- Geophysical survey of the property.



- Geochemical survey of the property.
  - Trenching of the surface showings. *NOT sufficient*
  - Diamond and percussion drilling of the mineral targets. *NOT SUFF*
  - Analysis of the drill cores and chip samples.. *NOT SUFF*
- Calculation of mineral inventory and ore reserves.

**Metallurgy -**

- Mineralogical examination of mineral samples.
- Bench scale laboratory tests of small samples.
  - Pilot plant testing of bulk sample. *No*
  - Preparation of process flowsheet. *?*

**Mining -**

- Determination of mining method. *NOT optimized or finalized*
- Layout of mine, underground or open pit. *No*
- Geotechnical (rock mechanics) investigation. *No*

**Plant Design -**

- Selection of plant capacity. *No*
- Location of access corridors. *No*
- Source of power supply. *No*
- Investigation of environmental permitting requirements. *(No very little)*
- Tailings disposal location. *No*
- Mine and plant equipment selection. *No*
- Preliminary design drawings. *No*

± 18%

**Financial -**

- . Preparation of capital cost estimates. *No*
- . Preparation of operating cost estimates. *No*
- . Evaluation of future metal prices. *YES*
- . Preparation of pro-forma financial analyses including profit and loss, present value and return on investment.

Particular circumstances concerning each mineral deposit will dictate the extent to which some or all of the above activities need to be performed to establish its economic feasibility.

A feasibility study can be described as the evaluation of the technical and economic viability of a project. It can also be described as a project evaluation or evaluation report.

Final Feasibility Studies are frequently called "Bankable Documents" when they are used for financing purposes. Final Feasibility Studies are normally only carried out under two particular situations:

- (a) when a project is marginal and the necessary information must be defined as accurately as possible to assure the owners and the financial institutions that the project is viable, or
- (b) when a project is clearly economically feasible as shown by prior economic evaluations or studies and all data must be defined for financing purposes.



Final Feasibility Studies normally require sufficient drilling to be performed to allow a mine plan to be prepared; metallurgical pilot plant tests on a bulk sample to obtain necessary design criteria and preliminary engineering design in order that capital and operating costs can be accurately calculated.

3.2 WORK PERFORMED AT FISH LAKE

As shown on the activity chart (Figure 1), much of the work described above has been performed by Cominco and others at Fish Lake over the twenty-seven years that have elapsed since Phelps-Dodge began work on the property in 1960. These are as follows:

- . Geological mapping was carried out during eight annual programs, three of which were performed by Cominco.
- . Geochemical surveys were carried out during five annual programs, three of which were performed by Cominco.
- . Geophysical surveys were carried out during six annual programs, three of which were performed by Cominco.
- . Diamond and percussion drilling and assaying of samples was carried out during ten annual programs amounting to nearly 25,000 metres in 169 holes. Over 60% of this work was performed by Cominco.
- . Reserves were calculated and recalculated frequently, generally as new information became available.
- . Metallurgical tests were carried out on three different drill core samples, two of these programs were performed by Cominco.
- . Mineralogical examinations were performed on four different samples, one by Cominco.
- . Capital and operating costs were determined and financial evaluations prepared at six different times, with five of them either performed by Cominco or by engineering companies on behalf of Cominco.

**Table 1**  
**FISH LAKE PROJECT – ACTIVITY CHART**

Year	1960 to 1966	1969	1970	1971	1972	1973	1974	1975	1979	1980	1981	1982	1983	1984	1985	1986	1987	Total
Company	Phelps-Dodge	Tas-eko	Nitt-etsu	Tas-eko	Tas-eko	Quin-tana	Quin-tana	Quin-tana	Beth-lehem	Both-lehem	Beth-lehem Com-inco	Com-inco	Com-inco	Com-inco	Com-inco	Com-inco	Com-inco	
<b>Activity</b>																		
Geological Mapping	•	•		•	•	•				•	•	•						
Geochemical Surveys	•	•								•	•	•						
Geophysical Surveys	•	•	•							•	•	•						
Trenching	•																	
Diamond Drilling	•	•	•		•	•	•				•	•		•				
--Metres	723	1,036	236		211	3,058	1,731				9,637	710		1,003				18,345
--Holes	8	6	4		3	15	9				39	12		5				101
Percussion Drilling		•							•	•	•	•						
--Meters		1,265							1,106	2,158		1,550						6,079
--Holes		12							14	23		19						68
Reserve Calculations		•				•				•	•	•	•	•				
Metallurgical Testing						•					•		•					
Mineralogical Studies				•		•	•				•							
Financial Evaluations								•			•			•	•	•	•	
Expenditures \$	100,000	100,000	50,000	50,000	← 450,000 →					150,000	1,450,000	265,000	45,000	100,000	15,000	15,000	10,000	2,800,000

### 3.3 RESULTS OF WORK

In order to determine whether Cominco has properly established the economic feasibility of the Fish Lake deposit, one must look at the results obtained.

The geological, geochemical, geophysical and drilling work has established that there is a mineral resource at the Fish Lake property. The metal content of this resource can not be in question, because all of the reserve calculations that were carried out have established similar grades. All metallurgical test programs established that approximately 88% of the copper and in excess of 65% of the gold can be recovered in a saleable copper concentrate, which results are typical for porphyry copper deposits of this type.

The significant factor that clearly determines the economic viability of the Fish Lake project at this time is the price of copper and further exploration, metallurgical testing and engineering will not affect this factor. The price of copper is dictated by the market place.

The feasibility studies based on actual data obtained from the Fish Lake project in regard to reserves, ore grade and metallurgy; on recent historical data for capital and operating costs, from similar copper operations, have, combined with the metal prices utilised, properly demonstrated that the project is not economically feasible. Cominco prepared, dated October 15, 1984, an "Economic Evaluation of the Fish Lake Project". In May, 1986 Wright Engineers, on behalf of Cominco, prepared a report on the Fish Lake project entitled "Review of Engineering and Financial Data." Addenda to this report were prepared by Wright's in November 1986 and again November 1987. I agree that the capital and operating costs used in these evaluations are realistic and not on the conservative side. The metal prices used in the three reports by Wright's and in Cominco's 1984 Economic Evaluation are listed below:

		Cominco October 1984	Wright Engineers		
			May 1986	November 1986	November 1987
Copper	- US\$/ lb	0.583	0.650	0.615	0.750
Gold	- US\$/oz	345.00	340.00	407.00	450.00
Silver	- US\$/oz	7.48	5.20	5.75	7.00
Canadian Dollar	- US\$	0.76	0.72	0.72	0.75

The May 1986 review indicates that metal prices would have to increase by more than 50% in order to obtain a positive net present value at a 10% discount rate. For 1987, the metal prices would have to increase by nearly 20% to obtain a positive net present value at a 10% discount rate.

Discount rates used in economic evaluations of mining projects relate to the risks involved such as metal prices, changes in government regulations, unforeseen operating problems and other similar unknowns. When one can invest in Guaranteed Investment Certificates, which carry little or no risk, and obtain a 10% or more return, one would only invest in a mining project at the same rate if it is felt there was an upside potential.

In the case of Fish Lake, this upside potential can only be in metal prices and these are very difficult, if not impossible to predict. Informed sources regarding copper prices are divided on the future. The majority believe copper prices will decline in real terms over the next number of years, while the rest believe they will stay constant. There will be a large quantity of new production coming on the market over the next few years from announced projects, Kennecott Bingham Canyon, OK Tedi, Neves Corvo, Escondido and others not yet identified, which will satisfy the predicted increase in consumption currently estimated at 1% per annum.

### 3.4 DISCUSSIONS OF RESULTS

Information obtained from exploration and development programs of mineral properties often can quite quickly indicate the viability of the project. In the case of porphyry copper deposits like Fish Lake, much historical data on capital and operating costs is available, so these costs can be readily established with a reasonably degree of accuracy.

The problem with the Fish Lake deposit is the grade of the reserve and further work will not change this mineral content. In actual fact, according to National Policy 2A issued by the Canadian Provincial Security Regulators, and the United States Securities Exchange Commission under Item 17A of the Securities Act of 1933 as amended in March, 1984, the mineralized material at Fish Lake **can not** be called ore: BS!

- . Ore is defined as a natural aggregate of one or more minerals which, at a specified time and place, may be mined at a profit or from which some part may be profitably separated."

Further metallurgical testing would not significantly change the economic feasibility of the project as the results obtained from testing to date are what could be expected from porphyry copper deposits exhibiting the geological and mineralogical character of the Fish Lake material. For instance, the results from a pilot plant test using a bulk sample would not effectively change the feasibility of the project as pilot plant work is normally performed to confirm laboratory results and obtain design criteria. Therefore to prepare a Final Feasibility Study on the Fish Lake deposit at this time would not be prudent. This leads to the conclusion that in 1984, Cominco was fully justified to discontinue work on the property. The same conclusions could be reached based on evaluations performed in 1986 and 1987. BS!

### 3.5 CONCLUSIONS

- a) The above discussion of the work performed by Cominco and others on the Fish Lake deposit of Taseko Mines and the results obtained

demonstrates, in my opinion, that at metal prices in effect between 1984 and 1987, it was not economically feasible to place the Fish Lake deposit into production during this period.

- b) The most important factor affecting the economics, the copper and gold grade, has been established as the result of a thorough investigation and further work is unlikely to change the results.
- c) It is my opinion that Cominco has performed sufficient work and carried out all reasonable investigations to properly conclude that in late 1984 or anytime since, it was not economically feasible immediately to place the Fish Lake property into commercial production.
- d) To prepare a Final Feasibility Study for the Fish Lake project in 1984 or at any time since, would not have been necessary and therefore not economically prudent as the work and investigations carried out by Cominco have clearly established that the project is not economically viable and in fact not even marginal.
- e) It is therefore my opinion that Cominco has performed sufficient work to establish that "it is not, at this time, economically feasible immediately to place the Fish Lake property in commercial production."

BS!

HAS NOT  
Performed  
Sufficient

Respectfully submitted,

