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A VALUATION OF

THE

SHERWOOD GOLD MINE PROPERTY

JULY 1991

prepared by:

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July 15, 1991

Mr. Harold Forzley
S.C.M. Services Ltd.
700 - 1177 West Hastings Street
Vancouver, B.C.
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Dear Mr. Forzley:

Ross Glanville & Associates Ltd. has determined that the Fair Market Value of the Sherwood Gold Mine Property as of November 25, 1988, was approximately $15.8 million. For this purpose, Fair Market Value means the highest price, expressed in money, obtainable in an open and unrestricted market between knowledgeable, prudent, and willing parties dealing at arm's length, who are fully informed and not under compulsion to transact. In this case the best use (resulting in the highest price) of the property to the owners is as a mining operation.

Although the estimated fair market value is $15.8 million, because of the normal risks inherent in exploration and mining, as well as the variability of external factors such as the price of gold, it is my opinion that a reasonable range of value is between $10.0 million and $20.0 million.

Yours very truly,
Ross Glanville & Associates Ltd.

Ross Glanville
B.A.Sc., P.Eng., M.B.A., C.G.A.

RG/dm
Encl.

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EXECUTIVE SUMMARY

Ross Glanville & Associates Ltd. (Glanville) was commissioned by S.C.M. Services Ltd. to determine the Fair Market Value of the Sherwood Gold Mine Property as at November 25, 1988. For this purpose, Fair Market Value means the highest price, expressed in money, obtainable in an open and unrestricted market between knowledgeable, prudent, and willing parties dealing at arm's length, who are fully informed and not under compulsion to transact. In this case, the best use (resulting in the highest price) of the Sherwood Gold Mine Property to the owners is as a mining operation.

The Sherwood Gold Mine Property is an advanced mining property since it has proven and probable reserves*, underground development (adits and raises) in place, and many excellent targets to explore via extensions of existing adits and drilling from underground and surface (where other extensive vein systems have already been discovered).

The determination of the fair market value of the Sherwood Gold Mine Property was based on geological, mining, and economic assessments, together with an analysis of "comparable" gold properties. Glanville relied largely on the adjusted discounted cash flow valuation method (see page 8 for a brief description of the method), however, the comparable properties do give an indication of the substantial values that are placed on these types of gold properties. Although a great many methods have been utilized to value mining properties (see Appendix V where 18 methods are briefly described), the foregoing "adjusted-discounted cash flow valuation method" and the "market capitalization of companies owning interests in comparable properties" were considered to be the most appropriate for valuing the Sherwood Gold Mine Property. If there were a truly comparable property that had been bought or sold close to November 25, 1988, or was owned by a publicly-listed company with no other significant assets or liabilities, then the adjusted discounted cash flow method of valuation would not have been required. However, it is my experience that there are not any truly comparables (although there are similar properties). In addition, properties are usually not bought and sold outright for cash;

* "proven and probable reserves" is a combined category; however, most of the reserves in this category would be classed as "probable"

but, instead, a portion of the property is optioned to an optionor who agrees to make exploration expenditures and cash payments to earn an interest.

The key factors in any adjusted discounted cash flow valuation approach are the existing ore reserves, the expected ore reserves based on geological extrapolation or interpolation, the probability of discovering the expected reserves, metal prices, capital and operating costs, metallurgical recovery, income and mining taxes, and the discount rate. All of these factors are addressed in this report, and the most appropriate assumptions were made based on the available evidence, prior experience at other gold mines, and the experience and expertise of the valuator. Some of the assumptions were then altered in order to determine the sensitivity of the fair market value to those changes. The major assumptions of the base case (expected numbers) are provided below, followed by a summary of the resulting net present values.

Gold price:	Canadian $504.00 per ounce
Silver price:	Canadian $7.30 per ounce
Capital Cost:	Canadian $20.0 million
Operating Cost:	Canadian $125.00 per tonne
Metallurgical Recovery:	90%
Production Start-up:	3½ years from November 25, 1988
Income and Mining Taxes:	Those in effect on November 25, 1988
Discount Rate:	After-tax constant-dollar rate of 5%
Ore Grade:	0.98 ounces of gold per tonne
	1.59 ounces of silver per tonne

For purposes of the adjusted discounted cash flow analyses, Glanville prepared two cash flows. The first was at 200 tonnes per day (70,000 tonnes per year) for three years, while the second was at 200 tonnes per day for six years. Based on expected probabilities of achieving the foregoing reserves, the net present value calculated for the three-year mine life was discounted by 50%, while the incremental net present value (the net present value for the six-year life minus the net present value

for the three-year life) was discounted by 75%. The results of the cash flow analyses are presented below:

Net Present Value for 6-year Mine Life	=	$ 43,606,000
Net Present Value for 3-year Mine Life	=	19,565,000
Incremental Net Present Value	=	$ 24,041,000
Expected Values (fair market values)		
3-year Mine Life Value of $19,565,000 x 50%	=	$ 9,782,000
Incremental Value of $24,041,000 x 25%	=	6,010,000
Total Expected Value (fair market value)	=	$ 15,792,000

As can be seen from the above, the total expected value is approximately $15.8 million. It is Glanville's opinion that the foregoing cash flows incorporate the most realistic assumptions and therefore the resulting expected value represents the fair market value of the Sherwood Gold Mine Property. However, the analyses on page 45 show a range of expected values from $8.7 million to $29.4 million. The $8.7 million value results from incorporating the dilution assumptions utilized by Mr. Barr, while the $29.4 million value results from incorporating the dilution assumptions utilized by Dr. Carter and Mr. T. Heard. All other assumptions, except the grades calculated from utilizing the foregoing different dilution assumptions, were those provided by Glanville (see page 2).

The foregoing range of expected values should not be misinterpreted as providing sensitivity analyses. It is merely the result of calculating values utilizing assumptions of others (Barr and Carter/Heard) regarding dilution. Glanville's assumptions as to dilution (see pages 15 and 16) are different from those of Barr and Carter/Heard. As a result, the actual sensitivities to changes in input assumptions (metal prices or grades, capital costs, and operating costs) from those of Glanville's "Base Case" are shown on page 46.

Glanville has also analyzed comparable gold mining properties located in British Columbia. The market capitalizations (share prices multiplied by the number of shares issued) of the companies that owned these properties prior to November 25, 1988 were utilized to determine the values attributed to the properties by the market. In spite of the fact that some of the comparable deposits were not in production as at November 25, 1988, and

others had closed down not long after the commencement of production, all of the properties were accorded very substantial values (several tens of millions of dollars) by the market because of the expectation of the discovery of additional ore reserves. Subsequent actual results for the various gold properties, however, may be quite different from the expectations. In some cases, much more ore than expected will be discovered (such as at the Erickson Mine* where production commenced with reserves of only 10,000 tons, and ultimate production was almost 600,000 tons). In other cases, less ore will be discovered than originally expected. In all cases, however, the general market (the "collective wisdom" of all of the buyers and sellers in the market) makes a judgment of the future potential based partly on existing reserves and partly on expected reserves, utilizing the experience of other comparable mining properties.

As can be seen from pages 53 to 63, many of the companies owning the comparable gold properties prior to November 25, 1988 had market capitalizations (based on the average of the high and low share trading prices for the years, and adjusted for the ownership interests in the properties) in a particular year of over $50 million in 1988 dollars. Erickson Gold Mines (or the predecessor company), for example, had a market capitalization of about $65 million in 1978, the start-up year when reserves were only 10,000 tons. Obviously, the market was expecting the discovery of many multiples of the reserves indicated at the commencement of production.

The calculated fair market value of the Sherwood Gold Mine Property of $15.8 million appears to be relatively conservative in relation to the values attributed to the comparable properties by the market capitalizations of the companies owning all or a portion of these properties. Nevertheless, it is Glanville's opinion that the calculated $15.8 million value is fair and reasonable as at November 25, 1988. However, it should be noted that the calculated $15.8 million was determined after income and mining taxes. Consequently, if a cash payment made to the owners of the Sherwood Mine Property is taxable (both federally and provincially), it would have to be higher than $15.8 million in order to provide a net return of $15.8 million in 1988 dollars.

* See Page 53

INTRODUCTION AND TERMS OF REFERENCE

Ross Glanville & Associates Ltd. (Glanville) was commissioned by S.C.M. Services Ltd. to determine the fair market value of the Sherwood Gold Mine Property as at November 25, 1988. To accomplish this assignment, Glanville reviewed a variety of reports, documents, and data sources, including those set out below. He also estimated capital and operating costs for a mining operation of 200 tonnes per day based on previous experience and costs of comparable operations. Projections of expected reserves in addition to the proven and probable reserves were based on the extensive known vein system on the property, the experience at other underground gold mining operations, and the judgment of Glanville based on the data available..

Reports / Documents / Data Sources

1. Evaluation Report on the Sherwood Gold Mine Area, Alberni Mining Division, Vancouver Island, B.C., by R.T. Heard, P.Eng., Dr. Carter, Ph.D., P.Eng., G.W. Heard, B.Sc., M.B.A., Vancouver, B.C., November 1989.

2. Report for Ministry of Attorney General, Province of B.C., on Sherwood Mines Limited's Sherwood Gold Mine Property, prepared by D.A. Barr, P.Eng., Vancouver, B.C., October 17, 1990.

3. Report on the Sherwood Mining Claims by Wright Engineers Limited, Vancouver, October 17, 1990.

4. Sherwood Gold Mine, Proposed Exploration and Engineering Program and Budget, prepared by Wright Engineers Limited for Casamiro Resources Corporation, June 28, 1988.

5. Evaluation Report on the Sherwood Gold Mine Area, Alberni Mining Division, for Casamiro Resource Corporation, by R.T. Heard, P.Eng., Vancouver, B.C., December 1986.

6. Report on Underground Rock Sampling, Sherwood Mine, Vancouver Island, for Casamiro Resources Corporation, by Access Geological Services, November 7, 1986.

7. Report on Cangold Mining and Exploration Co. Ltd., by Ernst Henderson and Company, November 15, 1947.

8. Consulting Engineer's Report to Cangold Mines Limited, from B.W.W. McDougall, March 5, 1946.

9. Report on Sherwod Group of Mineral Claims, Alberni Mining Division, Vancouver Island, by B.W.W. McDougall, Consulting Mining Engineer, October 26, 1944.

10. Supplementary Report on Bedwell River Area, Vancouver Island, B.C., by H. Sargent, 1941.

11. Discount Rate for Gold Properties (see Appendix VII).

12. Canadian Producers of Precious Metals, by Ray Goldie of Richardson Greenshields of Canada Limited, September 1982 (see Appendix II).

13. Reserve History of a Selected Group of Canadian Gold Mines, by Wright Engineers Limited, September 1983 (see Appendix III).

14. The Valuation of Mining Properties, presented by Ross Glanville to the Mining Law Seminar, Hyatt Regency, Vancouver, April 7, 1989 (Appendix IV).

15. Evaluation of Mineral Exploration Properties, presented by Ross Glanville at the Northwest Mining Convention, Spokane, Washington, December 6, 1990 (see Appendix V).

16. Economics of Porphyry Copper-Gold Deposits, presented by Ross Glanville to the Mineral Deposits Division of the Geological Association of Canada, Hotel Georgia, Vancouver, April 5, 1989 (see Appendix VI).

17. Valuation of a Gold Mine, presented by Robert Mouat of Wright Engineers Limited, to the District Six Meeting of the Canadian Institute of Mining and Metallurgy, Vancouver Branch, Hotel Vancouver, October 30, 1987 (see Appendix VIII).

18. Various Sensitivity Analysis Reports on the Sherwood Gold Mine Property by George Heard, prepared in 1990.

19. Canadian Mining Taxation, by Price Waterhouse, September, 1988.

20. Canadian Mines Handbooks (1977 to 1989).

21. Annual Reports of Gold Mining Companies with Comparable Properties in British Columbia.

22. Other articles on gold mines in British Columbia.

Since the geology, exploration and mining history, and other aspects of the property are dealt with in detail in several of the foregoing reports, I have not reproduced that information in this valuation report. A field examination of the Sherwood Gold Mine Property was not made at this time because access to the property was not permitted by the Government of British Columbia. However, I did discuss the property with Mr. R.T. Heard, P.Eng., and Mr. Dr. Carter, Ph.D., P.Eng., both of whom have visited the property. In addition, Mr. Heard prepared a report on the property in 1986.

The attached report has been prepared for S.C.M. Services Ltd., and is based partly on information provided to Glanville and partly on Glanville's experience in valuing comparable properties. While care has been taken with the compilation of this report, Ross Glanville & Associates Ltd. hereby disclaims any and all liability arising out of its use or circulation. Although it is believed that the information contained herein is reliable under the conditions and subject to the limitations contained herein, Ross Glanville & Associates Ltd. has assumed the accuracy of the information necessarily relied upon for the preparation of this report, and therefore the use of this report or any part thereof shall be at the user's risk.

VALUATION METHODOLOGIES

Although a great many methods have been utilized in the past to value mining properties (see Appendix V where 18 methods are briefly described), most of the methods are not useful for valuing the Sherwood Gold Mine Property. The most appropriate valuation methods in this case are the "adjusted discounted cash flow method" and the "market capitalization of companies owning interests in comparable properties". These methods are described after the following brief summary of the discounted cash flow method.

The discounted cash flow (DCF) method is the most commonly used, and most widely accepted, method of valuing mining operations. In addition, it is the usual method for valuing mineral properties that have been advanced to the stage at which a feasibility study could commence.

Mines and mineral properties are usually exchanged at a purchase price which reflects the results of the DCF method of establishing value. This method is also utilized by mining companies to determine if mineral properties should be placed into production. In addition, other financial organizations such as banks and investment dealers use the DCF method as part of their financial analyses.

The discounted cash flow method gives recognition to all cash inflows (revenues) and outflows (or expenses) such as operating costs, capital costs, and income taxes. It also takes into account risk, inflation, and the cost of money (interest). The discounted cash flow method is forward looking (that is, past expenditures are irrelevant) and is general in application.

For properties that are not yet at the feasibility stage, or where additional reserves are projected, one can use a combination of the discounted cash flow method and a probability application (the adjusted discounted cash flow method). This probability is based on a judgment of

the likelihood and timing of achieving the projected reserves and proceeding to profitable production.

In addition to the foregoing valuation methods, one can also get an indication of values by looking at the values of comparable properties, with appropriate adjustments for various differences. The market capitalization of a public company whose major interest is the property (or a portion of the property) can be used as a guide to value. If there are other significant net assets or liabilities (such as working capital, debt, and other substantial exploration properties, etc.) one should make adjustments for these. However, for most of the companies analyzed, the net assets, other than the main property, are not significant. Consequently, the market capitalizations can be used as indicators of value, or "tests of reasonableness" of the value determined by the adjusted discounted cash flow valuation method.

It should be emphasized that one cannot value a mining property as one would value real estate. With real estate, unlike with mining properties, the quantity and quality of the items to be valued (land and/or buildings) are known, and the values attributed are usually within a "reasonably narrow range". Such is the case with real estate because there are usually several reasonably straight forward valuation methods such as comparables*, discounted cash flows for revenue properties, replacement cost (maybe less depreciation), etc. With mining properties, on the other hand, both the quantity and quality (tons and grade of reserves) are only partially determined at a particular point in time. Thus, a valuator must make reasonable judgments as to expected tons and grade of reserves based on available data on the property, results at other "comparable" mining properties, and the experience and expertise of the valuator.

* Although there are similar mining properties, there are no truly comparable mining properties.

ORE RESERVES

In any valuation of a gold mining property at the stage of the Sherwood Mine Property, it is important to understand the known ore reserves to obtain an indication of the tenor of the grades. However, it is even more important to make estimations or projections of expected ore reserves based on known information and experience at other mining properties. Such projections are a normal, prudent, and reasonable method of quantifying the expectations of geologists, mining engineers, and mining analysts. These projections, along with estimates of the probability of achieving the various projected ore reserve targets, are then utilized by the valuator to arrive at expected net present values. This process is commonplace, and is carried out by exploration groups, mining companies, mining analysts, and mine valuators. Although there may be differences in opinions as to the precise probabilities of achieving various reserve targets, there can be no doubt that this valuation process is utilized both explicitly (by stating projections of ore reserves combined with probabilities of achieving the projections) and implicitly (the market values of companies with exploration potential are often many multiples of the values derived from only the proven and probable reserves). Appendix II, for example, shows the "Most Likely Reserves" (as projected by Mr. Ray Goldie, mining analyst with Richardson Greenshields of Canada Limited) versus the stated reserves. For underground gold mining properties the ratio of "most likely reserves" to "stated reserves" can be many multiples. This is borne out in Appendix III, which was prepared by Wright Engineers in 1983. That Appendix shows that the actual mine lives (based on what was produced plus the remaining reserves) were many times the stated mine lives at the start of production. This result is because it is very costly to "prove up" reserves to such an extent that they would classify as proven, probable and possible. It is generally more realistic to start production with a smaller amount of reserves and add to reserves with on-going development as production continues. Appendix IV states that possible and inferred reserves do have substantial value, and examples are provided. Appendix VIII, prepared by Wright Engineers in 1987, confirms this (see page 6 of Appendix VIII). Appendix V also provides an example of the application of the adjusted

discounted cash flow method. Appendix VI provides calculations of the value of a gold/copper prospect and also describes other methods of valuing gold projects.

It must be emphasized that a policy such as National Policy No. 2-A has no place in valuations. National Policy 2-A is entitled "Guide for Engineers, Geologists and Prospectors Submitting Reports on Mining Properties to Canadian Provincial Securities Administrators". That policy states that "possible or inferred reserves must not be added to other categories of reserves and their inclusion is not acceptable in any economic analysis or feasibility study of a project". As stated in Appendix IV, valuations are quite different from reports of engineers, geologists and prospectors. In addition, a valuation is not the same as an economic analysis or feasibility study. A property may not have had a feasibility commenced on it, but it can be worth tens of millions of dollars in some cases where initial results are very encouraging.

If one were to state that National Policy 2-A applied to valuations one would have to conclude that all exploration is of no value since that policy only allows the inclusion of proven and probable reserves. This conclusion would be inevitable because there are no proven and probable reserves on any property until sufficient drilling or underground development has been carried out to establish proven and probable reserves. Any statement that National Policy 2-A is applicable to valuations of properties is contrary to common sense because exploration properties do have value. In fact there is a market for these properties, one indication of which is the value of the companies that own these properties (see pages 53 to 62). Advanced properties such as the Sherwood Gold Mine Property have very substantial value due to both the existing proven and probable reserves* as well as the expected additional reserves to be developed with additional exploration and development. The existing reserves of the Sherwood Mine are important to the extent that they indicate the tenor of the grade and tonnage in a very small area that has been explored to date. However, the expected ultimate reserves are just as important to any valuation. As can be determined from the section on

* "proven and probable reserves" is a combined category; however, most of the reserves in this category would be classed as "probable"

"Expected Ore Reserves", there are good geological reasons to expect that the ultimate ore reserves will be many multiples of the already established proven and probable reserves. Most of the exploration reports strongly support that expectation. Even the June 1988 report of Wright Engineers Limited sets out an exploration program of $2.3 million (1988 dollars) over two seasons. Presumably, one would not even consider spending that amount of money unless one felt the value of the exploration potential would be much greater than the expenditures. Consequently, it is my opinion that it is misleading for Wright Engineers Limited in October 1990 to arrive at a value close to zero ($10,000) by selectively choosing unrealistic comparisons and specific assumptions which are inconsistent with those in other reports that they have prepared.

EXISTING ORE RESERVES

This section on Existing Ore Reserves includes the following:

(i) page 12: discussion of choices of major assumptions to be made;
(ii) pages 14 to 17: assumptions utilized by Glanville for the Base Cases (Case A in subsequent cash flows);
(iii) pages 18 to 22: Glanville's calculations of grades by level;
(iv) pages 22 and 23: summary of calculated grades by level with;
  (a) dilution to 1.2 metres (mining width) at 1/4 of the sampled grades (Glanville's assumption);
  (b) dilution at zero grade (Barr's assumption);
  (c) dilution at average of sampled grades (Heard/Carter assumption);
(v) page 23: tonnage calculations;
(vi) pages 24 and 25: tonnage and grade calculations;
(vii) page 26: summary of grades of reserves based on the three different dilution assumptions.

Since Glanville had the benefit of reviewing both Mr. Barr's and Dr. Carter's/Mr. Heard's reports, he has noted where he has utilized different assumptions in his Base Case (Case A) cash flows.

Discussion

The calculations of the existing ore reserves depend on a variety of important assumptions as follows:

1. Sources of sampling data:
   (i) H. Sargent (1941)
   (ii) Casamiro Resource Corporation (1982)
   (iii) R.T. Heard (1986)
   (iv) stated mine production (without back-up calculations)
   (v) stated numbers by a mining company (without back-up calculations)

2. Dilution to mining widths at:
   (i) same grade as sample width
   (ii) at zero grade
   (iii) at a grade more than zero, but only at a fraction of the grade determined over the sample width

3. Tonnage factor per cubic meter

4. The dimensions of the orebody:
   (i) based only on results of level No. 1 and level No. 2
   (ii) based on above results extended to level No. 7
   (iii) based on results of level No. 1, level No. 2 and sample points on level No. 5

Based on one's choice of assumptions from the above list of options, one could arrive at a very optimistic or very pessimistic reserve picture. However, for purposes of valuation, one should attempt to arrive at the most likely, or expected, options from the foregoing alternatives. In order to arrive at the expected numbers, one must apply some judgment based on the data available and past experience. I will now address the various options, and the reasons for making each of the assumptions that were utilized as inputs to the determination of the existing ore reserves.

1. Sources of Sampling Data:

Level No. 1

It appears that the sources of data for Level No. 1 include the actual data for the seven samples taken by H. Sargent in 1941, as well as statements of overall grades, widths and lengths. Since these latter statements include no mention of how the reserves were calculated (or if any cutting of grades was carried out, or if the sampling was across the full width of the ore zone), Glanville utilized the actual sampling data of Sargent. Based on Mr. Barr's calculation of 0.96 ounces per ton over 1 meter, I believe he relied solely on a statement which Mr. B.W.W. McDougall (October 1944) attributed to a "report for the fiscal year ending March 1941, of Pioneer Gold Mines Ltd." That report simply states average gold grades over an average width and length for Levels 1 and 3. Thus, it appears that Mr. Barr has not calculated grades himself, but simply accepted the statements in the Pioneer annual report.

Level No. 3

Level No. 3 was sampled by H. Sargent, R.T. Heard and Casamiro Resource Corporation, for a total of 22 samples. The weighted average grade was calculated by Glanville based on weighting the assay results for each of the three samplers.

Based on Mr. Barr's calculation of 0.518 ounces per ton over 1 meter, I believe he relied solely on a statement which was attributed to Pioneer Gold Mines in their March 1941 report.

Level No. 5

Level No. 5 has two sampling points with very high assays. These include 22 tons reportedly mined by W.J. Sherwood, with assays of 3.25 ounces of gold per ton and 5.75 ounces of silver per ton, and a reported grab sample by W.J. Sherwood averaging 27.2 ounces of gold per ton. McDougall (1944) states that "commercial values are said to obtain in this sub-level (Level No. 5)".

Although one should not rely on this data (in the same way that I would not rely solely on a statement of grade and width that was stated in a 1941 annual report) because we don't have enough data about the type of sample (including the length and width, or cutting of grade, if any), the high grades certainly are encouraging.

For purposes of this valuation report, Glanville ignored the high values (a very conservative assumption) and simply took the average of the results for Level No. 1 and Level No. 3 (resulting in a grade of 0.97 ounces of gold per tonne) for Level No. 5. However, the calculations of proven and probable ore reserves only included ore to a level mid-way between Level No. 3 and Level No. 5.

2. Dilution to Mining Widths

Mr. Barr diluted all of the reserves he used (those attributed to a statement in the 1941 report of Pioneer Gold Mines Ltd.) out to one meter at zero grade. Mr. Heard and Dr. Carter diluted the reserves out to one meter at the same grade as over that sampled. Mr. Heard, who has actually taken samples on the property, believes that the stringers from the main sampled area would also carry good grade.

There is considerable support for the premise that there are stringers which would carry gold grade out beyond the width sampled. The following two references are relevant:

H. Sargent, 1941:

"The width (of the shear zone) from 3 to 4 to at least 6 feet (1.83 meters), is rather indefinite, because branch-shears run off into the walls, and the walls and the filling of the shear are greatly altered."

"Narrow veins branch into the walls of the workings."

"Some of the branch-shears, or branch-fractures containing mineralization, follow contacts."

"Over an average width of 39 inches (1 meter) company sampling indicated commercial values in the first 186 feet of this working (Level No. 1)."

B.W.W. McDougall, October 26, 1944:

"Small stringers, some of them minute, branch off at acute angles to fade away into the walls, and the walls themselves are leached to a pale color to a depth of an inch or more due to hydrothermal action. The shear width as disclosed in the workings appears to vary from three to upwards of five feet (1.52 meters) though, presumably, the gold values are contained largely in the quartz and possibly to a lesser extent in the originally-silicified sheared country rock which in places occurs between quartz strands."

Although the foregoing indicates that some grade should be attributed to the zone beyond the sampling width, I believe (although I have not been on the property, and Mr. Heard has) that it should not be at the same grade as that over the width sampled. However, it is my opinion that it would not be reasonable to attribute a zero grade to any extension. For purposes of this valuation report, I assumed the grade of the extension beyond the sampling width (to a mining width of 1.2 meters) to be at one quarter of the sampled grade. However, I also completed net present value calculations based on the extremely conservative assumption of zero grade for the diluted material.

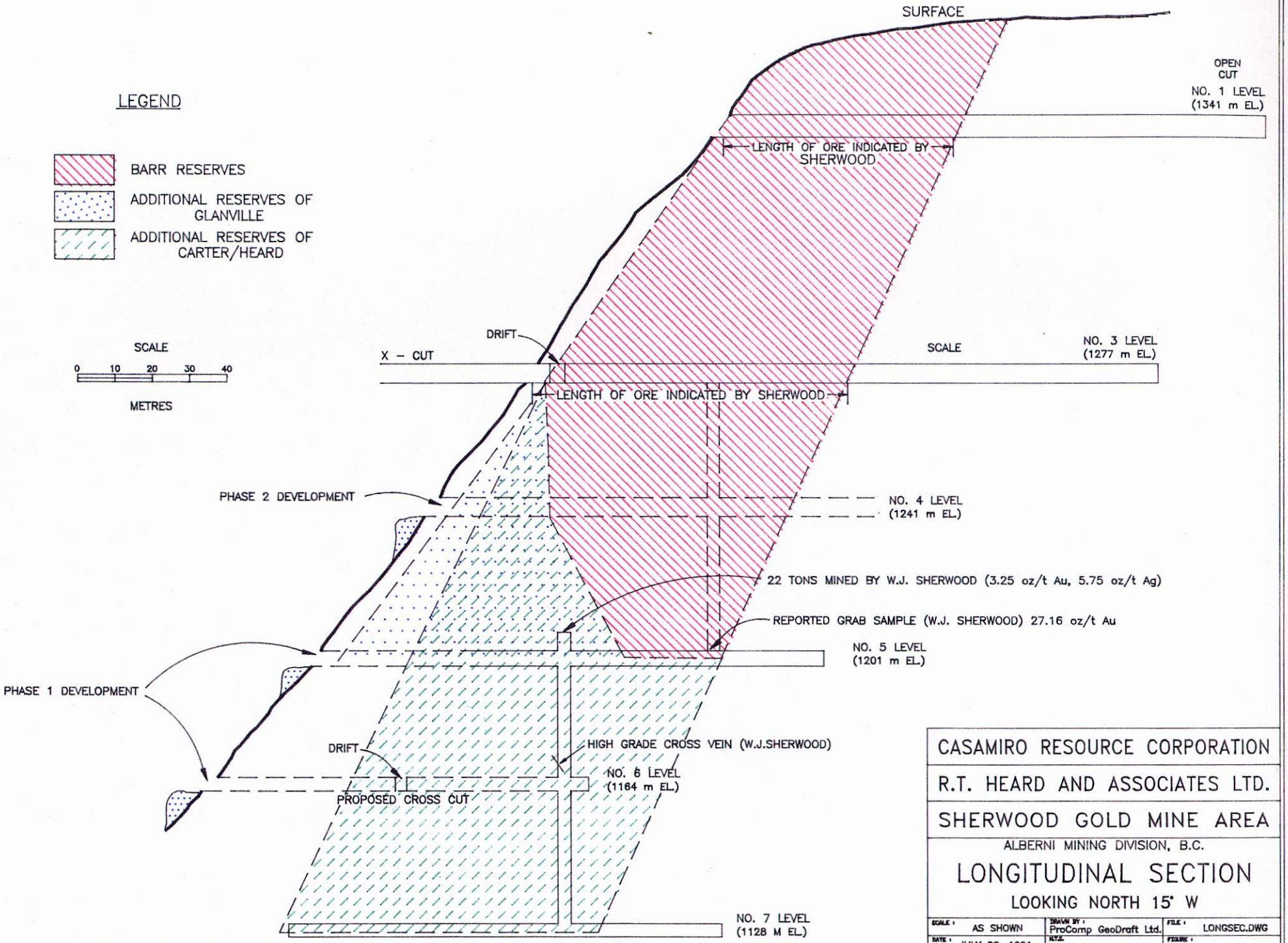
3. Tonnage Factor per Cubic Meter

Based on the tonnages calculated by Mr. Barr, it appears that he has used a factor of 2.7 tonnes per cubic meter, whereas Mr. T. Heard and Dr. Carter have used a factor of 2.8 tonnes per cubic meter because of the descriptions of sulphide content of the vein. Although there is obviously a small difference, it is probably not material at this stage. However, additional work should be done to estimate the tonnage factor. Glanville has utilized a tonnage factor of 2.8 tonnes per cubic meter.

4. The Dimensions of the Orebody

Dr. Carter and Mr. Heard have assumed that the ore zone continues down to the No. 7 Level, while Mr. Barr has assumed a narrow zone from the No. 3 Level only to the No. 5 Level (see attached cross-section). Mr. Heard believes (according to his December 1986 report and recent discussions) that the zone sampled on the No. 7 Level is a separate parallel vein system. He stated in the 1986 report "the vein fault on the No. 7 Level appears to have a different character from that seen in the No. 5 and No. 3 Levels, and may in fact be a separate parallel vein." Mr. Barr has utilized the low values on No. 7 Level to conclude (in October 1990) that the ore zone should not be extended to the No. 7 Level. In addition, he has assumed that the ore in the No. 5 Level extends only 28 meters (the length of ore he says was indicated by Sherwood). Yet the same Sherwood reportedly mined 22 tons grading 3.25 ounces of gold per ton and 5.75 ounces of silver per ton at a point about 15 meters beyond where Mr. Barr has cut off the ore for his calculations.

Glanville has only calculated ore down to the No. 5 Level, with the ore above the "No. 4 Level" classed as proven and probable, and that between the "No. 4 Level" and the No. 5 Level classed as possible. However, Glanville has assumed that the ore in the No. 5 Level extends to include the point where the high grade ore (3.75 ounces of gold per ton) was mined. However, he used only a fraction of the grades indicated by the samples in Level No. 5.



CASAMIRO RESOURCE CORPORATION

R.T. HEARD AND ASSOCIATES LTD.

SHERWOOD GOLD MINE AREA

ALBERNI MINING DIVISION, B.C.

LONGITUDINAL SECTION

LOOKING NORTH 15° W

SCALE : AS SHOWN	DRAWN BY : ProComp GeoDraft Ltd.	FILE : LONGSEC.DWG
DATE : JULY 22, 1991	N.T.S.	FIGURE :

Calculations

The calculations of grades by level, average grades of various ore zones, the tonnage applicable to each zone, total proven and possible reserves, and possible reserves are calculated in the following pages.

Grade Calculations

The grades were first calculated over the actual width sampled and then grades were calculated over a mining width of 1.2 meters, assuming the diluted grade at one quarter of the sampled grade. Following those calculations, Glanville made two other calculations for purposes of sensitivity analyses. The first included dilution at the average grade to 1.0 meters (and zero grade from 1.0 to 1.2 meters), while the second included dilution to 1.2 meters of zero grade.

Level No. 1

The following samples were taken by Sargent:

	Width		Au		Au x Width	Ag	Ag x Width
1.	26"	x	.90	=	23.40	1.10	28.60
2.	43"	x	1.02	=	43.86	3.20	137.60
3.	28"	x	1.17	=	32.76	4.20	117.60
4.	26"	x	1.47	=	38.22	8.30	215.80
5.	19"	x	5.97	=	113.43	0.50	9.50
6.	22"	x	4.58	=	100.76	0.70	15.40
7.	9"	x	0.34	=	3.06	0.50	4.50
	173"	X		=	355.49	Y	529.00

X = 2.05 opt
X = 2.27 ounces/tonne
X = 70.45 grams/tonne

Y = 3.06 opt
Y = 3.37 ounces/tonne
Y = 104.82 grams/tonne

Average Width Sampled = 24.71" = 2.06 feet
= 0.63 meters

Grades diluted to 1.2 meters at one quarter the average grade:

Gold:	0.63 meters x 2.27 ounces/tonne	=	1.4301	
	0.57 meters x 0.57 ounces/tonne	=	.3249	
	(1.20 - 0.60)		1.7550	
	Average grade over 1.2 metres	=	1.46	ounces/tonne Au
Silver:	0.63 meters x 3.37 ounces/tonne	=	2.1231	
	0.57 meters x 0.84 ounces/tonne	=	0.4959	
			2.6190	
	Average grade over 1.2 meters	=	2.18	ounces/tonne Ag

Level No. 3

The following samples were taken by Sargent:

	Width		Au		Au x Width	Ag	Ag x Width
8.	14"	x	0.60	=	8.40	2.1	29.4
9.	9"	x	4.00	=	36.00	5.0	45.0
10.	11"	x	1.10	=	12.10	2.3	25.3
11.	15"	x	0.28	=	4.20	1.3	19.5
12.	21"	x	0.02	=	0.42	0	0
13.	17"	x	0.50	=	8.50	1.1	18.7
14.	21"	x	1.46	=	30.66	3.6	75.6
15.	19"	x	0.32	=	6.08	3.6	68.4
16.	12"	x	0.30	=	3.60	0.3	3.6
17.	24"	x	3.40	=	81.60	4.0	96.0
	163"	x	X	=	191.56	Y	381.5

X	=	1.18 ounces/ton Au	Y	=	2.34 ounces/ton Ag
X	=	1.29 ounces/tonne Au	Y	=	2.58 ounces/tonne Ag
X	=	40.3 grams/tonne Au	Y	=	80.2 grams/tonne Ag

Average width of 10 samples = 16.3 inches = 0.41 meters

The following were taken by Heard:

	Width	Au	Ag	Au x Width	Ag x Width
12.	0.8'	3.121	3.77	24.97	30.16
13.	0.9'	1.418	2.59	12.76	23.31
14.	1.4'	1.357	2.19	19.00	30.06
15.	1.8'	0.306	1.95	5.51	35.10
16.	1.0'	0.025	0.13	.25	1.30
	5.9'			62.47	119.93

Average = 1.06 ounces/ton Au
= 1.17 ounces/tonne Au
= 36.3 grams/tonne Au

Average = 2.03 ounces/ton Ag
= 2.24 ounces/tonne Ag
= 69.7 grams/tonne Ag

Average width of 1.18 feet = 14.2 inches = .36 meters

The following samples were taken by Casamiro personnel:

	Au	Ag
H	.335	1.13
I	.790	1.09
J	1.830	3.45
K	0.840	0.26
L	0.089	0.36
P	1.260	0.96
2-B	5.700	10.10

	Au	Ag
Average =	1.55 opt	2.48 opt
Average =	1.71 ounces/tonne	2.73 ounces/tonne
Average =	53.2 grams/tonne	85.0 grams/tonne

Assume average width of 15 inches
(note Heard = 14.2", Sargent = 16.3") = 0.38 meters

The average of the previous three groups of samples is as follows:

Gold:

Sargent	:	1.29	ounces/tonne over	0.41	meters	=	0.5289
Heard	:	1.17	ounces/tonne over	0.36	meters	=	0.4212
Casamiro	:	1.71	ounces/tonne over	0.38	meters	=	0.6498
		1.39		1.15			1.5999

Average Gold Grade = 1.39 ounces/tonne over 0.38 meters

Diluted to 1.2 meters:

0.38	meters at 1.39 ounces/tonne	=	0.5282
0.82	meters at 0.35 ounces/tonne	=	0.2870
1.20	meters at 0.68 ounces/tonne	=	0.8152

Average Gold Grade = 0.68 ounces/tonne over 1.20 meters

Silver:

Sargent	:	2.58	ounces/tonne over	0.41	meters	=	1.0578
Heard	:	2.24	ounces/tonne over	0.36	meters	=	0.8064
Casamiro	:	2.73	ounces/tonne over	0.38	meters	=	1.0374
		2.52		1.15			2.9016

Average Silver Grade = 2.52 ounces/tonne over 0.38 meters

Diluted to 1.2 meters:

0.38	meters x 2.52 ounces/tonne	=	.9576
0.82	meters x 0.63 ounces/tonne	=	.5166
1.20	meters x 1.23 ounces/tonne		1.4742

Average Silver Grade = 1.23 ounces/tonne over 1.20 meters

Level No. 5

1. 22 tons reportedly mined by W.J. Sherwood assaying 3.58 ounces of gold per tonne (3.25 ounces per ton) and 6.34 ounces of silver per tonne (5.75 ounces per ton).

2. Reported grab samples by W.J. Sherwood assaying 29.9 ounces of gold per tonne (27.2 ounces per ton).

Although there is not enough information on the sampling points on the No. 5 level, there were obviously some very high assays of gold and silver on that level. If one ignores these high grades and only assumes the average of the grades on the No. 1 and No. 3 Level for the No. 5 Level, the grades would be 1.07 ounces of gold per tonne and 1.71 ounces of silver per tonne. However, the tonnage from Level No. 5 up to one half of the way to Level No. 3 could not be classed as proven or probable ore.

Summary of Grades by Level

Level #1

Grade if diluted to 1.2 meters at 1/4 the grade	=	1.46 ounces/tonne Au
	=	2.18 ounces/tonne Ag
Grade if diluted to 1.0 meters at the average	=	1.89 ounces/tonne Au
grade and from 1.0 to 1.2 meters at zero grade	=	2.81 ounces/tonne Ag
Grade if diluted to 1.2 meters at zero grade	=	1.19 ounces/tonne Au
	=	1.77 ounces/tonne Ag

Level #3

Grade if diluted to 1.2 meters at 1/4 the grade	=	0.68 ounces/tonne Au
	=	1.23 ounces/tonne Ag
Grade if diluted to 1.0 meters at the average	=	1.16 ounces/tonne Au
grade and from 1.0 to 1.2 meters at zero grade	=	2.10 ounces/tonne Ag
Grade if diluted to 1.2 meters at zero grade	=	0.44 ounces/tonne Au
	=	0.80 ounces/tonne Ag

Level #5

Grade if diluted to 1.2 meters at 1/4 the grade = 1.07 ounces/tonne Au
= 1.71 ounces/tonne Ag

Grade if diluted to 1.0 meters at the average grade and from 1.0 to 1.2 meters at zero grade = 1.52 ounces/tonne Au
= 2.45 ounces/tonne Ag

Grade if diluted to 1.2 meters at zero grade = 0.82 ounces/tonne Au
= 1.29 ounces/tonne Ag

Tonnage Calculations (assuming 1.2 meter mining widths and 2.8 tonnes/m^3)

Above No. 1 Level:

56.4 meters (185 feet) x 25 meters x 1.2 meters x 2.8 = 4,738 tonnes

Below No. 1 Level (one half way to No. 3 Level)

$$\frac{(56.4 + 77.4)}{2} = \frac{66.9 \text{ meters} + 56.4}{2} \times \frac{(1341-1277)}{2} \times 1.2 \times 2.8$$

= 6,629 tonnes

Above No. 3 Level (one half way to No. 1 Level)

$$\frac{(77.4 + 66.9)}{2} \times 32 \text{ meters} \times 1.2 \times 2.8 = 7,758 \text{ tonnes}$$

Below No. 3 Level (one half way to No. 5 Level)

$$\frac{(77.4 + 89.8)}{2} \times 32 \text{ meters} \times 1.2 \times 2.8 = 10,674 \text{ tonnes}$$

Above No. 5 Level (one half way to No. 3 Level)

$$\frac{(89.8 + 102.3)}{2} \times 38 \text{ meters} \times 1.2 \times 2.8 = 12,264 \text{ tonnes}$$

Tonnage and Grade Calculations

Proven and probable ore (assuming dilution to 1.2 meters at one quarter of the grade of the sampled width):

4,738	tonnes	
6,629	tonnes	
11,367	tonnes grading:	1.46 ounces of gold per tonne 2.18 ounces of silver per tonne
7,758	tonnes	
10,674	tonnes	
18,432	tonnes grading:	0.68 ounces of gold per tonne 1.23 ounces of silver per tonne

Total 29,799 tonnes grading as follows:

Gold					Silver			
11,367	x	1.46	=	16,596	x	2.18	=	24,780
18,432	x	0.68	=	12,534	x	1.23	=	22,671
29,799	x	0.98	=	29,130	x	1.59	=	47,451

Average gold grade = 0.98 ounces/tonne
Average silver grade = 1.59 ounces/tonne

(The foregoing equates to 32,848 tons grading 0.89 ounces of gold per ton and 1.44 ounces of silver per ton.)

Possible Ore (assuming dilution to 1.2 meters at one quarter of the grade of the sampled width)

12,264	tonnes grading:	1.07 ounces of gold per tonne 1.71 ounces of silver per tonne

(The foregoing equates to 13,519 tons grading 0.97 ounces of gold per ton and 1.55 ounces of silver per ton.)

Proven, Probable and Possible Ore (assuming dilution to 1.2 meters at a grade one quarter of that of the sampled width)

Gold:	29,799	at 0.98 ounces/tonne gold	= 29,203
	12,264	at 1.07 ounces/tonne gold	= 13,122
	42,063	at 1.01 ounces/tonne gold	= 42,325

Average gold grade = 1.01 ounces/tonne

Silver:	29,799	x	1.59	=	47,380
	12,264	x	1.71	=	20,971
	42,063	x	1.62	=	68,351

Average silver grade = 1.62 ounces/tonne

(The foregoing equates to 46,367 tons grading 0.92 ounces of gold per ton and 1.47 ounces of silver per ton.)

If the foregoing calculations were based on dilution to 1.0 meters at the average grade and from 1.0 to 1.2 meters at zero grade, the grades of the reserves would be as follows:

Proven and probable reserves of:	1.43 ounces of gold per tonne
	2.37 ounces of silver per tonne
If the possible reserves are	1.46 ounces of gold per tonne
included the grades are:	2.39 ounces of silver per tonne

If the foregoing calculations were based on dilution to 1.2 meters at zero grade, the grades of the reserves would be as follows:

Proven and probable reserves of:	0.73 ounces of gold per tonne
	1.17 ounces of silver per tonne
If the possible reserves are	0.76 ounces of gold per tonne
included the grades are:	1.21 ounces of silver per tonne

Summary of Grades of Reserves (in ounces/tonne)

	Diluted to 1.2 meters		
	at average grade to[1] 1.0 meters and then at zero grade from 1.0 to 1.2 meters	at 1/4[2] the Grade	at Zero[3] Grade
Proven and Probable:			
Gold	1.43	0.98	0.73
Silver	2.37 (Case C)	1.59 (Case A) Base Case	1.17 (Case E)
Proven and Probable and Possible:			
Gold	1.46	1.01	0.76
Silver	2.39 (Case D)	1.62 (Case B)	1.21 (Case F)

The various cases (A to F) are referred to in the section which shows the discounted cash flow calculations.

(1) Carter/Heard dilution assumptions to 1.0 meters (and then mining dilution at zero grade from 1.0 to 1.2 meters).

(2) Glanville dilution assumptions to 1.2 meters (mining width).

(3) Barr dilution assumptions to 1.0 meters (and then mining dilution at zero grade from 1.0 to 1.2 meters).

EXPECTED ORE RESERVES

As stated in the introduction to this section on ore reserves, it is critical that a mine valuator make a judgment about the potential ore reserves on a property. This judgment is based on the following:

1. The actual data on the exploration potential of the property as set out in a variety of sources.

2. The experience of other Canadian gold mines with regard to actual reserves mined versus stated reserves at the start of production.

3. The opinions of mine valuators regarding the likelihood of substantial additional reserves.

4. The opinions of other exploration geologists and mining engineers familiar with "comparable properties".

The foregoing will now be addressed in the order that they are listed.

1. Actual Data on Exploration Potential

The following quotes from various reports on the Sherwood Mine potential are relevant:

(i) March 5, 1946, report by B.W.W. McDougall:

> "The Sherwood vein, on which all the underground work effected on the property has been done, and which has been partly developed to a depth of more than 750 feet below the outcrop, is traceable on the surface for a distance of more than 1,500 feet beyond the limits of the present workings, and it is believed that the possibilities for further ore shoots in this large undeveloped vein area are promising. Some 200 feet easterly from the face of the No. 1 level another and intersecting vein has been discovered. The surface trace of this vein can be followed for a distance of more than 2,000 feet on the Patullo Nos. 1 and 4 claims, and it is believed that it persists to the Septimus fault, which is a regional feature of the area and which, for

the most part, lies immediately beyond the northerly limits of the property. Gold assays up to a maximum amount of nearly one ounce to the ton have been returned from near-surface samples. Two other narrow vein fractures, more or less parallel to the first, have also been found, and these, too, show gold-bearing mineralization though very little prospecting work has yet been done on them. On the Patullo No. 2 claim five more vein fractures have been found and from one of these an assay of 1.5 ounces to the ton in gold has been obtained.

Due to the exposed positions of these several vein fractures oxidation has been severe, and this is also the case with the Sherwood vein outcrop. For this reason it is, for the most part, impractical to determine true average values by ordinary pitting and opencutting. The outcrops of the newly-found vein fractures are from about 1,000 to more than 1,500 feet higher than the No. 7 drift adit on the Sherwood vein, and they can be explored to good advantage by extending this working. They are also well situated for exploration by diamond drilling from the surface or from extensions of any of the existing adits.

The claims situated on the northerly side of the valley, being decidedly precipitous in places, are more difficult to explore, though vein occurrences can be developed at great depth by adits from the valley floor. Two or three narrow veins carrying attractive values in gold have been found and, in due course, this area will warrant aggressive exploration attention.

The several discoveries made during the year just concluded thus provide exploration and development objectives of definite promise in territory which is within reasonable reach of the present underground workings and from which such ore bodies as may be found may be mined and milled by means of the same facilities now being planned for exploiting the ore body already developed in the Sherwood vein."

It should be noted that the approximately 40,000 tons of ore already outlined occupies on area with a length averaging about 250 feet and a depth of less than 550 feet. Reviewing the foregoing quotations one can estimate the dimensions of just two of the veins already identified of between 1,500 and 2,000 feet in length and depths to the No. 7 Level of up to 1,500 feet. Although it is unlikely that all of these two veins would consist of economic mineralization, the dimensions result in potential ore zones of a total size of more than 30 times as large as that already identified. However, these are just two of the several veins already identified on the property, and several others are likely to be discovered

with additional work. In addition, we have not even addressed the substantial ore potential below the No. 7 Level.

(ii) October 26, 1944, report by B.W.W. McDougall:

"The matter of establishing a continuing profitable operation lies in the possibility of locating other ore shoots in the Sherwood shear, particularly on the westerly end, and in the possibility of acquiring on suitably favorable terms other near-by properties having gold occurrences of known interest the working of which would require little additional equipment. Considered on this basis and having regard to the fact that gold mines are made rather than found I am of the opinion that the exploitation of the Sherwood property is a promising mining venture."

(iii) Report on Cangold Mining & Exploration Co. Ltd. by Ernst Henderson and Company (Investment Brokers), November 1947:

"Many additional veins had been discovered and our mining engineer had described it as a 'stockwork of cross veins'."

"Every qualified mining man who had examined the property had been impressed with the huge development possibilities."

The attached page from the report of Ernst Henderson and Company gives one an indication of the potential of the Sherwood property.

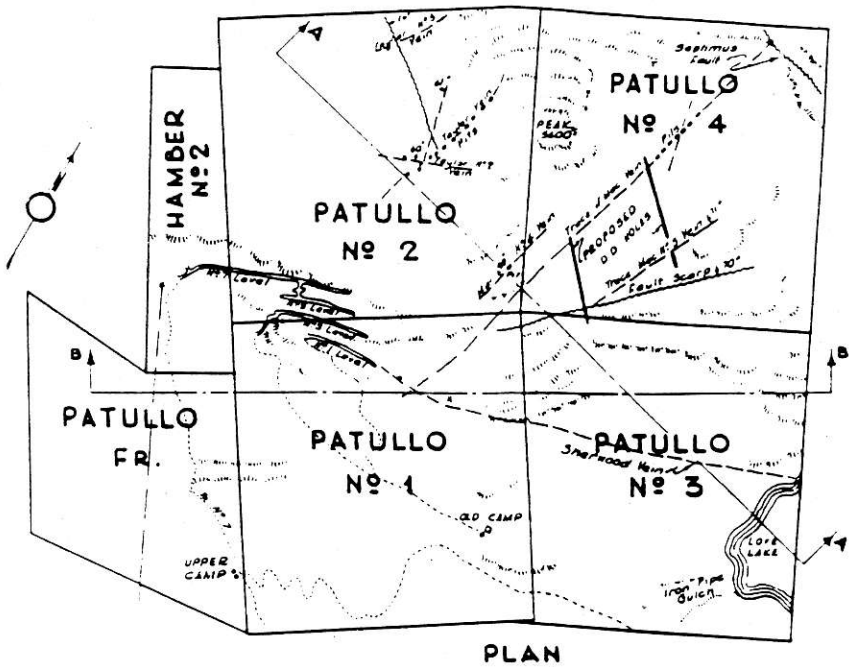
(iv) Report of June, 1988, by Wright Engineers Limited:

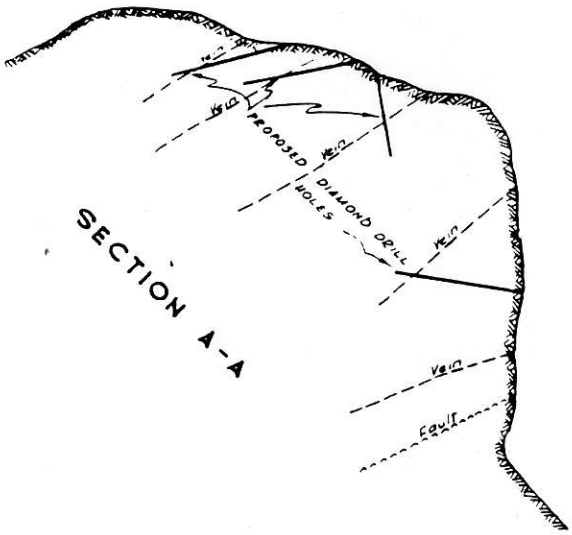
"The intention of this section is to present an exploration program which will prove up published tonnages and locate further reserves on the Sherwood Mine owned by Casamiro Resource Corporation."

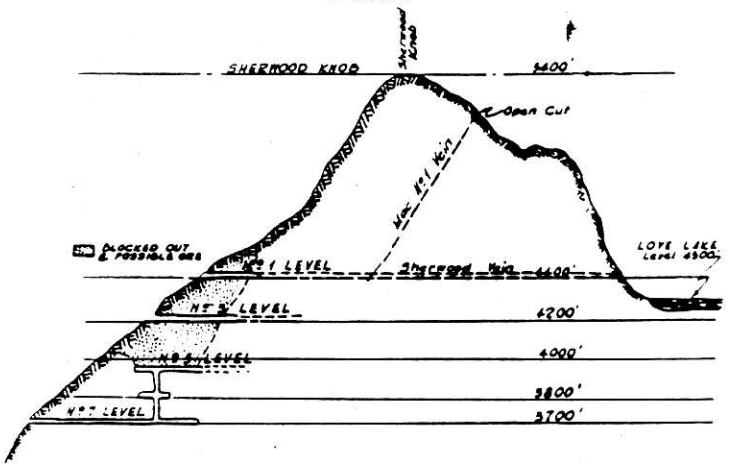
(v) Report of the British Columbia Minister of Mines for 1945:

"Surface prospecting above the present mine-workings found outcrops of several new gold-bearing quartz veins."

The property of Cangold Mining and Exploration Co. Ltd. comprises a total of 28 mineral claims in one group; 8 claims being owned outright by the Company and the balance on long term option. It is located in Drinkwater Valley in Strathcona Park, about 36 miles north-west of Port Alberni on Vancouver Island, British Columbia.







The above sketches may help you to visualize the huge ore development possibilities on Cangold. In the Plan at top are shown the numerous veins which have been discovered and partly explored on the surface. The length, width and assays on these are substantial.

Bear in mind that only about 2000 feet of development work underground has already proven a sizeable tonnage of high-grade ore.

Visualize the potential ore that can be developed above and below the 4000 foot elevation as present workings are extended further into this mountain.

2. The Experience at Other Canadian Gold Mines

As can be seen from the report in Appendix III and page 7 of Appendix VIII, the ratio of "actual production plus remaining reserves" to the "reserves stated at the start of mine production" have often been in the range of 5 to 10. This means that the ultimate reserves are often five to ten times those established at the start of production. As indicated in Appendix III, this occurs because it is very costly to prove up reserves in advance to such an extent that they classify as proven, probable and possible.

It should be noted that Erickson Gold Mines Ltd. started production with only 10,000 tons of ore, and ultimately mined about 580,000 tons before shutting down. The data in Appendix III shows a ratio of ultimate reserves to starting reserves of 22.85 for Erickson. However, the actual ratio is much greater (closer to 60) because the data base for Appendix III only included results to 1982. Actual production to early 1989 was approximately 580,000 tons.

3. The Opinions of Mine Valuators

As can be seen from Appendix II the expected reserves (as per the opinion of a professional mine valuator) are often shown to be several times the stated reserves. This occurs because it is generally too expensive to prove up underground reserves of gold mines for more than a few years. What happens is that one that starts mining and continually develops reserves as mining progresses.

4. The Opinions of Other Exploration Geologists and Mining Engineers

As can be seen from page 46 of the report of Mr. Terry Heard and Dr. Carter, they both believe there is a 50% probability of discovering an additional 250,000 tonnes of ore (for a total of approximately 300,000 tonnes) and a 20% chance of discovering an additional 500,000 tons of ore (for a total of 800,000 tonnes) at Sherwood.

Reserve Estimates

I would agree that there is the potential for at least 800,000 tonnes or more of ore in total, including the existing ore, on the Sherwood Mine Property. However, I have reduced the expected tonnage considerably. It is my opinion that there is at least a 50% chance of finding enough ore to mine for three years at a 200 tonne per day production rate (or 210,000 tonnes in total) on the Sherwood Mine Property and at least a 25% chance of finding double that amount (420,000 tonnes in total). For purposes of the valuation, I have reduced the calculated value for the 210,000 tonne case by 50% and I have reduced the calculated incremental value (value of the 420,000 tonne case minus the value of the 210,000 tonne case) by 75%.

DISCOUNTED CASH FLOW CALCULATIONS

The discounted cash flow method is the method used in this section to establish net present values for the Sherwood Gold Mine. Cash flows have been prepared under six different assumptions as to grade (Cases A, B, C, D, E and F) with the most likely grade being that in Case A (diluted to 1.2 meters at one quarter the grade of the sampled width).

The other assumptions or input parameters are discussed below:

ASSUMPTIONS

1. Metal Prices

Gold Price:	Canadian $504.00 per ounce
Silver Price:	Canadian $7.30 per ounce

The above prices were the spot (then current) prices for gold and silver at the valuation date of November 25, 1988. Although one could have sold gold forward at a price considerably above the spot price shown here, we have utilized the spot prices in the discounted cash flows. This is consistent with the use of a 5% after-tax real (constant-dollar) discount rate of 5% (see discussion of discount rate on page 35).

2. Capital Costs

Although Wright Engineers has shown capital costs of between $20 and $28 million, it is my opinion, based on my own experience and that at other comparable operations, that those costs are much too high for a variety of reasons as follows:

(i) The W.E.L. costs are for a facility which is built to last 10 years (see the W.E.L. cash flow calculations) rather than for a short mine life of 3 to 6 years assumed by Glanville.

(ii) One could use second-hand equipment rather than new equipment to lower the cost of an operation with a short projected mine life.

(iii) There is some development already in place at the Sherwood Mine.

(iv) The $20 to $28 million would be approximately $18 to $25 million dollars in 1988 dollars.

(v) The capital costs of some other comparable operations such as Erickson (see page 53) and Blackdome (see page 55) cost less than $10 million to construct. The 1987-1988 Canadian Mines Handbook states that construction of a 200 tpd mining and milling complex at Blackdome cost $6.8 million (commercial production began in May 1986). The cost to production at Erickson at 100 tpd (according to the 1979-1980 Canadian Mines Handbook) was $1.5 million. Even when the foregoing numbers were adjusted to 1988 dollars, they were still considerably less than $10 million. Even the Mount Skukum Mine (a 200 tpd operation), a gold mining operation which was constructed in the Yukon more recently, cost much less than $10 million.

In spite of the above, I have utilized a total capital cost to the start of production of $20 million in the attached cash flows. I believe that such a figure is conservative, even when one takes into account the likely more stringent requirements imposed because of the location in a park.

3. Operating Costs

Wright Engineers has estimated operating costs of $112 per metric tonne in 1990 dollars, or approximately $103 per metric tonne in 1988 dollars. I have reviewed operating cost data (and feasibility

study data) for other comparable operations, and would generally concur that the Wright Engineers' numbers are appropriate for Sherwood. However, for purposes of this valuation report, I have utilized an operating cost of $125 per tonne (approximatey 20% higher than the W.E.L. estimate).

4. Metallurgical Recovery

Although many gold mining operations recover 95% of the gold, Glanville has utilized a 90% recovery for the purposes of this valuation report.

5. Development Schedule

The exploration and development schedule assumes two and one half years of exploration at a cost of $2.0 million and then one year of construction. As a result, production would commence in the middle of the fourth year.

6. Reserves

For purposes of the base case (Case "A") cash flow analysis, Glanville ran two cash flows. The first was at 70,000 tons per year for three years and the second was at 70,000 tons per year for six years. The resulting "three-year value" was then discounted by 50% and the incremental value (the "six-year value" minus the "three-year value") was discounted by 75% to arrive at a fair market value as at November 25, 1988.

7. Salvage Value

For purposes of the cash flow analysis, no salvage value was assumed at the end of the mine lives.

8. Income and Mining Taxes

Although Wright Engineers has used the income tax and royalty regulations that were in place in October 1990, the new B.C. regulations for taxing mining income did not come into place until January 1, 1990. Consequently, Glanville has utilized the income and mining tax regulations in place as at November 25, 1988. However, there would be very little impact on the value of the change in tax regulations.

9. Discount Rate

A constant-dollar discount rate of 5% (after-tax) has been utilized to discount the cash flows to November 25, 1988. Appendix VIII provides a detailed justification of the use of a 5% (or lower) discount rate. For comparative purposes, it should be noted that a treasury-bill yield of 8.5% is equivalent to a rate of zero percent on a constant-dollar after-tax basis (with a 45% tax rate and an inflation rate of 4.7%) since 55% of 8.5% equals 4.7% before the deduction of 4.7% for inflation (the actual present inflation rate is above 4.7%, so the actual real return is negative).

Although W.E.L. has recommended a 10% rate for discounting the cash flow, actual articles and presentations by W.E.L. personnel would suggest a rate closer to zero for a gold property (see Appendix VIII, page 12).

OPERATIING MARGINS PER TONNE

The operating margins per tonne were calculated under six different grade assumptions as set out below:

Case "A": **(Base Case)** Grade based on proven and probable ore with dilution to 1.2 meters at a grade of one quarter of that over the sampled width (Glanville's assumption).

Case "B": Grade based on proven and probable and possible ore with dilution to 1.2 meters at a grade of one quarter of that over the sampled width (Glanville's assumption).

Case "C": Grade based on proven and probable ore with dilution to 1.0 meters at average grade and from 1.0 to 1.2 meters at zero grade (Carter/Heard assumption).

Case "D": Grade based on proven and probable and possible ore with dilution to 1.0 meters at average grade and from 1.0 to 1.2 meters at zero grade (Carter/Heard assumption).

Case "E": Grade based on proven and probable ore with dilution to 1.2 meters at zero grade (Barr's assumption).

Case "F": Grade based on proven and probable and possible ore with dilution to 1.2 meters at zero grade (Barr's assumption).

Operating Margins Per Tonne

	Case "A"	Case "B"	Case "C"	Case "D"	Case "E"	Case "F"
Gold Grade (ounces/tonne)	0.98	1.01	1.43	1.46	0.73	0.76*
Silver Grade (ounces/tonne)	1.59	1.62	2.37	2.39	1.17	1.21**
Gold Recovery	90%	90%	90%	90%	90%	90%
Silver Recovery	90%	90%	90%	90%	90%	90%
Gold Price (Cdn $/ounce)	$504	$504	$504	$504	$504	$504
Silver Price (Cdn $/ounce)	7.30	7.30	7.30	7.30	7.30	7.30
Gold Revenue/tonne	445	458	649	662	331	345
Silver Revenue/tonne	10	11	15	16	8	8
Total Revenue/tonne	455	469	664	678	339	353
Operating Costs/tonne	125	125	125	125	125	125
Operating Margin/tonne	$330	$344	$539	$553	$214	$228
Tonnes/Year	70,000	70,000	70,000	70,000	70,000	70,000
Operating Margin/Year	$23,100,000	$24,800,000	$37,730,000	$38,710,000	$14,980,000	$15,960,000

* Gold grade equals that calculated by Dave Barr for probable ore.

** Silver grade calculated by Dave Barr for probable ore was 1.37 ounces/tonne.

DISCOUNTED CASH FLOWS

The following pages show the calculations of the net present values under six different grade assumptions (Cases A, B, C, D, E and F) and for two different mine life assumptions (3 years and 6 years). A summary of the results (in thousands of dollars) is provided below:

		Net Present Values	
	Grades	3-Year Life	6-Year Life
		(thousands of dollars)	
Grade of Proven and Probable Reserves			
Case "A" (Diluted to 1.2 meters at 1/4 the sampled grade)	0.98 opt Au 1.59 opt Au	$ 19,565	$ 43,606
Case "C" (Diluted to 1.0 meters at average grade and from 1.0 to 1.2 meters at zero grade	1.43 opt Au 2.37 opt Ag	$ 37,334	$ 76,726
Case "E" (Diluted to 1.2 meters at zero grade)	0.73 opt Au 1.17 opt Ag	$ 9,635	$ 25,154
Grade of Proven, Probable and Possible Reserves			
Case "B" (Diluted to 1.2 meters at 1/4 the sampled grade)	1.01 opt Au 1.66 opt Ag	$ 20,755	$ 45,823
Case "D" (Diluted to 1.0 meters at average grade and from 1.0 to 1.2 meters at zero grade)	1.46 opt Au 2.39 opt Ag	$ 38,525	$ 78,947
Case "F" (Diluted to 1.2 meters at zero grade)	0.76 opt Au 1.21 opt Ag	$ 10,844	$ 27,394

Cash Flow in Thousands of Canadian Dollars

Case "A"

(3 Year Life)

	Years					
	1	2	3	4	5	6
Capital/Exploration/W.Capital	500	1,500	18,000	0	0	(2,000)
Operating Margin				23,100	23,100	23,100
Capital Cost Allowable (C.C.A.)				14,000	0	0
After C.C.A.				9,100	23,100	23,100
Resource Allowance (R.A.)				2,275	5,775	5,775
After R.A.				6,825	17,325	17,325
Canadian Exploration				4,000	0	0
Taxable Income				2,825	17,325	17,325
Federal Tax at 28.84%				815	4,996	4,997
B.C. Tax at 14% (no R.A.)				714	3,234	3,234
Mineral Resource Tax (effective rate of 12.75%)				650	2,945	2,945
Total Taxes				2,179	11,175	11,176
Net Cash Flow	(500)	(1,500)	(18,000)	20,921	11,925	13,924
NPV Factors (at 5%)	0.952	0.907	0.864	0.823	0.784	0.746
Net Present Values	(476)	(1,361)	(15,552)	17,218	9,349	10,387

Cumulative Net Present Value = $19,565,000

Case "A"

(6 Year Life)

	Years								
	1	2	3	4	5	6	7	8	9
Net Cash Flow	(500)	(1,500)	(18,000)	20,921	11,925	11,924	11,925	11,924	13,924
NPV Factors	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645
Net Present Values	(476)	(1,361)	(15,552)	17,218	9,349	8,895	8,479	8,073	8,981

Cumulative Net Present Value = $43,606,000

Cash Flow in Thousands of Canadian Dollars

Case "B"

(3 Year Life)

	Years					
	1	2	3	4	5	6
Capital/Exploration/W.Capital	500	1,500	18,000	0	0	(2,000)
Operating Margin				24,080	24,080	24,080
Capital Cost Allowable (C.C.A.)				14,000	0	0
After C.C.A.				10,080	24,080	24,080
Resource Allowance (R.A.)				2,520	6,020	6,020
After R.A.				7,560	18,060	18,060
Canadian Exploration				4,000	0	0
Taxable Income				3,560	18,000	18,000
Federal Tax at 28.84%				1,027	5,209	5,209
B.C. Tax at 14% (no R.A.)				851	3,371	3,371
Mineral Resource Tax (effective rate of 12.75%)				775	3,070	3,070
Total Taxes				2,653	11,650	11,650
Net Cash Flow	(500)	(1,500)	(18,000)	21,427	12,430	14,430
NPV Factors (at 5%)	0.952	0.907	0.864	0.823	0.784	0.746
Net Present Values	(476)	(1,361)	(15,552)	17,634	9,745	10,765

Cumulative Net Present Value = $20,755,000

Case "B"

(6 Year Life)

	Years								
	1	2	3	4	5	6	7	8	9
Net Cash Flow	(500)	(1,500)	(18,000)	21,427	12,430	12,430	12,430	12,430	14,430
NPV Factors	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645
Net Present Values	(476)	(1,361)	(15,552)	17,634	9,745	9,273	8,838	8,415	9,307

Cumulative Net Present Value = $45,823,000

Cash Flow in Thousands of Canadian Dollars

Case "C"

(3 Year Life)

	Years					
	1	2	3	4	5	6
Capital/Exploration/W.Capital	500	1,500	18,000	0	0	(2,000)
Operating Margin				37,730	37,730	37,730
Capital Cost Allowable (C.C.A.)				14,000	0	0
After C.C.A.				23,730	37,730	37,730
Resource Allowance (R.A.)				5,932	9,432	9,432
After R.A.				17,798	28,298	28,298
Canadian Exploration				4,000	0	0
Taxable Income				13,798	28,298	28,298
Federal Tax at 28.84%				3,979	8,161	8,161
B.C. Tax at 14% (no R.A.)				2,762	5,282	5,282
Mineral Resource Tax (effective rate of 12.75%)				2,516	4,811	4,811
Total Taxes				9,257	18,254	18,254
Net Cash Flow	(500)	(1,500)	(18,000)	28,473	19,476	21,476
NPV Factors (at 5%)	0.952	0.907	0.864	0.823	0.784	0.746
Net Present Values	(476)	(1,361)	(15,552)	23,433	15,269	16,021

Cumulative Net Present Value = $37,334,000

Case "C"

(6 Year Life)

	Years								
	1	2	3	4	5	6	7	8	9
Net Cash Flow	(500)	(1,500)	(18,000)	28,473	19,476	19,476	19,476	19,476	21,476
NPV Factors	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645
Net Present Values	(476)	(1,361)	(15,552)	23,433	15,269	14,529	13,847	13,185	13,852

Cumulative Net Present Value = $76,726,000

Cash Flow in Thousands of Canadian Dollars

Case "D"
(3 Year Life)

	Years					
	1	2	3	4	5	6
Capital/Exploration/W.Capital	500	1,500	18,000	0	0	(2,000)
Operating Margin				38,710	38,710	38,710
Capital Cost Allowable (C.C.A.)				14,000	0	0
After C.C.A.				24,710	38,710	38,710
Resource Allowance (R.A.)				6,177	9,677	9,677
After R.A.				18,533	29,033	29,033
Canadian Exploration				4,000	0	0
Taxable Income				14,533	29,033	29,033
Federal Tax at 28.84%				4,191	8,373	8,373
B.C. Tax at 14% (no R.A.)				2,899	5,419	5,419
Mineral Resource Tax (effective rate of 12.75%)				2,641	4,936	4,936
Total Taxes				9,731	18,728	18,728
Net Cash Flow	(500)	(1,500)	(18,000)	28,979	19,982	21,982
NPV Factors (at 5%)	0.952	0.907	0.864	0.823	0.784	0.746
Net Present Values	(476)	(1,361)	(15,552)	23,850	15,666	16,398

Cumulative Net Present Value = $38,525,000

Case "D"
(6 Year Life)

	Years								
	1	2	3	4	5	6	7	8	9
Net Cash Flow	(500)	(1,500)	(18,000)	28,979	19,982	19,982	19,982	19,982	21,982
NPV Factors	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645
Net Present Values	(476)	(1,361)	(15,552)	23,850	15,666	14,907	14,207	13,528	14,878

Cumulative Net Present Value = $78,947,000

Cash Flow in Thousands of Canadian Dollars

Case "E"

(3 Year Life)

	Years					
	1	2	3	4	5	6
Capital/Exploration/W.Capital	500	1,500	18,000	0	0	(2,000)
Operating Margin				14,980	14,980	14,980
Capital Cost Allowable (C.C.A.)				9,647	4,353	0
After C.C.A.				5,333	10,627	14,980
Resource Allowance (R.A.)				1,333	2,657	3,745
After R.A.				4,000	7,970	11,235
Canadian Exploration				4,000	0	0
Taxable Income				0	7,970	11,235
Federal Tax at 28.84%				0	2,299	3,240
B.C. Tax at 14% (no R.A.)				0	1,674	2,097
Mineral Resource Tax (effective rate of 12.75%)				0	1,525	1,910
Total Taxes				0	5,498	7,247
Net Cash Flow	(500)	(1,500)	(18,000)	14,980	9,482	9,733
NPV Factors (at 5%)	0.952	0.907	0.864	0.823	0.784	0.746
Net Present Values	(476)	(1,361)	(15,552)	12,329	7,434	7,261

Cumulative Net Present Value = $9,635,000

Case "E"

(6 Year Life)

	Years								
	1	2	3	4	5	6	7	8	9
Net Cash Flow	(500)	(1,500)	(18,000)	14,980	9,482	7,733	7,733	7,733	9,733
NPV Factors	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645
Net Present Values	(476)	(1,361)	(15,552)	12,329	7,434	5,769	5,498	5,235	6,278

Cumulative Net Present Value = $25,154,000

Cash Flow in Thousands of Canadian Dollars

Case "F"

(3 Year Life)

	Years					
	1	2	3	4	5	6
Capital/Exploration/W.Capital	500	1,500	18,000	0	0	(2,000)
Operating Margin				15,960	15,960	15,960
Capital Cost Allowable (C.C.A.)				10,627	3,373	0
After C.C.A.				5,333	12,587	15,960
Resource Allowance (R.A.)				1,333	3,147	3,990
After R.A.				4,000	9,440	11,970
Canadian Exploration				4,000	0	0
Taxable Income				0	9,440	11,970
Federal Tax at 28.84%				0	2,722	3,452
B.C. Tax at 14% (no R.A.)				0	1,949	2,234
Mineral Resource Tax (effective rate of 12.75%)				0	1,775	2,034
Total Taxes				0	6,446	7,720
Net Cash Flow	(500)	(1,500)	(18,000)	15,960	9,514	10,240
NPV Factors (at 5%)	0.952	0.907	0.864	0.823	0.784	0.746
Net Present Values	(476)	(1,361)	(15,552)	13,135	7,459	7,639

Cumulative Net Present Value = $10,844,000

Case "F"

(6 Year Life)

	Years								
	1	2	3	4	5	6	7	8	9
Net Cash Flow	(500)	(1,500)	(18,000)	15,900	9,514	8,240	8,240	8,240	10,240
NPV Factors	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645
Net Present Values	(476)	(1,361)	(15,552)	13,135	7,459	6,147	5,859	5,578	6,605

Cumulative Net Present Value = $27,394,000

FAIR MARKET VALUES

Although the after-tax net present values (Case "A") are approximately $19.6 million over a three year life and $43.6 million over a 6 year life, these values must be reduced to arrive at the fair market value as at November 25, 1988. The probabilities as set out in the section on potential reserves must be applied. That is, Glanville has reduced the "three year life values" by 50% and reduced the incremental value (the increase in value from that for the three-year life to that for the six-year life) by 75%. The resulting value for Case A ($15,792,000) along with the sensitivity values (Cases B, C, D, E and F) are shown below.

	Values (000's of dollars)		
	3-Year Life	6-Year Life	Incremental
Case "A" Results	$ 19,565	$ 43,606	$ 24,041
Probabilities	50%		25%
Expected Values	9,782		6,010
Total Expected Value = $15,792,000*			
Case "B" Results	$ 20,755	$ 45,823	$ 25,068
Probabilities	50%		25%
Expected Values	10,377		6,267
Total Expected Value = $16,644,000			
Case "C" Results	$ 37,334	$ 76,726	$ 39,392
Probabilities	50%		25%
Expected Values	18,667		9,848
Total Expected Value = $28,515,000			
Case "D" Results	$ 38,525	$ 78,947	$ 40,422
Probabilities	50%		25%
Expected Values	19,262		10,105
Total Expected Value = $29,367,000			
Case "E" Results	$ 9,685	$ 25,154	$ 15,519
Probabilities	50%		25%
Expected Values	4,817		3,880
Total Expected Value = $8,697,000			
Case "F" Results	$ 10,847	$ 27,394	$ 16,550
Probabilities	50%		25%
Expected Values	5,422		4,137
Total Expected Value = $9,559,000			

* This is the fair market value as at November 25, 1988

BASE CASE (CASE "A") SENSITIVITIES

Several changes to the Base Case (Case "A") assumptions were made in order to see the impact of the changes on the net present values, as shown below:

	Net Present Values (000's of dollars)	
	3-Year Life	6-Year Life
Base Case (Case "A")	$ 19,565	$ 43,606
+10% in metal prices (or grades)	23,433	50,815
-10% in metal prices (or grades)	15,697	36,395
+10% in capital costs	18,634	42,675
-10% in capital costs	20,496	44,537
+10% in operating costs	18,502	41,625
-10% in operating costs	20,628	45,587

The expected values, as shown below, were calculated by reducing the above "three year life values" by 50% and the incremental values (the increases in values from those for the three year lives to those from the six year lives) by 75%:

	Expected Values
Base Case (Case "A")	$ 15,792,000
Plus 10% in prices	18,562,000
Minus 10% in prices	13,023,000
Plus 10% in capital costs	15,327,000
Minus 10% in capital costs	16,258,000
Plus 10% in operating costs	15,032,000
Minus 10% in operating costs	16,554,000

DISCUSSION REGARDING FAIR MARKET VALUE

As can be seen from the foregoing, the total expected value for Case "A" is approximately $15.8 million. It is Glanville's opinion that Case "A" incorporates the most realistic assumptions, and therefore represents the fair market value of the Sherwood Gold Mine Property. However, the sensitivity analyses show a range of values between $8.7 million (Case "A") and $29.4 million (Case "D"), with the lower value resulting from an assumption of dilution at zero grade and the higher value resulting from the assumption of dilution at the average grade out to 1.0 meters and then at zero grade from 1.0 to 1.2 meters. If one utilizes the assumption of dilution at the average grade to 1.0 meters and then zero grade from 1.0 to 1.2 meters (and utilizes the grade of only the proven and probable ore) the expected value is $28.5 million (Case "C"). One would expect, though, that the possibilities of achieving the projected ore reserves at the higher grade (resulting from assuming dilution at the average grade to 1.0 meters) would be lower than the probabilities estimated for achieving the projected ore reserves at the expected grade (resulting from assuming dilution at one-quarter of the grade over the sampled width). As a result, the calculated value, based on dilution at the average grade, should be lower than $28.5 million. Conversely, if one utilizes the ultra-conservative assumption of dilution at zero grade (and utilizes the grade of only the proven and probable ore) the expected value is $8.7 million. One would expect, though, that the probabilities of achieving the projected ore reserves at the lower grade (resulting from assuming dilution at zero grade) would be higher than the probabilities estimated for achieving the projected ore reserves at the expected grade (resulting from assuming dilution at one quarter of the grade over the sampled width). As a result, the calculated value, based on dilution at zero grade, should be higher than $8.7 million.

Based on the foregoing, it is my opinion that the fair market value of the Sherwood Gold Mine Property is approximately $15.8 million, with a reasonable range in value of $10 million to $20 million. Such an apparent wide range is not inconsistent with the normal risks inherent in mine

development, as well as the uncertainties of external factors such as the price of gold.

It should be emphasized that the definition of fair market value includes the words "highest price" that would be paid by "knowledgeable, prudent, and willing parties" who are "fully informed and not under compulsion to transact". Thus, one must reject an artificially low value that can be constructed by using unrealistic assumptions as to ore grade, ore tonnage (both existing and projected), gold price, metallurgical recovery, capital cost, treatment charges, transportation costs, and discount rate. It should also be noted that valuations of mineral properties change over time as a result of internal factors such as additional information about the specific orebody and as a result of changes to external factors such as metal prices, interest rates, inflation, etc. However, the focus of this valuation is at November 25, 1988, and the knowledge and factors impacting on the value at that time must be incorporated in any fair market valuation.

The following section on market capitalizations of companies with comparable deposits is relevant to the determination of value for the Sherwood Gold Mine Property. In spite of the fact that some of the comparable deposits are not yet in production and others closed down not long after the commencement of production, they were all accorded very substantial values (many tens of millions of dollars) by the market because of the expectation of discovering additional ore reserves. As with the application of any probabilities, subsequent actual results will vary for the different properties. In some cases much more ore will be found than expected, such as at Erickson where production commenced with reserves of only 10,000 tons and ultimate production was almost 600,000 tons. In other cases, less ore than expected will be found.

TAX IMPLICATIONS OF A CASH PAYMENT

Although the fair market value of the Sherwood Mine Property has been determined to be approximately $15.8 million, that value is an after-tax value. Consequently, if a cash payment by the province of B.C. were non-taxable (that is, no federal or provincial tax), then $15.8 million would be fair. However, if the settlement is taxable, the payment would have to be higher by the amount of the tax that would be payable on the higher amount.

COMPARABLE PROPERTIES

Criteria for Comparable Properties

In order to provide other indications of value of the Sherwood Gold Mine Property, I have reviewed a variety of gold mine annual reports, mining handbooks, and other information to select comparable properties. I also had discussions with professional geologists or mining engineers who were familiar with some of these other properties. Although no two properties are exactly alike, there are often enough similarities between properties to provide a reasonable range of values. Some of the criteria utilized to determine comparables are summarized below:

1. only gold properties;
2. gold properties located in British Columbia;
3. only underground gold mines or potential underground gold mines;
4. gold properties explored or developed within a few years prior to November 25, 1988;
5. gold properties that have produced, or would produce, at a mining rate similar to that expected for Sherwood.

Although the foregoing criteria result in a relatively small sample of comparable properties, the market capitalizations (share trading prices multiplied by the number of shares issued) of the companies that owned these properties (or portions thereof) did give an indication of what the general market believed the properties to be worth. One could argue that trading prices ef a few shares do not always represent value, but one cannot ignore the "collective wisdom of the market" over a period of time where substantial numbers of shares are bought and sold. To do so would be to ignore the reality of the market place, which sets values. One should not replace that collective judgment with one's own ideas of values. It is only when one does not have a valid market for properties, such as Sherwood (where access to the property was severely restricted), that one must utilize other methods at valuation. These include the adjusted discounted cash flow approach and the "market capitalization of comparables" approach.

Comparables Utilized by Wright Engineers

Wright Engineers (W.E.L.) has purported to have utilized "comparables" in their report of October 1990. It is my opinion, however, that the properties they utilized are not comparable for the following reasons:

1. W.E.L. applied no criteria for the selection of their properties for comparison to the Sherwood Gold Mine Property.

2. W.E.L. utilized all types of "property deals" which simply incorporates press releases disseminated by the various companies.

3. W.E.L. did not differentiate between gold properties and those of lead, zinc, copper, and industrial mineral properties.

4. Since the Stockwatch is mainly the medium for disseminating news for companies listed on the Vancouver Stock Exchange, there is a great distortion towards early-stage exploration properties. This occurs since most of the companies listed on the V.S.E. are small companies with early-stage exploration properties. Of the approximately 2,000 companies listed on the V.S.E. only a few are in production or have reserves. In fact, the deals on the properties that were in production in November 1988 or earlier would not have made the W.E.L. Stockwatch list.

5. W.E.L. did not include exploration and development by major companies (or by private companies) except where such companies made deals with V.S.E.-listed companies.

6. The period utilized by W.E.L. (over which the deals from Stockwatch were utilized) is very short (about three years) by exploration and mining standards, and is therefore not representative.

7. The period utilized by W.E.L. includes more than 1½ years after the November 25, 1988 valuation date.

8. The properties utilized by W.E.L. include the following:

   (i) "open pit" as well as "underground" properties;
   (ii) properties in countries other than Canada and other than British Columbia;
   (iii) properties that have had little or no work carried out on them as well as those with considerable work completed on them.

9. Although the deals from Stockwatch were over the period 1987 to mid-1990, there was no inclusion of the values of the major properties in the Eskay Creek or Mt. Milligan areas, two of which were each assigned values of well over $250 million by the market.

Comparables Utilized by Ross Glanville

The properties (and companies that owned these properties) that have been selected by Glanville as being comparable to the Sherwood property (existing and expected reserves) are summarized in this section. Much of the information was obtained from the Canadian Mines Handbook and annual reports of companies, as well as from professional geologists and mining engineers who were familiar with many of the properties. Where a company owned less than 100% of a comparable property, the whole property was valued by multiplying the market capitalization of the company by the factor determined by dividing 100% by "the property percentage owned by the company". All property values so determined were adjusted to 1988 dollars utilizing the Canadian Consumer Price Index.

The following comparables must be utilized with caution, however, because no two properties are exactly alike. As stated earlier, however, the attributed values do give indications of value. Some of the properties utilized as comparables have been in production, while others were not in

production as at November 25, 1988 (and some are still not in production). However, even the properties which were not in production still had very significant market capitalizations, an indication of the market's expectations.

Erickson Mine

The Erickson gold mine commenced production in December 1978 at 100 tons per day, and milling of ore continued at an average rate of about 200 tons per day (with some shutdowns, such as that due to a fire in the mill in early 1986) until 1989. The reserves mined during this period were almost 600,000 tons at a recovered grade of 0.40 ounces of gold per ton and 0.28 ounces of silver per ton. The recovered grade in the first four years of production (when production was at a rate of about 100 tons per day) was about 0.53 ounces of gold per ton and 0.53 ounces of silver per ton. Recovery of gold over that same period was 95.5%, so the in-place mineable reserves would have graded about 0.55 ounces per ton for both gold and silver. Overall recovery over the 10-year life of the mine was 93%, so the average grade of ore fed to the mill would have been about 0.43 ounces of gold per ton (about one half of the grade indicated at the Sherwood Gold Mine Property).

Reserves delineated when production commenced in 1978 were approximately 10,000 tons (less than one quarter of those already delineated at the Sherwood Mine Property). Production was initially taken from just one source, "the Jennie Vein". Driving underground to intersect this vein at depth revealed several more veins of economic ore grades. Reserves as at December 31, 1982 were 83,000 tons. After mining of almost 70,000 tons in 1983, the reserve level at the end of 1983 was 196,000 tons, an increase of 183,000 tons (196,000 plus 70,000 minus 83,000), or 220% in one year.

Control of Erickson changed in September 1985, when Total Compagnie Francoise of Paris, France, sold its wholly owned subsidiary, Total Eastcan Explorations to the Company for 17 million Erickson shares. Consequently, market capitalization as indications of the value of the Erickson Gold

property are only valid up to 1985. These market capitalizations, based on the average of the high and low price of the shares in a particular year, are shown below for the years 1978 to 1985.

Year	Market Capitalizations in 1988 Dollars (for 100% of the Property)
1978	$ 64.8 million
1979	77.0 million
1980	152.9 million
1981	96.9 million
1982	54.3 million
1983	118.0 million
1984	76.4 million
1985	40.9 million

Other points to note regarding the Erickson Mine:

(i) 1985 operating costs (when total production was 69,000 tons, or less than 200 tons per day) were $78 per ton, or $88 per ton in 1988 dollars.

(ii) 1986 operating costs (when total production was only 27,167 tons, or less than 100 tons per day) were $115 per ton, or $125 per ton in 1988 dollars.

(iii) The average grade of ore processed was about one half of the grade of the Sherwood reserves identified to date.

Blackdome Mine

Gold was first discovered at Blackdome in 1947, and extensive trenching and drilling was carried out in the late 1970's and early 1980's. By June of 1985, ore reserves totalled about 200,000 tons grading 0.79 ounces of gold per ton (slightly lower than the grade indicated at Sherwood). A production decision was made in late 1985 and in May 1986 the mill was started. Throughput was at the rate of 200 tons per day and recovery was almost 95%. The average grades of ore fed to the mill in 1987 and 1988 were 0.62 and 0.63 ounces of gold per ton, respectively.

The market capitalizations of the Blackdome property are shown below, in 1988 dollars:

Year	Market Capitalizations in 1988 Dollars (for 100% of the Property)
1983	$ 15.1 million
1984	10.8 million
1985	19.7 million
1986 (start of production)	65.1 million
1987*	90.0 million (approximately)
1988	47.6 million

* no prices in Canadian Mines Handbook, so prices taken from a graph

Other points to note regarding the Blackdome Mine:

(i) The 1985-1986 Canadian Mines Handbook estimated the cost of the 200 tpd operation would be $9.2 million.

(ii) The 1987-1988 Canadian Mines Handbook states tht $6.8 million was spent on construction of the 200 tpd mining and milling complex.

(iii) Although Heath Steele (an affiliate of Noranda Mines) carried out an extensive exploration program (and, during 1983, spent $2.0 million in underground work, including driving an exploration adit), Heath

Steele dropped its option. According to Frank Keane (as stated in his book entitled "The New Gold Rush") "Noranda is thought to have believed that the exploration was too small for them to get further involved". In spite of the option being dropped by a larger company, the mine was successfully placed into production in 1986 and had a value of $65 million ascribed to it by the stock market at that time.

(iv) After 7½ months of production, the year-end balance sheet showed no debt and over $7.4 million in working capital.

(v) In the year to December 31, 1987, sales were $28.6 million and cash flow was $12.7 million.

(vi) Estimated operating costs were approximately $120 per tonne.

(vii) The 1986 Annual Report of Mining Finance Corporation (M.F.C.) states that the $9.4 million Blackdome project was financed in May 1985 by an infusion of $8 million in equity capital provided by M.F.C.

(viii) To the end of the mine life in December 1990, there were 368,000 tons milled with average recovered grades of 0.64 ounces of gold per ton and 2.6 ounces of silver per ton.

Skyline

Production began at Skyline in August of 1988, at which time total reserves (including possible reserves) were 686,000 tons at a grade of 0.56 ounces per ton (less than two thirds of the grade at Sherwood). The market capitalizations of Skyline, based on the average of the high and low share price for the years, are as shown below:

Year	Market Capitalizations in 1988 Dollars
1986	$ 21.6 million
1987	85.0 million
1988	111.0 million

The estimated costs to production (according to the 1988-1989 Canadian Mines Handbook) were $20 million, and the capacity of the mill was estimated to be 400 tons per day. It should be noted that Skyline is located in a very remote area of northern British Columbia.

Dome Mountain

During part of the period 1985 to 1988, there was a legal dispute over the ownership of the Dome Mountain property. In the Canadian Mines Handbook, it is stated that Teeshin Resources Ltd. holds 75% and Canadian-United Minerals Inc. holds 25%. However, Total Energold had the right to back-in for 50% by providing 80% of the capital to bring the property to production. As a result, the effective interests of Teeshin and Canadian-United could be approximately 50% and 17%, respectively. The property value based on the market capitalizations of Teeshin and Canadian-United would be as follows:

Year	Teeshin ($ million)	Canadian-United ($ million)	Average ($ million)
1985	$ 38.7	$ 24.2	$31.5
1986	18.0	26.3	22.2
1987	25.9	32.9	29.4
1988	15.8	33.4	24.6

Drill indicated reserves in 1986 were approximately 240,000 tons at 0.46 ounces of gold per ton (about half of the grade of the Sherwood ore) and 2.3 ounces of silver per ton. In 1988 reserves were stated to be 400,000 tons of 0.40 ounces of gold per ton.

A preliminary feasibility sutdy in 1988 indicated the following:

(i) Diluted ore reserves of 300,000 tons grading 0.36 opt Au and 2.35 opt Ag

(ii) Mine production of 425 tons per day for 5 days per week.
Mill production of 300 tons per day for 7 days per week.

(iii) Capital costs, including working capital of $2.3 million, of $16.9 million.

(iv) Operating costs of $71 per ton.

(v) Gold recovery of 95%.

In spite of the legal dispute regarding ownership of the property, the market capitalizations of the two companies that own interests in the Dome Mountain property imply a value of the property averaging over $25 million through the period 1985 to 1988 inclusive. That value ignored a 4% net smelter return royalty, which could be equivalent to about 15% to 20% of the total value of the property. Consequently, the implied value of 100% of the property (with no royalties) would be over $30 million. That value is for a property that is not in production, and has a grade of only 40% of

that of Sherwood. Although the contained ounces of gold at Sherwood would be approximately 40% of those indicated for Dome Mountain, the profitability of Sherwood would be much higher due to the grade being more than twice as high as that of Dome Mountain. The operating margins per tonne are outlined below:

	Dome Mountain	Sherwood
Gold Grade	0.39	0.98
Silver Grade	2.59	1.59
Gold Recovery	90%	90%
Silver Recovery	90%	90%
Gold Price	$ 504	$ 504
Silver Price	$ 7.30	$ 7.30
Gold Revenue	$ 177	$ 445
Silver Revenue	17	10
Total Revenue	$ 194	$ 455
Operating Cost	78	125
Operating Margin	$ 116/tonne	$ 330/tonne

Snip Property

Drilling in 1987 indicated reserves for the Snip Property of 1.2 million tons grading 0.70 ounces of gold per ton. Delaware owns 40% of the property, with Cominco owning the other 60% (subject to delivery of a production notice to Delaware and by expending two times the exploration expenditures funded by Delaware). The Snip property is located in a very remote area 65 miles northwest of Stewart, British Columbia. Because of extreme topographic relief, the property has a severe climatic gradient, ranging from a modified coastal climate at the airstrip to near-arctic conditions at higher elevations.

The market capitalizations of Delaware (based on an effective interest of approximately 45%) have been utilized to ascribe values to the Snip property in 1987 and 1988, as shown below:

Year	Value of 100% of Snip Property
1987	$ 90 million
1988	250 million

Sulphurets Property

The Sulphurets property was owned (in 1986) 40% by Granduc Mines Ltd., 30% by Newhawk Mines Ltd., and 30% by Lacana Mines. After 1986, the property was owned 40% by Granduc and 60% by Newhawk. In late 1988, reserves were stated to be 855,000 tons grading 0.35 ounces of gold per ton and 22.9 ounces of silver per ton. Preliminary indications were that ultimate production would be at a rate of about 500 tons per day.

The market capitalizations of Granduc and Newhawk have been utilized to ascribe approximate values to the Sulphurets property, as shown below:

	Values of 100% of Sulphurets based on:	
Year	Granduc	Newhawk
1987	$53.2 million	$53.7 million
1988	$76.0 million	$99.8 million

It should be noted that the Sulphurets property was not in production on November 25, 1988.

Willa Property

Northair Mines Limited was granted an option to earn an interest in the Willa property, located 12 kilometers south of New Denver, British Columbia. Northair's interest increased from 56% in 1986 to 78% in 1988. In 1986, reserves were estimated at 547,000 tons grading 0.18 ounces of gold per ton and 0.87% copper, or a gold equivalent value of approximately 0.22 ounces per ton. In 1986, proven, probable, and possible reserves in four zones totalled almost 700,000 tons, averaging 0.18 ounces of gold per ton and 0.92% copper, or a gold equivalent value of about 0.23 ounces per ton (approximately one quarter of the grade at Sherwood). The market capitalizations of Northair have been utilized to ascribe values to the Willa property, as shown below:

Year	Market Value of Willa (in 1988 dollars)
1986	$24.2 million
1987	$30.8 million
1988	$17.5 million

Skylark

Skylark Resources Ltd. owned 95% of some claims and 50% of other claims covering the former gold-silver producer, Skylark-O.B. Mines, two miles east of Greenwood, British Columbia. In 1986 reserves were approximately 10,000 tons grading 21.1 ounces of silver per ton and .08 ounces of gold per ton. Production began in late 1987, and from December 1987 to August 1988, production amounted to 213,000 ounces of silver and 882 ounces of gold. Based pn the foregoing, production was established to have been about 12,000 tons.

The market capitalizations of Skylark Resources Ltd. have been utilized to ascribe values to the Skylark property, as shown below:

Year	Market Value of Skylark (in 1988 dollars)
1986	$13.7 million
1987	$18.7 million
1988	$16.8 million

The foregoing value is attributed to a property that had reserves of just over 10,000 tons with a gold equivalent grade of approximately 0.35 ounces per ton. The tonnage is about one quarter that already delineated at Sherwood, and only about 40% of the grade.

Privateer Property

New Privateer Mines Limited owns the former gold producer, Privateer Mine, in the Zeballos area of Vancouver Island. In 1985-1986, development took place on the mine and a new vein system, including a 700-foot tunnel to intersect the old workings. In 1986, a 100 ton per day pilot mill was purchased, and in 1987 underground development on the 1100-foot level intersected #4 vein. Reserves were estimated to be 135,000 tons averaging 0.50 ounces of gold per ton.

The market capitalizations of New Privateer Mine have been utilized to ascribe values to the Privateer property, as shown below:

Year	Market Value of Privateer (in 1988 dollars)
1986	$13.3 million
1987	$17.7 million
1988	$10.5 million

SHERWOOD MINE VALUATION IN RELATION TO VALUATIONS OF COMPARABLES

As can be determined from the previous section, the valuations of the comparable properties in 1988 dollars (based on market capitalization of the companies owning interests in the properties) were very substantial in the periods prior to the valuation date of November 25, 1988. The valuations are summarized below:

Property	Period	Approximate Range of Market Values ($ million)	Mid-Point Values ($ million)
Erickson	1978 to 1985	$41 to $153	$ 97.0
Blackdome	1983 to 1988	$11 to $90	50.5
Skyline	1986 to 1988	$22 to $111	66.5
Snip	1987 to 1988	$90 to $250	170.0
Sulphurets	1987 to 1988	$53 to $100	76.5
Dome Mountain	1985 to 1988	$16 to $39	27.5
Willa	1986 to 1988	$17 to $31	24.0
Skylark	1986 to 1988	$14 to $19	16.5
Privateer	1986 to 1988	$10 to $18	14.0

From the foregoing one can see that the "mid-point values" range from $14 million to $170 million, with a median mid-point value of $50 million dollars. As stated earlier, some of the foregoing properties had reserve tonnages much less than those already identified at Sherwood while others had reserve tonnages several times as great as those at Sherwood. In all cases, however, the grade of the reserves were lower than those of Sherwood. Some of the properties were in extremely remote areas with severe climates, while others were in relatively accessible areas. Some of the properties were in production, others had operated and shut down, and others had never been in production before.

Although there are a variety of differences between the comparable properties, they have many factors in common. These include the following:

(i) All are gold properties (with some silver).

(ii) All are located in British Columbia.

(iii) All have produced or could be expected to produce at rates of between 100 and 500 tons per day.

(iv) All have been or are expected to be mined by underground mining methods.

(v) All were actively explored or developed in a relatively short period (a few years) prior to November 25, 1988.

(vi) All were owned by companies listed on stock exchanges, so information was available regarding the market's indications of value.

Based on the foregoing similarities, it is my opinion that these comparable properties do give an indication of the fair market value of the Sherwood property. In addition, they do support the valuation of Sherwood arrived at by the adjusted discounted cash flow method. That value of $15.8 million appears to be relatively conservative in relation to the values of most of the comparable properties.

APPENDIX I

CERTIFICATE OF ROSS GLANVILLE

CERTIFICATE OF QUALIFICATION

I, Ross O. Glanville, of 7513 Pandora Drive, Burnaby, British Columbia, Canada, hereby certify that:

(1) I graduated with a B.A.Sc. (Mining Engineering) from the University of British Columbia (1970).

(2) I hold a Masters Degree in Business Administration (M.B.A.) from the University of British Columbia (1974).

(3) I am a registered member of the Association of Professional Engineers of British Columbia, and have been since 1972.

(4) I am a registered member of the Certified General Accountants Association of British Columbia.

(5) I am President of Ross Glanville & Associates Ltd., a company specializing in the valuations of exploration properties and mining companies.

(6) I have been practising my mining engineering profession since 1970 and have valued exploration and mining properties in many parts of Canada, the U.S.A., and Australia, as well as in other areas of the world.

(7) I was formerly President of Giant Bay Resources Ltd. and Vice-President - Valuations of Wright Engineers Limited, a large international mining, engineering, and consulting company. Prior to that I was a mining engineer and transportation manager with Placer Development Ltd., and a mining and project analyst with two major investment holding companies.

(8) My report is based on the terms of reference as set out in this valuation report.

(9) I have no interest, nor do I expect to receive any interest, either directly or indirectly, in either S.C.M. Services Ld. or associated companies.

(10) I herewith grant my permission for S.C.M. Services Ltd. to use this report for whatever purpose they deem necessary, subject to the limitations set out in the "Introduction and Terms of Reference".

DATED in Vancouver, British Columbia, on the 16th day of July, 1991.

R.O. Glanville, B.A.Sc., P.Eng., M.B.A., C.G.A.

APPENDIX II

CANADIAN PRODUCERS OF PRECIOUS METALS

Canadian Research Report
Research Department

CANADIAN PRODUCERS OF PRECIOUS METALS

Ray Goldie 82-119 September 1982

Gold prices are strongly influenced by expectations of future inflation rates in the Western World. These expectations are, in turn, strongly influenced by real growth rates in the industrial sector of the American economy.

These relationships are illustrated on the back page. Note the similarity in economic trends in the two 56-month periods January 1972 to August 1976, and July 1977 to February 1982. In each period, 21 months of industrial growth was followed by 12 months of no growth, then a sharp decline. In 1975, a sluggish recovery, held down by inventories, followed the decline. In 1981, there was a sluggish recovery, followed by another sharp decline which probably ended in February 1982.

Worries about inflation reached a crescendo following the start of the decline in each period, but before the full effects of the decline had become apparent. **The price of gold, therefore, reached long-term peaks 4-6 months after industrial production began to fall.** Subsequently, gold prices subsided, along with inflationary worries, as the economy deteriorated. Note that short-term flurries in price, due largely to political events, were super imposed on the long-term trends.

RICHARDSON GREENSHIELDS OF CANADA LIMITED
GEORGE T. RICHARDSON, CHAIRMAN

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Agnico-Eagle Mines Ltd. G	AGE	$9.625	nil	Eagle mine, NW Quebec	100%)))	Massive sulphides in Precambrian volcanic rocks
				Telbel mine, NW Quebec (1984)	97%))	
				Cobalt area mines, NE Ontario	100%	Veins in and near a Precambrian gabbro sill
American Pyramid Resources Inc. G	APE	$2.15	$1.94[4]	Bell Mt., Nevada (1982) [5]	100%	Giant vein in Tertiary volcanic rocks
Bachelor Lake Gold Mines Inc. G (Que. Sturgeon River owns 55%)	BLG	$4.25	nil	Lesueur Township, NW Quebec (1982)	100%	Veins in Precambrian volcanic rocks
Belmoral Mines Ltd. G	BME	VSE suspension since July 13	$4.60[6]	Ferderber mine, NW Quebec (1979)	100%)))	Veins Precambrian granitic rocks
				Bras d'Or's Dumont mine, NW Quebec (1980)	55%))	
Cadillac Explorations Ltd.	CXQ	$2.25	nil	Prairie Creek, western NWT (1982)	60%	N.A.
				Dawson City, Yukon (1981)	45%	Placer gold

KEY

G : A stock offering a relatively pure exposure to gold
S : A stock offering a relatively pure exposure to silver
N.A.: Not available

FOOTNOTES

[1] Reserves as of January, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc zinc per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
(N.A. ; 3.6	20	0.18	0.04	45.	--	3.2	--	$235g
(N.A.	20	0.18	0.04	60.	--	4.3	--	--
N.A.	1	--	N.A.	--	560.[3]	--	40.[3]	$12.90s
1.1 ; 4.0	14	0.04	1.45	16.5	500.	4.9	150.	$150g
1.0 ; 4.0	12	0.20	--	32.0	--	4.8	--	$235g
(1.4 ; 5.8	18	0.20	--	41.5	--	5.4	--	$470g
(0.5 ; 2.4	6	0.21	--	24.	--	3.0	--	$470g
				TOTAL SHARE OF 1982 PRODUCTION:		8.4	--	
1.6 ; 4.4	15	--	5.4	--	1400.	--	200.	$ 6.6s
N.A.	--	0.04	--	17.4	--	2.5	--	$ 36g

[3] Production is shut down awaiting better silver prices.

(4] Could be as much as $3.80 at the start of production.

[5] Difficulties in obtaining finance could delay the start-up until 1983.

[6] Estimated long-term debt as of April 1982. On July 13, 1982 the Continental Illinois Bank (Canada) Ltd. called a loan of $30 million ($3.64 per share). The effect of this action on the ownership and continued operation of the mines has yet to be determined.

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Camchib Resources Inc. (Campbell Resources owns 83%)	CUM	$4.60	$ 3.09[3]	Gwillim mine	100%	Quartz-carbonate veins in Precambrian volcanic rocks
				Henderson mine II	100%)	Massive sulphide shear zones in Precambrian anorthosites
				Cedar Bay mine	100%)	
				B-Zone, N.W.T. (250 miles NW of Churchill, Manitoba) (1982)	10%[4]	Massive sulphides in Precambrian sedimentary rocks
Camflo Mines Ltd.	CMF	$8.75	$22.05	Camflo mine, NW Quebec	100%)	Veins and disseminations in Precambrian granitic rocks
				Malartic Hygrade extension of Camflo orebody (1981)	40%)	
				Pinson mine, Nevada; milling ore (1981)	11.73%)	Disseminated fine-grained gold of Tertiary age deposited in Paleozoic sedimentary rocks
				Pinson mine, Nevada; heap-leach ore (1982)	11.73%)	
				Preble mine, Nevada (1984)	11.73%)	

KEY

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S : A stock offering a relatively pure exposure to silver
N.A.: Not available

FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
0.2 ; 3.0	20	0.20	--	31.7	--	14.8	--	
5.2 ; 16		0.04	--					$325g[3]
0.9 ; 15		0.10						
0.3 ; 4.0	6	0.50	--	4.6	--	2.2	--	$280g[5]
			TOTAL SHARE OF 1982 PRODUCTION:			17.0	--	
2.7 ; 40	20	0.14	0.01	62.5	3.1	15.3	1.	$155g
8.0 ; 40	20	0.25	0.01	12.5	0.6	3.1	--	$130g
2.9 ; 8	10	0.12[6]	--	6.0	--	1.5	--	$195g
5.5 ; N.A.	--	0.05	--	N.A.	--	--	--	$350g[7]
1.3 ; N.A.	--	0.12	--	N.A.	--	---	--	N.A.
			TOTAL SHARE OF 1982 PRODUCTION:			20.0	1.	

[3] Based on common shares outstanding as of June 30, 1981.

[4] The company has an option to take up 4 million shares of Cullaton Lake Gold Mines Ltd., equivalent to another 18.7% share of this mine's operations.

[5] Subject to revision once current mining and milling difficulties are corrected.

[6] Realized grades have been 0.06 - 0.07 ounces per ton higher.

[7] Ore to be heap-leached is counted as waste in computing costs for the ore to be milled. This figure includes the mining costs of only the material to be treated, plus leaching and smelting costs.

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Campbell Red Lake Mines Ltd. G (Dome Mines owns 57%)	CRK	$17.50	$0.21	Campbell mine, NW Ontario	100%	Veins in Precambrian volcanic rocks
				Detour Lake, NE Ontario open pit (1983)	25%)	Veins and strata in Precambrian volcanic rocks
				Detour Lake, NE underground mine (1987)	25%)	
Carolin Mines Ltd. G	CLL	$12.375	$1.83	Idaho mine, south-central B.C. (1982)	50%[3]	Veins, strata and shear zones in Mesozoic mudstones metamorphosed to schists
Consolidated Louanna Gold Mines Ltd.	CLU	$ 0.74	nil	O'Sullivan Lake, NW Ontario (1982)	75%[5]	Quartz veins and sulphide veins in Precambrian rocks
Cullaton Lake Gold Mines Ltd. G (Harbinson Group Companies own 15%) [6]	CUG	$ 1.75	nil	B-Zone, N.W.T. (250 miles NW of Churchill, Manitoba) (1982)	90%	Massive sulphides in Precambrian sedimentary rocks
Cumo Resources Ltd.	CUS	$ 3.05	$0.50	O'Sullivan Lake, NW Ontario (1982)	25%[8]	Quartz veins and sulphide veins in Precambrian rocks

KEY

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FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
2.0 ; 5.2	20	0.62	--	200.0	--	4.1	--	$145g
3.2 ; 5.5	6	0.13	--	24.5	--	0.5	--	$305g
24.1 ; 18.8	30			31.3	--	0.6	--	$385g
1.7 ; 3.5	--	0.14	--	29.0	--	6.0	--	$120g[4]
0.4 ; 7.0	20	0.38	0.1	13.5	3.	4.7	0.9	N/A
0.3 ; 4.0	6	0.50	--	41.0	--	2.1	--	$280g[7]
0.4 ; 7.0	20	0.38	0.1	4.5	1.	0.9	0.2	N/A

[3] 50% of the first $15.6 million cash flow, 100% of the next approximately $4 million, 0% of the net approximately $20.4 million, 33% of the next approximately $24.4 million and 50% of remaining cash flow.

[4] Resolution of some operational problems could substantially increase the projected break-even price.

[5] 0% of the first $1.5 million; 25% of the next $1.5 million, 75% thereafter.

[6] Fully diluted (15.3 million shares are outstanding; Camchib Resources has an option to take up another 4 million shares).

[7] Subject to revision once current mining and milling difficulties are corrected.

[8] 100% of the first $1.5 million; 75% of the next $1.5 million, 25% thereafter.

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Dickenson Mines Ltd.	DML.A[3]	$ 2.30	nil	Dickenson mine and Robin Red Lake extension, NW Ontario	65%[4]	Veins in Precambrian volcanic rocks
				Silvana mine, south-central B.C.	100%	Silver-lead-zinc veins in Mesozoic rocks
Discovery Mines (Rayrock owns 41%)	DSM	$ 1.27	nil	Pinson mine, Nevada; milling ore (1981)	9.3%	Disseminated fine-grained gold of Tertiary age deposited in Paleozic sedimentary rocks
				Pinson mine, Nevada; heap-leach ore (1982)	9.3%	
				Preble mine, Nevada (1984)	9.3%	
Dome Mines Ltd. (Dome Petroleum owns 39%)	DM	$10.875	$1.22	Dome mine, NE Ontario	100%	Veins and disseminated mineralization in Precambrian volcanic and sedimentary rocks and porphyritic intrusions
				Sigma mine, NW Quebec	66.2%	Veins and shear zones in Precambrian volcanic rocks and porphyritic intrusions
				Campbell mine, NW Ontario	56.8%	Veins in Precambrian volcanic rocks

KEY

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S : A stock offering a relatively pure exposure to silver
N.A.: Not available

FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
2.3 ; 11	15	0.23	--	23[5]	--	2.2	--	$335g
N.A.	--	--	N.A.	--	305.[6]	--	30.	$7.95s
2.9 ; 8	10	0.11[7]	--	4.8	--	1.1	--	$195g
5.5 ; N.A.	--	0.05	--	N.A.	--	N.A.	--	$350g[8]
1.3 ; N.A.	--	0.12	--	N.A.	--	N.A.	--	N.A.
2.1 ; 3.2	20	0.21	--	86[9]	--	1.2	--	$350g
1.2 ; 15[10]	15	0.12	--	36.	--	0.4	--	$365g
2.0 ; 5.2	20	0.62	--	114.	--	1.5	--	$145g

cont'd...

[3] Class A subordinate voting shares.
[4] Sullivan Mining Group Ltd. has acquired the remaining 35% interest.
[5] To reach 36,000 ounces per year by mid-1983.
[6] Silvana was closed during Cominco's summer shut-down; 1983 production could be 340,000 ounces.
[7] Realized grades have been 0.06-0.07 ounces higher.
[8] Ore to be heap-leached is counted as waste in computing costs for the ore to be milled. The $350 figure includes the mining costs of only the material to be treated, plus leaching and smelting costs.
[9] To increase about 30% by October, 1984.
[10] At current grades and production rates for 5 years, followed by 10 years of declining grades and tonnages.

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Dome Mines Ltd. (cont'd)	DM	$10.875		Queenstake's Clear Creek dredge, Yukon	8.7%	Placer gold
				Detour Lake, NE Ontario open pit (1983)	39.2%	Veins and strata in Precambrian volcanic rocks
				Detour Lake, NE Ontario underground mine (1987)	39.2%	
Echo Bay Mines Ltd. G (IU International owns 100%)	ECO(PR)	$15.126	nil[3]	Lupin mine, Contwoyto Lake western NWT (1982)	93%[4]	Veins in a lens of Precambrian amphibolite
Equity Silver Ltd. S (Placer owns 70%)	EST	$16.00	$7.98	Sam Goosly mine, west-central B.C. (1981)	100%	Massive sulphides, and "porphyry-type" veins and disseminations in Mesozoic volcanic rocks intruded by Tertiary granitic rocks
Giant Yellowknife Mines Ltd. (Falconbridge owns 19%)	GYK	$10.00	nil	Giant mine, Yellowknife, NWT	100%	Shear zones in Precambrian volcanic rocks
				Lolor mine, Yellowknife, NWT	87.5%	

KEY

G : A stock offering a relatively pure exposure to gold
S : A stock offering a relatively pure exposure to silver
N.A.: Not available

FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
4. ; 12	12	0.01	--	0.26	--	--	--	$360g
3.2 ; 5.5	6	0.13	--	38.4	--	0.6	--	$305g
24.1 ; 18.8	30			49.0	--	0.7	--	$385g
			TOTAL SHARE OF 1982 PRODUCTION:			3.1	--	
2.4 ; 6.7	20	0.35	--	108.	--	69.7[5]	--	$425g
30.8 ; 19	40	0.03	3.1	10.5[6]	5,700.[6]	1.3	690.	$3.95s[6]
1.2 ; 3.1	10	0.23	N.A.	72.	10.	16.7	--	$425g
0.02 ; 2.8	3	0.24	N.A.	1.0	--	0.2	--	$370g
			TOTAL SHARE OF 1982 PRODUCTION:			16.9	--	

[3] 6.2 million warrants are outstanding. Each carries the right to purchase 0.0706 of a troy ounce of gold (a total of 0.438 million troy ounces of gold) from Echo Bay at $595 U.S. per troy ounce. A quarter of the warrants will be exercisable on each of the following dates: Jan. 31, 1986, Jan. 31, 1987, Jan. 31, 1988 and Jan. 31, 1989. $5.25 U.S. of the value of each warrant ranks ahead of preferred share obligations.

[4] 93% for the first $400,000 of net smelter proceeds; 96% subsequently until 1980 when a new agreement will be negotiated.

[5] Per preferred share. 100% of the common shares are held by IU International Ltd.

[6] Production will be at this rate and cost once the leach plant is in full operation (probably late 1982).

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Goldlund Mines Ltd. G	GOL	$ 1.15	nil	Echo township mine, NW Ontario	100%	Veins in Precambrian volcanic rocks
Hallmac Mines Ltd. S	HLC	$ 0.95	nil	Hallmac mine, SE B.C. (1980) [4]	100%	Direct-shipping ore from veins of sulphides in Mesozoic sedimentary rocks
Kerr Addison Mines Ltd. (Noranda owns 43%)	KER	$17.00	nil	Kerr Addison mine, NE Ontario	100%	Veins and disseminated pyrite in Precambrian volcanic rocks and carbonate rocks
Kiena Gold Mines Ltd. G (Falconbridge owns 68%)	KGM	$12.625	$4.47	Dubuisson township mine, NW Quebec	100%	An enigmatic, mineralized breccia between two Precambrian ultramafic flows

KEY

G : A stock offering a relatively pure exposure to gold
S : A stock offering a relatively pure exposure to silver
N.A.: Not available

FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
0.8 ; 16	30	0.14	--	11.7	--	1.4[3]	--	$265g[3]
0.02 ; 20	20	--	N.A.	--	46.[5]	--	12.[5]	$4.60s[5]
0.68 ; 3.2	2	0.147	--	41.	--	4.3	--	$350g
5.8 ; 19	35	0.18	0.04	50.	9.	10.3	--	$330g

[3] Assuming initial production is from ore grading 0.26 oz/ton. Reserves of this grade are probably sufficient for several years' production. Subsequent costs could approximate $430 per ounce.

[4] The only production so far is from development work.

[5] Assuming continuation of the grades, recoveries and tonnages attained in the 13 months December 1980 - December 1981.

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Lacana Mining Corp. (Westmin owns 24%)	LCA	$6.375	$0.34	Las Torres, Guanajuato, Mexico	30%	Veins in Tertiary volcanic and sedimentary rocks
				La Encantada, Coahuila, Mexico	40%	Lenses, pipes and veins of sulphides in Mesozoic limestones and skarns
				Pinson mine, Nevada; milling ore (1981)	26.25%	Disseminated fine-grained gold of Tertiary age deposited in Paleozoic sedimentary rocks
				Pinson mine, Nevada; heap-leach ore (1982)	26.25%	
				Preble mine, Nevada (1984)	26.25%	
Little Long Lac Gold Mines Ltd.	LAC	$13.25	nil	Thomson-Bousquet mine, NW Quebec	30.6%	Massive sulphide beds in Precambrian volcanic and sedimentary rocks
				La Mine Doyon, NW Quebec	15.3%	
				Macassa mine, NE Ontario	30.6%	Veins in Precambrian granitic rocks

KEY

G : A stock offering a relatively pure exposure to gold
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FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
3.2 ; 5.7	10	0.05	7.5	10.0	1230.	1.1	130.	$2.45s
1.5 ; 7	7	--	8.3	--	460.	--	50.	$3.35s
3.2 ; 9	10	0.12[3]	--	13.5	--	1.4	--	$210g
5.5 ; N.A.	--	0.05	--	N.A.	--	--	--	$350g[4]
1.3 ; N.A.	--	0.12	--	N.A.	--	--	--	N.A.
			TOTAL SHARE OF 1982 PRODUCTION:			2.5	180.	
2.2 ; 6	4	0.14	0.03	25.	6.	6.7	--	$290g
3.5 ; 4.8	12	0.18	0.04	20.	5.	5.4	--	$205g
0.6 ; 4	10	0.48	--	15.5	--	4.3	--	$280g
			TOTAL SHARE OF 1982 PRODUCTION:			16.4	--	

[3] Realized grades have been 0.06-0.07 ounces per ton higher.

[4] Ore to be heap-leached is counted as waste in computing costs for the ore to be milled. This figure includes the mining costs of only the material to be treated, plus leaching and smelting costs.

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Long Lac Minerals Ltd. G (82% owned by the Lac Group)	LLC	$8.625	nil	Thompson-Bousquet mine, NW Quebec	100%	Massive sulphide beds in Precambrian volcanic and sedimentary rocks
				La Mine Doyon, NW Quebec	50%	
				Macassa mine, NE Ontario	100%	Veins in Precambrian granitic rocks
Malartic Hygrade Gold Mines (Canada) Ltd. G	MYC	$11.00	nil	Malartic Hygrade extension of the Camflo mine (1981)	60%	Veins and disseminations in Precambrian granitic rocks
Mosquito Creek Gold Mining Co. Ltd. G	MQO	$ 0.87	nil[3]	Mosquito Creek mine, east-central B.C. (1980)	50%	Veins in Paleozoic sedimentary rocks
New Forty-Four Mines Ltd. G	NFF	$ 2.25	N.A.	San Antonio mine, SE Manitoba (1982)	50%[4]	Veins in a Precambrian gabbroic sill which cuts sedimentary rocks
Northair Mines Ltd. G	NRM	$ 1.95	nil	Brandywine mine, SW B.C.	100%	Veins, disseminations and massive sulphides in Mesozoic volcanic rocks
				Scottie mine, west-central B.C.	21.5%	N.A.

KEY

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N.A.: Not available

FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

ed Reserves ons of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
.0 ; 25	4	1.10	0.02	80.	16.	3.1	--	$290g
.6 ; 15	20	0.13	0.03	68.5	13.	2.5	--	$205g
1.1 ; 9.5	10	0.46	0.06	53.8	6.4	2.0	--	$280g
			TOTAL SHARE OF 1982 PRODUCTION:			7.6	--	
0.2 ; 1.4	12	0.25	0.01	19.	1.	5.4	--	$130g
0.035 ; 1.8	6	0.5	0.1	9.0	1.8	1.9	--	$425g
0.8 ; 6.7	15	0.19	--	11.	--	5.8	--	$395g
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
0.2 ; 3	9	0.65	N.A.	11.6	7.2	2.1	--	$310g

[3] The company has short-term debt, of approximately $0.21 per share, which may be converted into a debenture.

[4] Brinco owns the other 50%.

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Pamour Porcupine Mines Ltd. G (Noranda owns 49%)	PAM	$17.00	nil	Pamour mine ("No. 1 mine"), NE Ontario	100%	Veins and disseminations around an unconformity between Precambrian sediments and the underlying volcanic rocks
				Aunor mine ("No. 3 mine"), NE Ontario	100%	
				Schumacher mine, NE Ontario	100%	Veins in Precambrian volcanic and intrusive rocks
				Hollinger mine ("Timmins underground project"), NE Ontario	100%	
				Ross mine, NE Ontario	100%	Veins in pipe-like Precambrian intrusions in volcanic rocks
				Hislop Township mine ("Canadian Arrow Property"), NE Ontario	46%	N.A.
				TOTAL INVENTORY IN OPERATING AND NON-OPERATING PROPERTIES:		

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FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
1.3 ; 2.2	1	0.08	--	50.	--	7.1	--	
0.2 ; 2.9	3	0.15	--	9.	--	1.3	--	$435g
0.2 ; 0.3	0.3	0.13	--	32.	--	4.6	--	
0.3 ; 1	7	0.12	--	32.	--	4.6	--	
0.6 ; 3.8	1	0.10	--	21.	--	3.0	--	
0.1 ; 0.3	0.3	0.06	--	3.5	--	0.5	--	N.A.
		TOTAL SHARE OF 1982 PRODUCTION:				21.0	--	
3.7 ; 2.1	10	0.05	0.04					

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Pegasus Gold Ltd. G	PGU	$5.50	nil	Zortman mine, central Montana	70%	The ore is oxidized and is treated by heap-leaching
				Landusky mine, central Montana	55%	
Peregrine Petroleum Ltd. G	PGR	$0.50	N.A.	Mosquito Creek mine, east-central B.C. (1980)	50%	Veins in Paleozoic sedimentary rocks
Quebec Sturgeon River Mines Ltd. G (Coniagas owns 20%)	QSR	$4.00	nil	Lesueur Township, NW Quebec (1982)	55%	Veins in Precambrian volanic rocks
Queenstake Resources Ltd. (Canada Tungsten owns 45%)	QTR	$2.15	nil	Clear Creek, Yukon	100%	Placer gold
Rayrock Resources Ltd. (Discovery controls 31%)	RAY[4]	$4.05	nil	Pinson mine, Nevada; milling ore (1981)	26.5%	Disseminated fine-grained gold of Tertiary age deposited in Paleozoic sedimentary rocks
				Pinson mine, Nevada; heap-leach ore (1982)	26.5%	
				Preble mine, Nevada (1984)	26.5%	

KEY

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S : A stock offering a relatively pure exposure to silver
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FOOTNOTES

[1] Reserves as of January 1, 1982 (or quoted start-up date), with the figure quoted in years computed at present or projected production rates.

[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
(17. ; 7	18	0.03	0.90)				)	
(			)				)	
(			)	41.	106	6.7	17.)	$300g[3]
(17. ; 7	18	0.03	0.33)				)	
(			)				)	
0.035 ; 1.8	6	0.5	0.1	9.0	1.8	1.9	--	$425g
1.0 ; 4	12	0.20	--	17.5	--	2.8	--	$235g
4.5 ; 12	12	0.01	--	3.	--	0.7	--	$360g
(2.9 ; 7	10	0.11[5]	--	4.8	--	1.1	--	$195g
(								
(5.5 ; N.A.	--	0.05	--	N.A.	--	--	--	$350g[6]
(								
(1.3 ; N.A.	--	0.12	--	N.A.	--	--	--	N.A.
(								

[3] Includes royalty payments.

[4] Subordinate voting shares.

[5] Realized grades have been 0.06-0.07 ounces per ton higher.

[6] Ore to be heap-leached is counted as waste in computing costs for the ore to be milled. This figure includes the mining costs of only the material to be treated, plus leaching and smelting costs.

Stock	Ticker Symbol	Recent Price	Long-Term Debt Per Share	Mines in, or near operation (start-up date)	Company's Share in the Mine	Geology
Royex-Sturgex G	RSM	$ 2.50	$0.49	B-Zone, N.W.T. (250 miles NW of Churchill, Manitoba) (1982)	18.7%[3]	Massive sulphides in Precambrian sedimentary rocks
Scottie Gold Mines Ltd. G (Northair owns 18%)	SDL	$ 3.75	$1.29	Scottie mine, west-central B.C. (1982)	100%	N.A.
Sigma Mines (Quebec) Ltd. G (Dome Mines owns 66%)	S	$10.875	$1.25	Sigma mine, NW Quebec	100%	Veins and shear zones in Precambrian volcanic rocks
T.R.V. Minerals Corp.	TVM	$ 2.20	nil	West End, Idaho	25%[6]	The ore is oxidized and is treated by heap-leaching
Willroy Mines Ltd. G (the Lac Group controls 72%)	WRY	$ 7.25	nil	Macassa mine, NE Ontario	36.1%	Veins in Precambrian granitic rocks
				Thompson-Bousquet mine, NW Quebec	36.1%	Massive sulphide beds in Precambrian volcanic and sedimentary rocks
				La Mine Doyon, NW Quebec	18%	

KEY

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N.A.: Not available

FOOTNOTES

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[2] Estimated metal price at which direct mine, mill and transportation costs (net of by-product credits) are just covered by revenues. The figures are in 1982 Canadian dollars, and assume that the prices of by-products maintain the following relationships: silver price = gold price/45, lead price per lb. = silver price per ounce/25, zinc price per lb. = silver price per ounce/20, copper price per lb. = silver price per ounce/10.

Quoted Reserves millions of tons; years [1]	"Most Likely" Reserves years	Quoted Reserve Grades Gold oz/ton	Silver oz/ton	Company's Share of Payable Metal, per annum, at 1982 (or start-up date) production rates thousands of ounces Gold	Silver	oz./1,000 shares Gold	Silver	Breakeven Price per ounce [2] g: gold; s: silver
0.3 ; 4.0	6	0.50	--	8.5	--	3.1	--	$280g[4]
0.2 ; 3	9	0.65	N.A.	54.	33.	17.9	10.	$310g
1.2 ; 15[5]	15	0.12	--	60.	--	7.5	--	$365g
N.A. ; N.A.	--	0.06	--	2.7	--	0.46	--	$185g
1.1 ; 9.5	10	0.46	0.06	19.	2.3	1.0	--	$280g
(12. ; 25	4	0.10	0.02	29.	5.6	0.8	--	$290g
(10.6 ; 15	20	0.13	0.03	25.	4.5	0.6	--	$205g
			TOTAL SHARE OF 1982 PRODUCTION:			2.4	--	

[3] Fully diluted (15.3 million shares are outstanding; Camchib Resources has an option to take up another 4 million shares).

[4] Subject to revision once current mining and milling difficulties are corrected.

[5] At current grades and production rates for 5 years, followed by 10 years of declining grades and tonnages.

[6] Canadian Superior Oil has the other 75%.

APPENDIX III

RESERVE HISTORY OF CANADIAN GOLD MINES

SUMMARY

From the tables on the next pages it can be seen that although the estimated mine lives in any particular year are often about 3 or 4 years, the actual mine lives in most cases have "turned out" to be many times that. For example, estimated mine lives for Dickenson, Dome, East Malartic, McIntyre, Pamour and Sigma have been stated at around 3 years, whereas actual production is shown at over 5 times that length, and will likely be even greater as mining continues in the future. In addition, the "factors" for several of the mines that started production before 1951 are well over 10 times, and in some cases more than 20 times the estimated mine life.

Estimated mine lives, as indicated above, are often very short (2 to 6 years, for example), because it is very costly to "prove up" reserves to such an extent that they classify as proven/probable/possible. However, most mine operators expect the actual reserves to be much greater than the stated reserves. In fact, many industry experts and analysts value gold properties based on a mine life much longer than that which the stated reserves imply. A specific example of an analyst's view of ore reserves is given in the attached report entitled Canadian Producers of Precious Metals, September, 1982. As can be seen in this report, the analyst's estimations of reserves are much greater than those of the companies themselves.

RESERVE HISTORY

INTRODUCTION

The "reserve history" of a selected group of Canadian gold mines has been analyzed by Wright Engineers Limited. The data base and detailed output from the analysis are shown in the attached computer output for each of the eleven mines. A brief description of each of the parameters is given below:

1. Stated Reserves - reserves as officially stated in millions of tons of ore at year end.
2. Actual Production - production in millions of tons of ore for each year.
3. Mill Capacity - approximate effective mill capacity in millions of tons of ore per year.
4. Estimated Mine Life - stated reserves divided by mill capacity.
5. Actual Production + Remaining Reserves
   - production from start-up (or after 1950) plus the remaining stated reserves for a particular year.
6. Actual Mine Life - "actual production + remaining reserves" divided by mill capacity.
7. Ratio of "Actual + Remaining" To Original
   - this is the ratio (for any particular year) of "actual production + remaining stated reserves" to the stated reserves at start up or 1951, if later.

RESERVE ANALYSIS OF SELECTED CANADIAN GOLD MINES

	Period Analyzed	"Average" Stated Reserve Life (Years)	Ratio of Actual Reserves to Original Reserves Over Period Analyzed	Mill Capacity (stpd)	Is 1st Year of Analysis Mine Start Up?	Is 1st Year of Analysis Mine Closure?
Agnico - Eagle	1974-1981	4	1.4	1000	Yes	No
Camflo	1966-1981	6	3.7	1300	No	No
Campbell Red Lake	1952-1981	4½	13.1	1000	No	No
Dickenson Mines	1956-1977	3	5.4	500	No	No
Dome Mines	1951-1981	3	7.5	2000	No	No
East Malartic Mines	1948-1978	3½	7.9	1800	No	Yes
Giant Yellowknife	1954-1981	5	5.7	1000	No	No
McIntyre Mines	1951-1971	3	3.4	1000	No	No
Northair Mines	1977-1982	N/A	1.6	250	Yes	No
Pamour Porcupine	1951-1981	2	13.2	3000	No	No
Sigma Mines	1957-1981	2½	7.0	1500	No	No

Ratios of Actual Reserves to Original Reserves

(Commencing in 1951 or start up, if later)

	After 5 Years	After 10 Years	After 15 Years	After 20 Years	After 25 Years	After 25 Years
Agnico Eagle	1.2	N/A	N/A	N/A	N/A	N/A
Camflo	1.6	2.7	3.7	N/A	N/A	N/A
Campbell Red Lake	2.8	4.5	6.0	8.0	10.4	13.1
Dickenson	2.2	3.8	4.6	5.3	N/A	N/A
Dome	2.1	3.2	4.3	5.2	6.4	7.5
East Malartic	2.0	3.4	4.6	5.8	7.5	N/A
Giant Yellowknife	2.2	2.9	3.3	4.9	5.8	N/A
McIntyre	1.9	2.6	3.1	3.4	N/A	N/A
Northair	1.6	N/A	N/A	N/A	N/A	N/A
Pamour	2.9	4.7	6.3	8.0	10.3	13.2
Sigma	2.1	3.3	4.6	6.0	N/A	N/A
Average	2.1	3.5	4.5	5.8	8.1	10.4

N/A - Not Applicable

CANADIAN GOLD MINES - PAGE 1

AGNICO-EAGLE

YEAR	1974	1975	1976	1977	1978	1979	1980	1981	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	2.584	2.602	2.223	1.597	1.239	1.306	1.230	1.211	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.195	0.310	0.346	0.364	0.362	0.368	0.357	0.290	0.263	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	7.2	7.2	6.2	4.4	3.4	3.6	3.4	3.4	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	2.778	3.106	3.072	2.810	2.815	3.248	3.530	3.801	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	7.7	8.6	8.5	7.8	7.8	9.0	9.8	10.6	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.12	1.11	1.01	1.01	1.17	1.27	1.37	0.00	0.00	0.00

CAMFLO

YEAR	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
1 - STATED RESERVES (MLN TONS) - YEAR END	2.041	2.078	1.715	2.109	2.174	1.946	2.247	2.631	3.008	2.725	2.401
2 - ACTUAL PRODUCTION (MLN TONS)	0.266	0.366	0.363	0.386	0.375	0.038	0.381	0.390	0.378	0.456	0.464
3 - MILL CAPACITY (MLN TPY)	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
4 - ESTIMATED MINE LIFE AT YEAR END	5.6	5.7	4.7	5.8	6.0	5.3	6.2	7.2	8.2	7.5	6.6
5 - ACTUAL PRODUCTION + REMAINING RESERVES	2.307	2.710	2.710	3.491	3.930	3.740	4.422	5.196	5.950	6.123	6.262
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	6.3	7.4	7.4	9.6	10.8	10.2	12.1	14.2	16.3	16.8	17.2
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.18	1.18	1.51	1.70	1.62	1.92	2.25	2.58	2.65	2.71

CAMPBELL RED LAKE

YEAR	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
1 - STATED RESERVES (MLN TONS) - YEAR END	0.632	0.764	0.764	0.817	0.956	1.035	1.043	1.079	1.097	1.128	1.130
2 - ACTUAL PRODUCTION (MLN TONS)	0.173	0.179	0.181	0.196	0.236	0.256	0.256	0.257	0.257	0.258	0.257
3 - MILL CAPACITY (MLN TPY)	0.182	0.182	0.182	0.182	0.255	0.255	0.255	0.255	0.255	0.255	0.255
4 - ESTIMATED MINE LIFE AT YEAR END	3.5	4.2	4.2	4.5	3.7	4.1	4.1	4.2	4.3	4.4	4.4
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.805	1.116	1.297	1.547	1.921	2.257	2.522	2.814	3.088	3.378	3.636
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	4.4	6.1	7.1	8.5	7.5	8.8	9.9	11.0	12.1	13.2	14.2
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.39	1.61	1.92	2.39	2.80	3.13	3.50	3.84	4.20	4.52

CANADIAN GOLD MINES - PAGE 1

AGNICO-EAGLE

YEAR	0	0	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CAMFLO

YEAR	1977	1978	1979	1980	1981	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	2.118	2.184	2.297	2.814	2.321	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.472	0.471	0.472	0.461	0.413	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.456	0.456	0.456	0.456	0.456	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	4.6	4.8	5.0	6.2	5.1	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	6.451	6.988	7.573	8.551	8.471	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	14.1	15.3	16.6	18.7	18.6	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	2.80	3.03	3.28	3.71	3.67	0.00	0.00	0.00	0.00	0.00	0.00

CAMPBELL RED LAKE

YEAR	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
1 - STATED RESERVES (MLN TONS) - YEAR END	1.132	1.138	0.928	0.969	1.069	1.140	1.179	1.216	1.255	1.256	1.317
2 - ACTUAL PRODUCTION (MLN TONS)	0.257	0.258	0.259	0.257	0.258	0.261	0.262	0.262	0.262	0.303	0.303
3 - MILL CAPACITY (MLN TPY)	0.255	0.255	0.255	0.255	0.255	0.255	0.255	0.255	0.255	0.301	0.301
4 - ESTIMATED MINE LIFE AT YEAR END	4.4	4.5	3.6	3.8	4.2	4.5	4.6	4.8	4.9	4.2	4.4
5 - ACTUAL PRODUCTION + REMAINING RESERVES	3.895	4.159	4.208	4.507	4.864	5.196	5.497	5.796	6.097	6.401	6.765
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	15.2	16.3	16.5	17.6	19.0	20.3	21.5	22.7	23.9	21.3	22.5
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	4.84	5.17	5.23	5.60	6.04	6.46	6.83	7.20	7.58	7.95	8.41

CANADIAN GOLD MINES - PAGE 1

AGNICO-EAGLE

YEAR	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CAMFLO

YEAR	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CAMPBELL RED LAKE

YEAR	1973	1974	1975	1976	1977	1978	1979	1980	1981
1 - STATED RESERVES (MLN TONS) - YEAR END	1.374	1.447	1.637	1.734	1.856	1.899	1.977	2.250	2.316
2 - ACTUAL PRODUCTION (MLN TONS)	0.304	0.290	0.300	0.301	0.297	0.301	0.300	0.304	0.370
3 - MILL CAPACITY (MLN TPY)	0.301	0.301	0.301	0.301	0.301	0.301	0.301	0.301	0.301
4 - ESTIMATED MINE LIFE AT YEAR END	4.6	4.8	5.4	5.8	6.2	6.3	6.6	7.5	7.7
5 - ACTUAL PRODUCTION + REMAINING RESERVES	7.126	7.489	7.978	8.376	8.795	9.138	9.516	10.093	10.529
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	23.7	24.9	26.5	27.8	29.2	30.3	31.6	33.5	35.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	8.85	9.30	9.91	10.41	10.93	11.35	11.82	12.54	13.08

CANADIAN GOLD MINES - PAGE 2

DICKENSON MINES LTD

YEAR	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
1 - STATED RESERVES (MLN TONS) - YEAR END	0.497	0.498	0.566	0.511	0.497	0.468	0.577	0.591	0.589	0.587	0.572
2 - ACTUAL PRODUCTION (MLN TONS)	0.157	0.164	0.163	0.171	0.172	0.172	0.176	0.179	0.178	0.177	0.173
3 - MILL CAPACITY (MLN TPY)	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
4 - ESTIMATED MINE LIFE AT YEAR END	2.8	2.8	3.2	2.9	2.8	2.7	3.3	3.4	3.4	3.3	3.3
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.654	0.818	1.049	1.166	1.324	1.466	1.751	1.944	2.120	2.295	2.452
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	3.7	4.7	6.0	6.7	7.6	8.4	10.0	11.1	12.1	13.1	14.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.25	1.61	1.78	2.03	2.24	2.68	2.97	3.24	3.51	3.75

DOME MINES LTD

YEAR	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
1 - STATED RESERVES (MLN TONS) - YEAR END	2.448	2.472	2.470	2.461	2.498	2.475	2.472	2.479	2.494	2.476	2.455
2 - ACTUAL PRODUCTION (MLN TONS)	0.688	0.687	0.687	0.698	0.712	0.710	0.697	0.708	0.713	0.715	0.715
3 - MILL CAPACITY (MLN TPY)	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725
4 - ESTIMATED MINE LIFE AT YEAR END	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
5 - ACTUAL PRODUCTION + REMAINING RESERVES	3.136	3.847	4.533	5.221	5.970	6.657	7.350	8.065	8.793	9.490	10.184
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	4.3	5.3	6.3	7.2	8.2	9.2	10.1	11.1	12.1	13.1	14.1
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.23	1.45	1.66	1.90	2.12	2.34	2.57	2.80	3.03	3.25

EAST MALARTIC MINES LTD

YEAR	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
1 - STATED RESERVES (MLN TONS) - YEAR END	1.802	2.363	1.973	1.729	1.808	1.813	1.818	1.871	1.867	1.867	1.889
2 - ACTUAL PRODUCTION (MLN TONS)	0.296	0.344	0.432	0.441	0.470	0.488	0.526	0.541	0.542	0.549	0.538
3 - MILL CAPACITY (MLN TPY)	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
4 - ESTIMATED MINE LIFE AT YEAR END	3.5	4.6	3.9	3.4	3.5	3.5	3.6	3.7	3.7	3.7	3.7
5 - ACTUAL PRODUCTION + REMAINING RESERVES	2.098	3.002	3.044	3.242	3.791	4.284	4.815	5.409	5.947	6.497	7.056
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	4.1	5.9	6.0	6.3	7.4	8.4	9.4	10.6	11.6	12.7	13.8
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.43	1.45	1.55	1.81	2.04	2.30	2.58	2.83	3.10	3.36

CANADIAN GOLD MINES - PAGE 2

DICKENSON MINES LTD

YEAR	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1 - STATED RESERVES (MLN TONS) - YEAR END	0.537	0.513	0.475	0.421	0.368	0.353	0.344	0.339	0.312	0.277	0.260
2 - ACTUAL PRODUCTION (MLN TONS)	0.169	0.161	0.174	0.164	0.122	0.120	0.106	0.106	0.091	0.082	0.086
3 - MILL CAPACITY (MLN TPY)	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
4 - ESTIMATED MINE LIFE AT YEAR END	3.1	2.9	2.7	2.4	2.1	2.0	2.0	1.9	1.8	1.6	1.5
5 - ACTUAL PRODUCTION + REMAINING RESERVES	2.587	2.723	2.859	2.969	3.038	3.143	3.240	3.341	3.405	3.451	3.521
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	14.8	15.5	16.3	16.9	17.3	17.9	18.5	19.1	19.4	19.7	20.1
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	3.96	4.17	4.37	4.54	4.65	4.81	4.96	5.11	5.21	5.28	5.39

DOME MINES LTD

YEAR	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
1 - STATED RESERVES (MLN TONS) - YEAR END	2.426	2.405	2.350	2.285	2.211	2.028	1.926	1.819	1.685	1.473	1.590
2 - ACTUAL PRODUCTION (MLN TONS)	0.714	0.715	0.714	0.713	0.712	0.709	0.713	0.705	0.690	0.658	0.630
3 - MILL CAPACITY (MLN TPY)	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725
4 - ESTIMATED MINE LIFE AT YEAR END	3.3	3.3	3.2	3.2	3.1	2.8	2.7	2.5	2.3	2.0	2.2
5 - ACTUAL PRODUCTION + REMAINING RESERVES	10.869	11.563	12.222	12.870	13.509	14.035	14.646	15.244	15.800	16.246	16.993
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	15.0	16.0	16.9	17.8	18.6	19.4	20.2	21.0	21.8	22.4	23.5
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	3.47	3.69	3.90	4.10	4.31	4.48	4.67	4.86	5.04	5.18	5.42

EAST MALARTIC MINES LTD

YEAR	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
1 - STATED RESERVES (MLN TONS) - YEAR END	1.888	1.905	1.822	1.825	1.681	1.558	1.559	1.641	1.623	1.737	1.952
2 - ACTUAL PRODUCTION (MLN TONS)	0.544	0.545	0.548	0.551	0.507	0.470	0.471	0.497	0.492	0.526	0.591
3 - MILL CAPACITY (MLN TPY)	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.620	0.620	0.620
4 - ESTIMATED MINE LIFE AT YEAR END	3.7	3.7	3.6	3.6	3.3	3.0	3.1	3.2	2.6	2.8	3.1
5 - ACTUAL PRODUCTION + REMAINING RESERVES	7.599	8.162	8.626	9.180	9.543	9.891	10.362	10.941	11.415	12.054	12.860
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	14.9	16.0	16.9	18.0	18.7	19.4	20.3	21.4	18.4	19.4	20.7
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	3.62	3.89	4.11	4.38	4.55	4.71	4.94	5.22	5.44	5.75	6.13

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DICKENSON MINES LTD

YEAR	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DOME MINES LTD

YEAR	1973	1974	1975	1976	1977	1978	1979	1980	1981
1 - STATED RESERVES (MLN TONS) - YEAR END	1.691	1.871	1.933	1.890	1.867	1.859	1.896	2.149	2.147
2 - ACTUAL PRODUCTION (MLN TONS)	0.682	0.702	0.708	0.708	0.686	0.679	0.664	0.678	0.557
3 - MILL CAPACITY (MLN TPY)	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725
4 - ESTIMATED MINE LIFE AT YEAR END	2.3	2.6	2.7	2.6	2.6	2.6	2.6	3.0	3.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	17.776	18.658	19.428	20.093	20.756	21.427	22.128	23.059	23.615
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	24.5	25.8	26.8	27.7	28.6	29.6	30.5	31.8	32.6
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	5.67	5.95	6.20	6.41	6.62	6.83	7.06	7.35	7.53

EAST MALARTIC MINES LTD

YEAR	1970	1971	1972	1973	1974	1975	1976	1977	1978
1 - STATED RESERVES (MLN TONS) - YEAR END	1.720	1.910	2.046	2.675	2.446	1.861	1.438	1.050	0.533
2 - ACTUAL PRODUCTION (MLN TONS)	0.521	0.582	0.550	0.561	0.517	0.561	0.599	0.621	0.595
3 - MILL CAPACITY (MLN TPY)	0.620	0.620	0.620	0.620	0.620	0.620	0.620	0.620	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	2.8	3.1	3.3	4.3	3.9	3.0	2.3	1.7	0.9
5 - ACTUAL PRODUCTION + REMAINING RESERVES	13.149	13.922	14.607	15.797	16.085	16.062	16.238	16.471	16.548
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	21.2	22.4	23.5	25.5	25.9	25.9	26.2	26.5	27.8
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	6.27	6.64	6.96	7.53	7.67	7.66	7.74	7.85	7.89

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ERICKSON GOLD MINES LTD

YEAR	1978	1979	1980	1981	1982	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.010	0.019	0.050	0.066	0.087	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.032	0.032	0.038	0.039	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.037	0.037	0.037	0.037	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.6	1.6	1.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.010	0.051	0.114	0.168	0.229	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	1.6	3.5	4.4	5.9	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	5.06	11.40	16.79	22.85	0.00	0.00	0.00	0.00	0.00	0.00

GIANT YELLOWKNIFE

YEAR	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1 - STATED RESERVES (MLN TONS) - YEAR END	1.696	1.789	3.530	3.140	2.850	2.529	2.550	2.560	2.565	2.600	2.310
2 - ACTUAL PRODUCTION (MLN TONS)	0.276	0.287	0.298	0.310	0.289	0.321	0.362	0.181	0.367	0.376	0.388
3 - MILL CAPACITY (MLN TPY)	0.300	0.300	0.300	0.300	0.300	0.300	0.365	0.366	0.365	0.365	0.365
4 - ESTIMATED MINE LIFE AT YEAR END	5.7	6.0	11.8	10.5	9.5	8.4	7.0	7.0	7.0	7.1	6.3
5 - ACTUAL PRODUCTION + REMAINING RESERVES	1.972	2.352	4.390	4.310	4.309	4.309	4.692	4.883	5.254	5.665	5.763
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	6.6	7.8	14.6	14.4	14.4	14.4	12.9	13.4	14.4	15.5	15.8
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.19	2.23	2.19	2.18	2.19	2.38	2.48	2.66	2.87	2.92

NORTHAIR MINES LTD

YEAR	1977	1978	1979	1980	1981	1982	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.331	0.243	0.215	0.111	0.064	0.067	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.067	0.104	0.103	0.097	0.078	0.067	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.091	0.091	0.091	0.091	0.091	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	3.6	2.7	2.4	1.2	0.7	0.7	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.331	0.310	0.386	0.385	0.435	0.516	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	3.6	3.4	4.2	4.2	4.8	5.7	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	0.94	1.17	1.16	1.32	1.56	0.00	0.00	0.00	0.00	0.00

CANADIAN GOLD MINES - PAGE 3

ERICKSON GOLD MINES LTD

YEAR	0	0	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GIANT YELLOWKNIFE

YEAR	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1 - STATED RESERVES (MLN TONS) - YEAR END	2.370	2.134	1.628	1.275	1.144	1.066	0.699	0.745	1.173	2.400	1.950
2 - ACTUAL PRODUCTION (MLN TONS)	0.401	0.395	0.320	0.332	0.375	0.400	0.425	0.404	0.401	0.389	0.328
3 - MILL CAPACITY (MLN TPY)	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365	0.365
4 - ESTIMATED MINE LIFE AT YEAR END	6.5	5.8	4.5	3.5	3.1	2.9	1.9	2.0	3.2	6.6	5.3
5 - ACTUAL PRODUCTION + REMAINING RESERVES	6.224	6.383	6.197	6.176	6.420	6.741	6.799	7.249	8.078	9.695	9.573
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	17.1	17.5	17.0	16.9	17.6	18.5	18.6	19.9	22.1	26.6	26.2
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	3.16	3.24	3.14	3.13	3.26	3.42	3.45	3.68	4.10	4.92	4.85

NORTHAIR MINES LTD

YEAR	0	0	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CANADIAN GOLD MINES - PAGE 3

ERICKSON GOLD MINES LTD

YEAR	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GIANT YELLOWKNIFE

YEAR	1976	1977	1978	1979	1980	1981	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	1.505	1.004	1.216	2.054	2.005	1.208	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.392	0.428	0.446	0.397	0.416	0.227	0.395	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.365	0.365	0.365	0.365	0.365	0.365	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	4.1	2.8	3.3	5.6	5.5	3.3	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	9.520	9.447	10.105	11.340	11.707	11.137	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	26.1	25.9	27.7	31.1	32.1	30.5	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	4.83	4.79	5.12	5.75	5.94	5.65	0.00	0.00	0.00

NORTHAIR MINES LTD

YEAR	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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PAMOUR PORCUPINE MINES LTD

PAMOUR MINE

YEAR	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
1 - STATED RESERVES (MLN TONS) - YEAR END	1.251	1.252	1.446	1.464	1.619	1.628	1.637	1.606	1.608	1.638	1.637
2 - ACTUAL PRODUCTION (MLN TONS)	0.582	0.611	0.627	0.637	0.636	0.619	0.629	0.647	0.637	0.646	0.648
3 - MILL CAPACITY (MLN TPY)	0.593	0.593	0.593	0.593	0.593	0.639	0.639	0.639	0.639	0.639	0.639
4 - ESTIMATED MINE LIFE AT YEAR END	2.1	2.1	2.4	2.5	2.7	2.5	2.6	2.5	2.5	2.6	2.6
5 - ACTUAL PRODUCTION + REMAINING RESERVES	1.833	2.445	3.267	3.922	4.712	5.341	5.978	6.594	7.233	7.909	8.557
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	3.1	4.1	5.5	6.6	7.9	8.4	9.4	10.3	11.3	12.4	13.4
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.33	1.78	2.14	2.57	2.91	3.26	3.60	3.95	4.32	4.67

SCHUMACHER MINE (ACQUIRED FROM MCINTYRE)

YEAR	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
1 - STATED RESERVES (MLN TONS) - YEAR END	3.286	2.835	2.651	2.557	2.530	2.519	2.392	2.263	2.126	2.009	1.752
2 - ACTUAL PRODUCTION (MLN TONS)	0.751	0.754	0.769	1.114	0.810	0.743	0.772	0.803	0.774	0.776	0.741
3 - MILL CAPACITY (MLN TPY)	0.876	0.876	0.876	0.876	0.876	0.876	0.876	0.876	0.876	0.876	0.876
4 - ESTIMATED MINE LIFE AT YEAR END	4.4	3.8	3.4	2.3	3.1	3.4	3.1	2.8	2.7	2.6	2.4
5 - ACTUAL PRODUCTION + REMAINING RESERVES	4.037	4.340	4.925	5.945	6.728	7.459	8.105	8.778	9.415	10.074	10.557
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	5.4	5.8	6.4	5.3	8.3	10.0	10.5	10.9	12.2	13.0	14.2
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.08	1.22	1.47	1.67	1.85	2.01	2.17	2.33	2.50	2.62

CANADIAN GOLD MINES - PAGE 4

PAMOUR PORCUPINE MINES LTD

PAMOUR MINE

YEAR	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
1 - STATED RESERVES (MLN TONS) - YEAR END	1.640	1.631	1.632	1.702	1.616	1.635	1.601	1.571	1.531	1.558	2.250
2 - ACTUAL PRODUCTION (MLN TONS)	0.633	0.628	0.602	0.584	0.612	0.610	0.624	0.622	0.634	0.691	0.724
3 - MILL CAPACITY (MLN TPY)	0.639	0.639	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095
4 - ESTIMATED MINE LIFE AT YEAR END	2.6	2.6	1.5	1.6	1.5	1.5	1.5	1.4	1.4	1.4	2.1
5 - ACTUAL PRODUCTION + REMAINING RESERVES	9.192	9.811	10.414	11.068	11.595	12.223	12.814	13.406	13.999	14.717	16.133
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	14.4	15.4	9.5	10.1	10.6	11.2	11.7	12.2	12.8	13.4	14.7
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	5.02	5.35	5.68	6.04	6.33	6.67	6.99	7.32	7.64	8.03	8.80

SCHUMACHER MINE (ACQUIRED FROM MCINTYRE)

YEAR	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	0
1 - STATED RESERVES (MLN TONS) - YEAR END	1.611	1.457	1.234	1.093	0.858	0.808	0.672	0.687	0.580	0.387	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.718	0.687	0.626	0.513	0.404	0.323	0.329	0.331	0.310	0.323	0.000
3 - MILL CAPACITY (MLN TPY)	0.876	0.876	0.876	0.876	0.365	0.365	0.365	0.365	0.365	0.365	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	2.2	2.1	2.0	2.1	2.1	2.5	2.0	2.1	1.9	1.2	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	11.134	11.668	12.070	12.442	12.611	12.884	13.077	13.423	13.627	13.756	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	15.5	17.0	19.3	24.3	31.2	39.8	39.7	40.6	43.9	42.7	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	2.76	2.89	2.99	3.08	3.12	3.19	3.24	3.33	3.38	3.41	0.00

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PAMOUR PORCUPINE MINES LTD

PAMOUR MINE

YEAR	1973	1974	1975	1976	1977	1978	1979	1980	1981
1 - STATED RESERVES (MLN TONS) - YEAR END	2.481	2.522	1.603	1.348	1.678	1.595	1.742	1.739	1.580
2 - ACTUAL PRODUCTION (MLN TONS)	0.877	0.860	0.904	1.015	1.178	1.188	0.932	0.980	0.712
3 - MILL CAPACITY (MLN TPY)	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	2.3	2.3	1.5	1.2	1.5	1.5	1.6	1.6	2.2
5 - ACTUAL PRODUCTION + REMAINING RESERVES	17.241	18.141	18.126	18.887	20.394	21.498	22.577	23.555	24.107
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	15.7	16.6	16.6	17.2	18.6	19.6	20.6	21.5	33.9
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	9.41	9.90	9.89	10.31	11.13	11.73	12.32	12.85	13.15

SCHUMACHER MINE (ACQUIRED FROM MCINTYRE)

YEAR	0	0	0	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PATINO, N.V.

SIGMA MINES (QUEBEC) LTD

YEAR	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
1 - STATED RESERVES (MLN TONS) - YEAR END	1.441	1.410	1.384	1.409	1.389	1.341	1.345	1.394	1.370	1.348	1.292
2 - ACTUAL PRODUCTION (MLN TONS)	0.403	0.418	0.410	0.430	0.437	0.422	0.423	0.439	0.439	0.432	0.449
3 - MILL CAPACITY (MLN TPY)	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.438	0.511	0.511
4 - ESTIMATED MINE LIFE AT YEAR END	3.3	3.2	3.2	3.2	3.2	3.1	3.1	3.2	3.1	2.6	2.5
5 - ACTUAL PRODUCTION + REMAINING RESERVES	1.844	2.231	2.615	3.071	3.487	3.861	4.288	4.776	5.191	5.601	5.994
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	4.2	5.1	6.0	7.0	8.0	8.8	9.8	10.9	11.9	11.0	11.7
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	1.00	1.21	1.42	1.67	1.89	2.09	2.33	2.59	2.82	3.04	3.25

CANADIAN GOLD MINES - PAGE 5

PATINO, N.V.

SIGMA MINES (QUEBEC) LTD

YEAR	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1 - STATED RESERVES (MLN TONS) - YEAR END	1.294	1.270	1.219	1.222	1.223	1.242	1.253	1.259	1.232	1.262	1.262
2 - ACTUAL PRODUCTION (MLN TONS)	0.472	0.497	0.491	0.511	0.510	0.520	0.521	0.498	0.497	0.499	0.496
3 - MILL CAPACITY (MLN TPY)	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.511
4 - ESTIMATED MINE LIFE AT YEAR END	2.5	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.5	2.5
5 - ACTUAL PRODUCTION + REMAINING RESERVES	6.467	6.941	7.380	7.894	8.405	8.943	9.476	9.980	10.450	10.979	11.475
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	12.7	13.6	14.4	15.4	16.4	17.5	18.5	19.5	20.5	21.5	22.5
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	3.51	3.76	4.00	4.28	4.56	4.85	5.14	5.41	5.67	5.95	6.22

CANADIAN GOLD MINES - PAGE 5

PATINO, N.V.

SIGMA MINES (QUEBEC) LTD

YEAR	1979	1980	1981	0	0	0	0	0	0
1 - STATED RESERVES (MLN TONS) - YEAR END	1.240	1.223	1.194	0.000	0.000	0.000	0.000	0.000	0.000
2 - ACTUAL PRODUCTION (MLN TONS)	0.493	0.491	0.484	0.488	0.000	0.000	0.000	0.000	0.000
3 - MILL CAPACITY (MLN TPY)	0.511	0.511	0.511	0.000	0.000	0.000	0.000	0.000	0.000
4 - ESTIMATED MINE LIFE AT YEAR END	2.4	2.4	2.3	0.0	0.0	0.0	0.0	0.0	0.0
5 - ACTUAL PRODUCTION + REMAINING RESERVES	11.947	12.421	12.876	0.000	0.000	0.000	0.000	0.000	0.000
6 - "ACTUAL" MINE LIFE FROM START OF YEAR	23.4	24.3	25.2	0.0	0.0	0.0	0.0	0.0	0.0
7 - RATIO OF CURRENT YEAR LINE 5 NUMBER TO FIRST YEAR LINE 5 NUMBER	6.48	6.74	6.98	0.00	C.00	C.00	0.00	0.00	0.00

APPENDIX IV

THE VALUATION OF MINING PROPERTIES

THE VALUATION

OF

MINING PROPERTIES

MINING LAW SEMINAR
HYATT REGENCY, VANCOUVER
APRIL 7, 1989

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THE VALUATION OF MINERAL PROPERTIES

I INTEND TO ADDRESS THE FOLLOWING TOPICS:

(1) REASONS FOR VALUATIONS

(2) LOCAL POLICY STATEMENT #3-07

(3) DEGREES OF UNCERTAINTY IN VALUATIONS

(4) FACTORS AFFECTING VALUATIONS

(5) VALUATION METHODS IN GENERAL

(6) APPLICATION OF SPECIFIC VALUATION METHODS

- OPTION TERMS
- DISCOUNTED CASH FLOW
- GOLD RATIOS

(7) NATIONAL POLICY 2A (REPORTS)

- RESERVE CLASSIFICATIONS
- METAL PRICES
- DISCOUNT RATE

(8) SUMMARY

REASONS FOR VALUATIONS

THERE ARE A VARIETY OF REASONS FOR VALUATIONS, SEVERAL OF WHICH ARE OUTLINED BELOW:

(1) PURCHASE OR SALE OF MINERAL PROPERTIES

(2) MERGERS AND AMALGAMATIONS

(3) ISSUANCE OF SHARES FOR MINERAL PROPERTIES

(4) SECURITIES COMMISSION OR STOCK EXCHANGE APPROVALS

(5) BANK LOANS OR OTHER FINANCING

(6) ESTATE VALUATIONS

(7) INCOME TAX REQUIREMENTS

(8) FAIRNESS OPINIONS

(9) EXPROPRIATIONS

(10) YEARLY AUDIT OF PERFORMANCE

(11) MINORITY SHAREHOLDER OPPRESSION

(12) STOCK MARKET FRAUD

(13) BREACH OF CONTRACT

(14) BUSINESS INTERRUPTION INSURANCE CLAIMS

(15) SHAREHOLDER/PARTNER DISPUTES

(16) FINANCIAL STATEMENT PRESENTATION

I WILL NOW REFER TO PARAGRAPH 7.2 OF LOCAL POLICY STATEMENT #3-07, WHICH ATTEMPTS TO DIFFERENTIATE BETWEEN PROPERTIES OF DETERMINATE AND INDETERMINATE VALUE. THAT PARAGRAPH IS REPRODUCED BELOW:

7.2 ACQUISITION OF PROPERTY OF DETERMINATE VALUE - FREE-TRADING VS ESCROW SHARES AS CONSIDERATION

7.2.1 SHARE CONSIDERATION - FREE TRADING SHARES

WHERE THE VALUE OF A PROPERTY HAS BEEN DETERMINED EITHER THROUGH A COMPUTATION OF PRESENT VALUE IN A TECHNICAL REPORT DEEMED SATISFACTORY BY THE SUPERINTENDENT OR BY SOME OTHER RECOGNIZED METHOD OF VALUATION, AND SUCH VALUE IS CONSIDERED REASONABLE BY THE SUPERINTENDENT, AN ISSUER MAY IN CONSIDERATION THEREFORE, ISSUE SHARES FREE OF ESCROW OR POOLING RESTRICTIONS AT A VALUE OF NOT LESS THAN 100% OF THE OFFERING PRICE TO THE PUBLIC ON THE FIRST PROSPECTUS.

7.2.2 SHARE CONSIDERATION - ESCROW SHARES

7.2.2.1 WHERE SUFFICIENT UNCERTAINTY ATTENDS THE DETERMINATION OF VALUE OF SUCH PROPERTY, SHARES ISSUED FOR SUCH PROPERTY MUST BE ESCROWED AND THE SUPERINTENDENT MUST BE SATISFIED THAT THE NUMBER OF SHARES SO ISSUED IS NOT UNCONSCIONABLE.

AS YOU CAN SEE, THE POLICY IS SOMEWHAT VAGUE AND IT GIVES THE SUPERINTENDENT OF BROKERS ULTIMATE POWER IN DECIDING WHAT IS DETERMINATE OR INDETERMINATE VALUE.

MY GENERAL COMMENTS ARE AS FOLLOWS:

1) THE COMPUTATION OF PRESENT VALUE DOES NOT NECESSARILY MEAN THE DISCOUNTED CASH FLOW APPROACH WHICH I WILL DISCUSS SHORTLY.

2) DEEMED SATISFACTORY BY THE SUPERINTENDENT LEAVES CONSIDERABLE DISCRETION WITHOUT SETTING OUT THE FACTORS THAT MAKE IT SATISFACTORY.

3) SOME OTHER RECOGNIZED METHOD OF VALUATION DOES NOT STATE THE QUALIFICATIONS FOR BEING A RECOGNIZED METHOD.

4) IS CONSIDERED REASONABLE BY THE SUPERINTENDENT AGAIN DOESN'T STATE THE FACTORS THAT WILL BE EVALUATED TO DETERMINE REASONABLENESS.

5) SUFFICIENT UNCERTAINTY IS RATHER VAGUE, BUT I WILL SHORTLY POINT OUT MY VIEWS AS TO WHEN IT IS MORE LIKELY THAT THERE IS SUFFICIENT UNCERTAINTY.

6) UNCONSCIONABLE IS ALSO RATHER DIFFICULT TO DEFINE.

I WILL NOW ATTEMPT TO SET OUT A FRAMEWORK FOR INTERPRETING "SUFFICIENT UNCERTAINTY", AND THEN I WILL ADDRESS "SOME OTHER RECOGNIZED METHOD OF VALUATION" AND "THE COMPUTATION OF PRESENT VALUE".

THE DEGREE OF UNCERTAINTY DEPENDS PARTLY ON THE STAGE OF EXPLORATION FROM HYPOTHETICAL ANALYSIS THROUGH TO A PRODUCING MINE AS SHOWN ON THE NEXT SLIDE.

1) GEOLOGIC IDEA OR CONCEPT

2) ANOMALIES

3) CLAIMS STAKED (BASED ON ANOMALY)

4) CLAIMS STAKED (BASED ON A "HOT" AREA)

5) ADDITIONAL GEOLOGICAL, GEOCHEMICAL, OR GEOPHYSICAL DATA

6) DEVELOPMENT OF A MODEL OF A TARGET DEPOSIT

7) ONE DRILL HOLE IN A MINERALIZED ZONE

8) 2 DRILL HOLES IN A MINERALIZED ZONE

9) 3 DRILL HOLES IN A MINERALIZED ZONE

10) MORE DRILL HOLES (ADDING TO INDICATED RESERVES)

11) PRELIMINARY FEASIBILITY STUDY

12) ENOUGH HOLES TO DEFINE PROVEN AND PROBABLE ORE

13) FEASIBILITY STUDY

14) FINANCING AND MARKETING TERMS CONCLUDED

15) CONSTRUCTION OF MINE/MILL

16) PRODUCING MINE

"SUFFICIENT UNCERTAINTY" IS OBVIOUSLY A SUBJECTIVE DETERMINATION, SINCE THERE ARE DEGREES OF UNCERTAINTY IN ALL VALUATIONS. HOWEVER, EARLY STAGE PROPERTIES TYPICALLY HAVE THE FOLLOWING CHARACTERISTICS:

- USUALLY A SMALL AMOUNT OF EXPLORATION COMPLETED
- USUALLY LOW VALUES
- USUALLY LESS DATA AVAILABLE
- USUALLY A WIDER RANGE OF ESTIMATES OF VALUE

CONVERSELY, MORE ADVANCED PROPERTIES HAVE THE FOLLOWING CHARACTERISTICS:

- OFTEN MILLIONS OF DOLLARS SPENT
- LARGE DATA PACKAGE AVAILABLE
- USUALLY RELATIVELY HIGH VALUES
- USUALLY LESS VARIATION IN ESTIMATES OF VALUE
- USUALLY LESS RISK (FOR EXAMPLE, A PRODUCING MINE HAS ELIMINATED THE CAPITAL COST RISK, AND HAS OPERATNG EXPERIENCE ON WHICH TO BASE OPERATING COSTS, GRADES, RECOVERIES, ETC.)

IF ONE WERE TO ATTEMPT TO CATEGORIZE THE VARIOUS STAGES AS DETERMINATE OR INDETERMINATE, THE FOLLOWING WOULD GENERALLY APPLY:

(1) TO (5) INDETERMINATE VALUE
(6) AND (7) PROBABLY INDETERMINATE VALUE
(8) AND (9) PROBABLY DETERMINATE VALUE
(10) TO (16) DETERMINATE VALUE

HOWEVER, EVEN (1) TO (7) CAN BE ASCRIBED A DETERMINATE VALUE IN SOME CASES (SUCH AS WHEN A RECENT OPTION AGREEMENT HAS BEEN SIGNED, OR WHEN THERE IS A TRULY COMPARABLE PROPERTY) AS WILL BE DISCUSSED LATER.

FACTORS THAT HELP TO DETERMINE WHETHER (6) TO (9) CAN BE IN THE DETERMINATE OR INDETERMINATE CATEGORY ARE AS SHOWN IN THE NEXT OVERHEAD.

OBVIOUSLY, THE INFLUENCE OF EACH OF THE FACTORS VARIES, DEPENDING ON THE SITUATION. IN ADDITION, THERE ARE OBVIOUSLY ELEMENTS OF SUBJECTIVITY IN THE CONSIDERATION OF THE FACTORS.

1) LOCAL GEOLOGICAL CONTROLS (SUCH AS FAULTS)

2) EXPLORATION HISTORY OF THE AREA

3) COMPARISON TO SIMILAR GEOLOGICAL SETTINGS ELSEWHERE IN THE WORLD

4) "TRACK RECORD" OF THE EXPLORATION GEOLOGISTS

5) PRESENCE OF VALUABLE MINERALS OR METALS (IN SITU, STOCKPILES, DUMPS, TAILINGS, ETC.)

6) GENERAL ACTIVITY IN THE AREA

7) STAKED, LEASED, OR FREEHOLD CLAIMS

8) MINING HISTORY OF THE REGION

9) INFRASTRUCTURE IN PLACE

10) ENVIRONMENTAL SENSITIVITIES

11) PROXIMITY TO KNOWN RESERVES

12) REMOTENESS

13) PROJECTED METAL PRICES

14) GENERAL ECONOMIC AND POLITICAL CLIMATE

15) SPECIFIC INTERESTS OF A PARTY BIDDING FOR THE PROPERTY

16) SIZE, TYPE, AND EXTENT OF ANOMALIES (COINCIDENT?)

17) SIZE OF CLAIM BLOCK

VALUATION METHODS IN GENERAL

THERE ARE A GREAT VARIETY OF VALUATION METHODS THAT HAVE BEEN UTILIZED IN THE PAST, SOME OF WHICH ARE OUTLINED BELOW:

1) DISCOUNTED CASH FLOW (DCF)
   - NET PRESENT VALUE (NPV)
   - INTERNAL RATE OF RETURN (IRR)

2) PRICE/EARNINGS MULTIPLE

3) PAYBACK PERIOD

4) MARKET VALUE OF COMPANY'S SHARES

5) "COMPARABLE" OREBODY

6) APPLYING A DISCOUNT FACTOR TO GROSS CONTAINED METAL VALUE

7) REPLACEMENT VALUE OF MINE/MILL/INFRASTRUCTURE

8) OPTION TERMS

9) BOOK VALUE

10) STATISTICAL OR PROBABILISTIC METHOD

11) MARKET PREMIUM OR DISCOUNT ON SHARE PRICE

12) VALUE PER TON OF ORE IN THE GROUND

13) PREMIUM OR DISCOUNT ON COSTS SPENT TO DATE

14) DOLLARS PER OUNCE OF ANNUAL GOLD PRODUCTION

15) DOLLARS PER OUNCE OF GOLD RESERVES

16) STAKING COSTS

17) OPTIONS PRICING MODEL

SINCE THE DISCOUNTED CASH FLOW APPROACH IS GENERALLY THE PREFERRED VALUATION METHOD WHERE IT CAN BE APPLIED, I WILL DISCUSS THE OTHER METHODS FIRST. MANY OF THE OTHERS ARE OF NO VALUE, WHILE SOME CAN GIVE INDICATIONS OF VALUE (TESTS OF REASONABLENESS)

PRICE/EARNINGS MULTIPLE

- ESTIMATE EARNINGS AND MULTIPLY BY A PRICE/EARNINGS (P/E) MULTIPLE
- ONLY USEFUL FOR AN ADVANCED PROPERTY OR PRODUCING MINE OR COMPANY
- AFFECTED BY BOOK ITEMS, SUCH AS AMORTIZATION AND DEPRECIATION, WHICH DO NOT AFFECT THE CASH FLOW
- METHOD IS ACCEPTABLE, BUT NOT AS GOOD AS THE DISCOUNTED CASH FLOW APPROACH

PAYBACK PERIOD

- DETERMINES WHEN ALL YOUR INVESTMENT IS REPAID
- IGNORES THE IMPACT OF CASH FLOW IN LATER YEARS
- FOR EXAMPLE, YOU COULD INVEST 100 MILLION AND DEMAND A 4 YEAR PAYBACK. HOWEVER YOUR RETURNS COULD BE 20 MILLION A YEAR FOR 4 YEARS (WHICH DOESN'T PAYBACK IN 4 YEARS) AND THEN 200 MILLION IN YEAR 5. THE ARBITRARY APPLICATION OF THE PAYBACK METHOD WOULD ELIMINATE THIS GOOD INVESTMENT
- IN ADDITION, PAYBACK METHOD IGNORES THE TIME VALUE OF MONEY (INTEREST)
- USEFUL WHEN INVESTING IN POLITICALLY UNSTABLE AREAS

MARKET VALUE OF SHARES

- MULTIPLY THE PRICE PER SHARE BY THE NUMBER OF ISSUED SHARES
- ONLY APPLICABLE IF LISTED ON A PUBLIC SHARE EXCHANGE
- ONLY APPLICABLE IF THE COMPANY'S MAJOR ASSET IS THE PROPERTY TO BE VALUED
- IN ADDITION, THE PRICE OF A FEW SHARES SOLD IS NOT NECESSARILY REFLECTIVE OF WHAT YOU COULD SELL ALL THE SHARES FOR
- CAN GIVE AN INDICATION OF VALUE

COMPARABLE OREBODY

- ESTABLISH A VALUE BASED ON A KNOWN TRANSACTION PRICE OF A COMPARABLE OREBODY
- IN MINING, UNLIKE IN OIL AND GAS, THERE ARE FEW, IF ANY, TRULY COMPARABLES
- EACH OREBODY IS UNIQUE WITH REGARD TO GEOLOGY, COSTS, INFRASTRUCTURE, ETC.

GROSS CONTAINED METAL VALUE TIMES A DISCOUNT FACTOR

- LITTLE NEED BE SAID THAT THIS METHOD IS OF NO VALUE
- VALUE DEPENDS ON THE RELATIONSHIP BETWEEN REVENUE AND COSTS

REPLACEMENT VALUE

- WHAT IT COSTS TO BUILD A MINE/MILL COMPLEX IS NOT RELEVANT TO THE VALUE OF A PARTICULAR DEPOSIT.
- THE MINE/MILL COMPLEX ONLY HAS VALUE INSOFAR AS IT ENABLES ONE TO GENERATE CASH FLOW
- ONLY THE SALVAGE OR DISPOSAL VALUE IS RELEVANT IF YOU CANNOT GENERATE CASH FLOW

OPTION TERMS

- ONE CAN DETERMINE THE COMMITTED FUTURE EXPENDITURES AND CASH PAYMENTS BY AN OPTIONOR TO EARN AN INTEREST IN A PROPERTY. THESE EXPENDITURES AND PAYMENTS CAN THEN BE DISCOUNTED TO PRESENT DAY DOLLARS AND ADJUSTED FOR THE PERCENTAGE EQUITY BEING EARNED IN ORDER TO CALCULATE THE VALUE TO BE ASCRIBED TO THE OPTIONEE'S REMAINING INTEREST IN THE PROPERTY. THIS IS A MINIMUM VALUE, SINCE THERE ARE OFTEN OPTIONAL ADDITIONAL PAYMENTS AND/OR EXPENDITURES TO EARN AN INTEREST. THESE ADDITIONAL PAYMENTS OR EXPENDITURES MUST BE REDUCED BY NOT ONLY THE DISCOUNT RATE TO EQUATE TO PRESENT DAY DOLLARS, BUT ALSO BY A PROBABILITY OF CONTINUING THE PROGRAM

BOOK VALUE

- FOR EXPLORATION COMPANIES THAT CAPITALIZE EXPLORATION COSTS UNTIL A PRODUCTION OR ABANDONMENT DECISION, THIS METHOD IS OF LITTLE VALUE.
- YOU MAY HAVE UNWISELY SPENT EXPLORATION DOLLARS, YET THEY APPEAR ON YOUR BOOKS AS ASSETS
- CONVERSELY, YOU MAY HAVE SPENT VERY FEW DOLLARS, BUT HAVE A VERY VALUABLE OREBODY

STATISTICAL OR PROBABILISTIC METHOD

- THIS METHOD IS BASED ON A STATISTICAL ANALYSIS OF THE AVERAGE VALUE OF AN ECONOMIC DEPOSIT (MINE) AND THE CHANCE OF DISCOVERIES BECOMING ECONOMIC AND OF ANOMALIES (DRILL TARGETS) BECOMING DISCOVERIES
- METHOD IS SOMEWHAT SUBJECTIVE, AND IS BETTER SUITED TO VALUING EXPLORATION PROPERTIES AT AN EARLY STAGE (BEFORE AN OREBODY IS ESTABLISHED)

MARKET PREMIUM OR DISCOUNT ON SHARE PRICE

- THIS METHOD APPLIES A PREMIUM OR DISCOUNT TO A MARKET PRICE OF A SHARE
- METHOD IS SUBJECTIVE, BUT HISTORICAL PREMIUMS AND DISCOUNTS (BASED ON ACQUISITIONS) CAN BE USED AS A GUIDE TO VALUE

VALUE PER TON OF ORE IN THE GROUND

- THIS METHOD IS EXTREMELY ARBITRARY SINCE THE MATERIAL IN THE GROUND HAS NO VALUE UNTIL YOU ESTABLISH THE RELATIONSHIP BETWEEN GRADE, RECOVERY, METAL PRICES, COSTS, ETC.

COSTS SPENT TO DATE

- THIS METHOD SAYS A PROPERTY IS WORTH WHAT HAS BEEN SPENT ON IT PLUS A PREMIUM IF THE RESULTS ARE GOOD, OR A DISCOUNT IF RESULTS ARE POOR
- FIRSTLY, EXPENDITURES ON A PROPERTY ARE NOT INDICATIVE OF VALUE
- SECONDLY, ANY PREMIUM OR DISCOUNT IS ARBITRARY
- HOWEVER, THERE IS SOME CORRELATION BETWEEN COSTS AND RESULTS

DOLLARS PER OUNCE OF ANNUAL GOLD PRODUCTION

- THIS METHOD IS DISCUSSED LATER UNDER THE HEADING "GOLD RATIOS"

DOLLARS PER OUNCE OF GOLD RESERVES

- THIS METHOD IS ALSO DISCUSSED LATER UNDER THE HEADING "GOLD RATIOS"

STAKING COSTS

- STAKING COSTS PER UNIT OR PER CLAIM ARE OFTEN USED AS AN INDICATION OF A MINIMUM VALUE

OPTIONS PRICING MODEL

- THE OPTIONS PRICING MODEL TREATS A MINE OR PROPERTY AS AN OPTION, AND AS SUCH THE MINE OR PROPERTY HAS A VALUE GREATER THAN ZERO EVEN IF IT IS UNECONOMIC AT THE PRESENT TIME. SOME OPTIONS ARE AS FOLLOWS:

  FOR EXPLORATION PROPERTIES

  . OPTION TO EXPLORE, DROP, OR HOLD PROPERTY
  . OPTION TO PUT INTO PRODUCTION
  . OPTION TO SELL OR LEASE

  FOR PRODUCING PROPERTIES

  . OPTION TO INCREASE OR DECREASE PRODUCTION
  . OPTION TO SHUT DOWN OR RE-OPEN
  . OPTION TO HEDGE PRODUCTION
  . OPTION TO CHANGE COST STRUCTURE (CHANGE CUT-OFF GRADE)

- BECAUSE THE ABOVE OPTIONS HAVE VALUE, THE DISCOUNTED CASH FLOW VALUE, AS WILL BE DISCUSSED SUBSEQUENTLY IS OFTEN A MINIMUM VALUE. FOR MARGINAL PROPERTIES, THE OPTION VALUE IS A SIGNIFICANT PORTION OF THE TOTAL VALUE

NOW I WILL ADDRESS SOME SPECIFIC VALUATION METHODS, THE FIRST BEING "OPTION TERMS":

OPTION TERMS

AS STATED EARLIER, ONE CAN DETERMINE THE COMMITTED FUTURE EXPENDITURES AND CASH PAYMENTS BY AN OPTIONOR TO EARN AN INTEREST IN THE PROPERTY. THESE EXPENDITURES CAN THEN BE DISCOUNTED TO PRESENT DAY DOLLARS AND ADJUSTED FOR THE PERCENTAGE EQUITY BEING EARNED IN ORDER TO CALCULATE THE VALUE TO BE ASCRIBED TO THE OPTIONEE'S REMAINING INTEREST IN THE PROPERTY. THIS IS A MINIMUM VALUE, SINCE THERE ARE OFTEN OPTIONAL ADDITIONAL PAYMENTS AND/OR EXPENDITURES TO EARN AN INTEREST. THESE ADDITIONAL PAYMENTS OR EXPENDITURES MUST BE REDUCED BY NOT ONLY THE DISCOUNT RATE TO EQUATE TO PRESENT DAY DOLLARS, BUT ALSO BY A PROBABILITY OF CONTINUING THE PROGRAM

EXAMPLE:

OPTIONOR AGREES TO PAY $20,000 NOW, AND COMMITS TO $200,000 OF EXPENDITURES OVER THE NEXT YEAR, AND HAS THE OPTION OF PAYING $40,000 IN ONE YEAR AND MAKING EXPENDITURES OF $300,000 OVER THE SECOND YEAR TO EARN A 60% INTEREST

THE MINIMUM VALUE, BASED ON COMMITMENTS, WOULD BE CALCULATED AS FOLLOWS:

	PRESENT VALUE
$20,000 PAYMENT	$ 20,000
SINCE $20,000 PAYED FOR 60%, VALUE ATTRIBUTED TO THE RESIDUAL 40% = $\frac{40}{60}$ x $20,000	13,300
$200,000 EXPLORATION x 40% CARRIED x .93 (TIMING)	74,400
MINIMUM DETERMINATE VALUE =	$107,700

THE ADDITIONAL VALUE, BASED ON AN ASSUMED 50% CHANCE OF MAKING THE $40,000 PAYMENT AND A 40% CHANCE OF COMPLETING A FURTHER $300,000 EXPLORATION PROGRAM, WOULD BE CALCULATED AS FOLLOWS:

$40,000 PAYMENT x 50% x .87 (TIMING)	$ 17,400
SINCE $17,400 PAYED FOR 60%, VALUE ATTRIBUTED TO THE RESIDUAL 40% = $\frac{40}{60}$ x 17,400	11,600
$300,000 EXPLORATION x 40% x 40% CARRIED x .81 (TIMING)	38,900
ADDITIONAL "INDETERMINATE" VALUE =	$ 67,900
TOTAL ESTIMATED VALUE =	$175,000

THE NEXT SPECIFIC VALUATION METHOD IS THE DISCOUNTED CASH FLOW APPROACH, MOST COMMONLY USED FOR VALUING RELATIVELY ADVANCED PROJECTS.

DISCOUNTED CASH FLOWS REQUIRE PROJECTIONS OF ALL REVENUES AND COSTS (CAPITAL/OPERATING/TAXES/ROYALTIES/ETC.) AND DISCOUNTING OF THE DIFFERENCE AT THE APPROPRIATE RATE (I WILL DISCUSS THIS LATER, SINCE THIS IS A KEY FACTOR).

NOTE THE FACTORS REQUIRED IN ORDER TO PREPARE A DCF (AS PER THE NEXT PAGE). THESE FACTORS ARE MORE OR LESS PRECISE DEPENDING ON THE STAGE OF A MINERAL PROPERTY EVALUATION. SOME OF THESE STAGES ARE:

- PRELIMINARY ECONOMIC ANALYSIS (ORDER-OF-MAGNITUDE STUDY)
- DETAILED EXPLORATION PROGRAM (TO FILL IN HOLES IDENTIFIED BY PRELIMINARY ECONOMIC ANALYSIS)
- DETAILED FEASIBILITY STUDY
- DETAILED ENGINEERING DESIGN
- MINE DEVELOPMENT
- MINE AND MILL CONSTRUCTION
- MINE AND MILL OPERATION

IT SHOULD BE NOTED THAT THE DEPTH OR DETAIL OF A VALUATION REPORT DEPENDS UPON THE REQUIREMENTS OF THE DECISION-MAKING BODY SEEKING THE ESTIMATE: LARGE SHAREHOLDER, CORPORATE MANAGEMENT (INTERNAL), BANK OR LENDING INSTITUTION, PUBLIC FINANCING, OR REGULATORY BODY, ETC.

EVALUATING MINERAL PROPERTIES

- GEOLOGY AND MINERAL INVENTORY
- MINING AND MINABLE ORE RESERVES
- METALLURGY - RESEARCH
- METALLURGY - DESIGN
- ANCILLARY SERVICES
- CAPITAL COSTS
- OPERATING COSTS
- MARKETING
- RIGHTS, OWNERSHIP
- ENVIRONMENTAL IMPACT
- SOCIO-ECONOMIC IMPACT
- FINANCIAL AND TAX MATTERS

THE PRECEEDING ARE JUST A FEW OF DOZENS OF INPUT ASSUMPTIONS THAT HAVE TO BE ESTIMATED. THUS A DCF MAY BE DETERMINATE IN THE BROAD SENSE, BUT IT IS FAR FROM PRECISE. THERE ARE A HOST OF RISK FACTORS AS SHOWN BELOW:

RISK FACTORS

- GRADE AND TONS INCORRECTLY ESTIMATED (ONE ERROR WAS AN INCORRECT SPECIFIC GRAVITY)
- DILUTION NOT CONSIDERED
- MINING RECOVERY INCORRECTLY ESTIMATED
- GROUND CONDITIONS POORER THAN ESTIMATED
- WATER CONDITIONS POORER THAN ESTIMATED
- CAPITAL AND OPERATING COSTS UNDERESTIMATED
- INADEQUATE ALLOWANCE FOR WORKING CAPITAL
- START-UP LEARNING CURVE OVERLOOKED
- METALLURGICAL RECOVERY ESTIMATE TOO HIGH
- METAL PRICES AND SMELTER TERMS INCORRECTLY ESTIMATED

OTHER FACTORS WHICH ARE OFTEN INCORRECTLY TREATED IN DCF VALUATIONS ARE AS FOLLOWS:

(1) INFLATED OR CONSTANT DOLLARS (THE DISCOUNT RATE MUST BE HIGHER IF YOU USE INFLATED DOLLARS)
(2) 100% EQUITY FINANCED OR LEVERAGED WITH DEBT. THE LEVERAGED RETURN IS MORE RISKY, SO USE A HIGHER DISCOUNT RATE.
(3) DIFFERENT COMMODITIES HAVE DIFFERENT RISK AND REQUIRE DIFFERENT DCF RATES (I WILL SAY MORE ABOUT THIS LATER). IN GENERAL, CONSUMABLE COMMODITIES SUCH AS COPPER, LEAD, AND ZINC HAVE HIGHER DISCOUNT RATES APPLICABLE THAN MONETARY BASED METALS LIKE GOLD AND SILVER
(4) THE RISK OF ACHIEVING HIGHER PRICES IS GREATER, SO USE A HIGHER RATE WITH HIGHER PRICES SINCE THE DCF RATE IS NOT INDEPENDENT OF PRICES
(5) INTEREST RATE COMMENSURATE WITH INFLATION RATE AND DISCOUNT RATE

I WILL NOW PRESENT A SIMPLE EXAMPLE:

EXAMPLE

	0	1	2	3	4	5
REVENUE	0	100	100	80	80	80
OPERATING COSTS	0	50	50	50	50	50
CAPITAL COSTS	150	0	0	0	0	0
TAXES		0	0	0	10	10
NET CASH FLOW	(150)	50	50	30	20	20

CUMULATIVE NPV AT 0% = $20.0

5% FACTOR	.952	.907	.864	.823	.784	.746
DCF	(142.8)	45.4	43.2	24.7	15.7	14.9

CUMULATIVE NPV AT 5% = $1.1

10% FACTOR	.909	.826	.751	.683	.621	.564
DCF	(136.4)	41.3	37.6	20.5	12.4	11.3

CUMULATIVE NPV AT 10% = (13.3)

THIS EXAMPLE SHOULD BE KEPT IN MIND WHEN WE DISCUSS RESERVES AND DISCOUNT RATE REQUIRED BY THE ONTARIO SECURITIES COMMISSION.

OTHER VALUATION METHODS ARE COMMONLY USED BY MINING ANALYSTS FOR GOLD PROPERTIES.

METHODS OF VALUING GOLD PROJECTS

1) PRICE/EARNINGS RATIO

OFTEN 10 TO 20 x EARNINGS

- BUT ADJUST FOR SHORT MINE LIFE AND DIFFERENCES IN OPERATING COST STRUCTURES

2) $ PER OUNCE/OF ANNUAL GOLD PRODUCTION

OFTEN US $1000 TO US $2000 PER ANNUAL OUNCE

- ADJUST FOR HIGH COST OPERATION AS WELL AS OTHER FACTORS

3) $/OUNCE OF RESERVES

OFTEN GREATER THAN US $100 PER OUNCE

- ADJUST FOR OPERATING COST STRUCTURE
- ADJUST FOR METALLURGICAL RECOVERY AND CUTOFF GRADE

NOW I WOULD LIKE TO COMPARE THE VARIOUS VALUATION METHODS THAT I HAVE PRESENTED TO THE REQUIREMENTS OF NATIONAL POLICY 2A AND, IN PARTICULAR, THE O.S.C.

(III) EVEN 3 HOLES OF 50' OF 1 OUNCE GOLD WOULD HAVE NO VALUE ACCORDING TO OSC GUIDELINES, SINCE NO ORE IS PROVEN OR PROBABLE. YET SUCH HOLES ARE 3 OR 4 TIMES AS GOOD AS THOSE TYPICAL OF THE HEMLO DEPOSIT

(IV) HOWEVER "POSSIBLE RESERVES" MUST BE DEFINED BY "GOOD ENGINEERING PRINCIPLES" AND NOT JUST A STATEMENT THAT "ANYTHING IS POSSIBLE"

(V) FOR A NEW PROJECT THE NPV COULD BE $1.1 MILLION WITH PROVEN AND PROBABLE RESERVES (SEE PREVIOUS EXAMPLE), BUT IF YOU ADD JUST 20% TO THE RESERVES (1 YEAR) THE VALUE INCREASES TO $15.3 MILLION. THAT IS, THE VALUE IS ALMOST 15 x AS GREAT AS BEFORE. PEOPLE THAT EXPECT TO DOUBLE THE RESERVES MIGHT PAY $50 MILLION FOR THIS PROPERTY, WHICH WOULD BE VALUED AT CLOSE TO ZERO BY THE O.S.C.

OBVIOUSLY, COMPANIES ARE NOT GOING TO LIST THEIR ASSETS ON THE TSE IF THEY CANNOT GET FAIR MARKET VALUE ASCRIBED TO THEM

THE CHANGE IN DCF IS NOT AS CRITICAL FOR PROPERTIES WHERE THE CAPITAL HAS ALREADY BEEN SPENT. IN THE PREVIOUS EXAMPLE IF $150 MILLION HAD ALREADY BEEN SPENT THE DCF'S WOULD BE AS FOLLOWS:

0% = $170.0 MILLION
5% = $143.9 MILLION
10% = $133.1 MILLION

2. METAL PRICES

METAL PRICES REQUIRED BY THE O.S.C. ARE TODAY'S PRICES, WITH NO INFLATION OF PRICES OR COSTS. THIS IS TOTALLY INAPPROPRIATE FOR GOLD PRICES WHERE ONE CAN SELL FORWARD AT PRICES 3% TO 5% ABOVE THE PROJECTED INFLATION RATE. IN ADDITION, I WOULD NOT USE A $1.50 U.S. COPPER PRICE FOR THE NEXT 10 YEARS.

THE O.S.C. WILL NOT ALLOW PRICE INCREASES FOR GOLD, YET THEY WILL NOT ALLOW $1.50 PER POUND COPPER. THEY ARE THUS INCONSISTENT AND BIASED TO THE LOW SIDE WHICH COULD HARM EXISTING SHAREHOLDERS JUST AS MUCH AS BEING TOO OPTIMISTIC.

3. DISCOUNT RATE

THE O.S.C. REQUIRES THE USE OF A 10% REAL AFTER-TAX DISCOUNT RATE FOR ALL COMMODITIES. HOWEVER, AS I WILL SHOW YOU SHORTLY, THIS IS COMPLETELY INAPPROPRIATE. THE DISCOUNT RATE MUST BE RELATED TO THE COMMODITY, THE COST OF PRODUCTION (IE, IF IN LOWER 1/2 OF THE COST CURVE, LESS CHANCE OF PRICE DECREASING TO THE COST LEVEL), AND THE METAL PRICE USED.

I WILL NOW DISCUSS GOLD PROPERTIES. MARKET EVIDENCE SUGGESTS THAT A 10% REAL AFTER-TAX DISCOUNT RATE IS MUCH TOO HIGH FOR GOLD PROPERTIES. GOLD EARNS NO INCOME AND TODAY'S PRICE IS THE NET PRESENT VALUE OF FUTURE INCREASES. LET'S LOOK AT SOME OF THE EVIDENCE AS PRESENTED IN THE NEXT TWO OVERHEADS.

BACK TO OUR PREVIOUS EXAMPLE

AT A 10% DCF RATE AND 5 YEARS RESERVES, THE VALUE IS NEGATIVE $13.3 MILLION. HOWEVER, THE MARKET COULD VALUE THAT PROPERTY AT $20 MILLION IF IT FELT THERE WOULD BE SOME ADDITIONAL RESERVES, AND PROBABLY OVER 50 MILLION WITH THE EXPECTATION OF SUBSTANTIAL ADDITIONAL RESERVES.

OFTEN ANALYSTS SAY THAT AN EXPLORATION PROJECT IS RISKY SO THEY USE A 20% OR HIGHER RATE. SINCE VERY FEW PROJECTS GIVE A POSITIVE VALUE AT A 20% REAL AFTER-TAX RATE (SAY 50% PRE-TAX WITH 5% INFLATION AND 50% TAX RATE), THE RESULT WILL BE ZERO AND THE PROJECT WILL BE DROPPED. HOWEVER, AT 10% OR 5% RATES THE VALUES MIGHT BE $20 MILLION AND $40 MILLION, RESPECTIVELY. IF THERE IS A 25% CHANCE OF ACHIEVING THE RESULTS, THE VALUES ARE $5 TO $10 MILLION, NOT ZERO.

DISCOUNT RATE FOR GOLD PROPERTIES

1. P/E RATIOS OF 10 (TO 20) TO 1

   CONVERSE IS RETURN OF 10% (TO 5%) IN PERPETUITY

   OR 0% TO 5% REAL (WITH TODAY'S 5% INFLATION RATE)

2. GOLD LOANS OF 2% TO 3%

3. WEIGHTED AVERAGE COST OF CAPITAL (DEBT AND EQUITY) OF 5% REAL

4. ARTICLES BY MINING ANALYSTS, ACADEMICS, AND MINING EXECUTIVES

5. FORWARD SALES AT A PRICE 3% TO 5% ABOVE THE PROJECTED INFLATION RATE

6. RATES USED BY MAJOR GOLD MINING COMPANIES

7. RATIOS FOR PRODUCING MINES AT 0%, 5%, 10%, 15% DCF RATES

PRODUCING GOLD MINES (50 NORTH AMERICAN GOLD PRODUCERS)

VALUE BASED ON MARKET CAPITALIZATION	100%
VALUE BASED ON DCF (0% DISCOUNT RATE)	87%
VALUE BASED ON DCF (5% DISCOUNT RATE)	71%
VALUE BASED ON DCF (10% DISCOUNT RATE)	58%
VALUE BASED ON DCF (15% DISCOUNT RATE)	47%

		PERCENTAGE INCREASE
"CONVENTIONAL" 15% RATE	= x	0
VALUE @ 10% RATE	= 1.25 x	+ 25%
VALUE @ 5% RATE	= 1.52 x	+ 52%
VALUE @ 0% RATE	= 1.87 x	+ 87%
MARKET VALUE (SHARE PRICE)	= 2.14 x	+114%

CONCLUSIONS

1. THERE ARE MANY VALUATION METHODS, BUT MOST ARE NOT APPLICABLE TO MINERAL PROPERTIES

2. THE STAGE OF EXPLORATION OR DEVELOPMENT OF A PROPERTY INFLUENCES THE METHOD OF VALUATION AND THE "CERTAINTY" OF THE VALUATION

3. EVEN EARLY STAGE (GRASS ROOTS) PROPERTIES CAN HAVE DETERMINATE VALUE IN SOME CASES

4. ALL VALUATIONS OF MINERAL PROPERTIES ARE IMPRECISE, AND ARE MERELY ESTIMATES USING BEST JUDGEMENTS OF MANY INPUT FACTORS AT THE TIME

5. VALUATIONS CHANGE THROUGH TIME DUE TO CHANGING EXTERNAL ENVIRONMENT (GENERAL ECONOMY, METAL PRICES, AND TECHNOLOGY) AND TO ADDITIONAL INFORMATION ABOUT AN OREBODY

6. NATIONAL POLICY 2A IS NOT REALISTIC WITH RESPECT TO VALUATIONS DUE TO:

   (I) DISALLOWANCE OF POSSIBLE RESERVES
   (II) REQUIREMENT FOR CURRENT PRICE INPUTS
   (III) REQUIREMENT FOR ONE DISCOUNT RATE FOR ALL SITUATIONS

7. DISCOUNT RATE FOR GOLD PROPERTIES SHOULD BE MUCH LOWER THAN THAT FOR NON-MONETARY COMMODITIES (OR CONSUMABLE COMMODITIES) SUCH AS Cu, Pb, Zn, ETC.

8. THE DCF METHOD IS AN APPROPRIATE METHOD TO USE, BUT THERE IS NOT AN ALL ENCOMPASING FORMULA. ONE MUST USE JUDGEMENT, BACKED-UP BY MARKET EVIDENCE

APPENDIX V

EVALUATION OF MINERAL EXPLORATION PROPERTIES

EVALUATION OF MINERAL EXPLORATION PROPERTIES

PRESENTED BY

ROSS GLANVILLE

AT THE

NORTHWEST MINING CONVENTION

SPOKANE, WASHINGTON

DECEMBER 6, 1990

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EVALUATION OF MINERAL EXPLORATION PROPERTIES

MY TOPIC THIS MORNING IS THE EVALUATION OF EXPLORATION PROPERTIES. BY EXPLORATION PROPERTIES, I MEAN THOSE PROPERTIES PRIOR TO THE POINT WHERE RESERVES HAVE BEEN INDICATED. CONSEQUENTLY, VALUATION TECHNIQUES SUCH AS THE DISCOUNTED CASH FLOW APPROACH OR PRICE EARNINGS MULTIPLES CANNOT BE APPLIED. AS A RESULT, OTHER METHODS MUST BE UTILIZED TO DETERMINE FAIR MARKET VALUES OF THESE EXPLORATION PROPERTIES. I WILL DISCUSS SOME OF THESE METHODS AND PROVIDE EXAMPLES OF THEIR APPLICATION.

BY FAIR MARKET VALUE, I MEAN THE HIGHEST PRICE EXPRESSED IN MONEY OBTAINABLE IN AN OPEN AND UNRESTRICTED MARKET BETWEEN KNOWLEDGEABLE, PRUDENT, AND WILLING PARTIES DEALING AT ARM'S LENGTH, WHO ARE FULLY INFORMED AND NOT UNDER COMPULSION TO TRANSACT.

THERE ARE A VARIETY OF REASONS FOR DETERMINING FAIR MARKET VALUE, SOME OF WHICH ARE SHOWN ON THE NEXT PAGE.

REASONS FOR VALUATIONS

(1) PURCHASE OR SALE OF MINERAL PROPERTIES

(2) MERGERS AND AMALGAMATIONS

(3) ISSUANCE OF SHARES FOR MINERAL PROPERTIES

(4) SECURITIES COMMISSION OR STOCK EXCHANGE APPROVALS

(5) FINANCINGS

(6) ESTATE VALUATIONS

(7) INCOME TAX REQUIREMENTS

(8) FAIRNESS OPINIONS

(9) EXPROPRIATIONS

(10) YEARLY PERFORMANCE AUDITS

(11) MINORITY SHAREHOLDER OPPRESSION

(12) STOCK MARKET FRAUD

(13) BREACH OF CONTRACT

(14) SHAREHOLDER/PARTNER DISPUTES

(15) FINANCIAL STATEMENT PRESENTATION

THE APPLICABILITY OF SEVERAL OF THE METHODS FOR VALUING MINERAL PROPERTIES DEPENDS UPON THE STAGE, OR STATUS, OF THE PROPERTY FROM INITIAL EXPLORATION THROUGH TO PRODUCTION. SOME OF THESE STAGES ARE OUTLINED BELOW:

1) REGIONAL PROGRAM

2) CLAIMS STAKED (BASED ON "HOT" AREA)

3) ANOMALIES DEVELOPED

4) CLAIMS STAKED (BASED ON ANOMALIES)

5) DEVELOPMENT OF A MODEL FOR A TARGET DEPOSIT

6) ADDITIONAL GEOLOGICAL, GEOCHEMICAL OR GEOPHYSICAL DATA

7) ONE OR TWO DRILL HOLES IN A MINERALIZED ZONE

8) THREE OR MORE DRILL HOLES TO DEFINE THE GEOMETRY OF MINERALIZATION

9) ADDITIONAL DRILL HOLES FOR ESTABLISHING INFERRED RESERVES

10) EXPLORATORY DEVELOPMENT

11) ENOUGH HOLES TO DEFINE PROVEN, PROBABLE AND POSSIBLE ORE

12) PRELIMINARY FEASIBILITY STUDY

13) FEASIBILITY STUDY

14) CONSTRUCTION OF MINE/MILL

15) PRODUCING MINE

FOR PURPOSES OF THIS TALK, I WILL ONLY BE REFERRING TO THOSE EXPLORATION PROPERTIES FROM 1 TO 9. THESE "EARLY-STAGE" PROPERTIES TYPICALLY HAVE THE FOLLOWING CHARACTERISTICS:

- RELATIVELY SMALL AMOUNTS OF EXPLORATION COMPLETED
- LESS "HARD DATA" (SUCH AS DRILL RESULTS) AVAILABLE
- INTERPRETATIONs AND OPINIONS HAVE A LARGE IMPACT ON VALUES
- WIDER RANGE OF ESTIMATES OF VALUE
- RELATIVELY LOW VALUES (100'S OF THOUSANDS OF DOLLARS AS OPPOSED TO 100'S OF MILLIONS OF DOLLARS)

THESE EARLY-STAGE EXPLORATION PROPERTIES ARE THE MOST DIFFICULT TO PUT A VALUE ON AND, IN MANY CASES, THERE IS A SUBSTANTIAL ELEMENT OF SUBJECTIVITY IN THE RESULTING VALUE. HOWEVER, A VALUE OFTEN MUST BE DETERMINED, PREFERABLY BY A PERSON OR GROUP THAT HAS HAD CONSIDERABLE EXPERIENCE IN:

1) MINERAL PROPERTY TRANSACTIONS
2) MINERAL EXPLORATION/ENGINEERING
3) FINANCIAL MARKETS
4) STOCK MARKETS
5) COMMODITY MARKETS

SOME OF THE FACTORS THAT INFLUENCE THE VALUATION OF MINERAL PROPERTIES, ESPECIALLY AT THE EARLIER STAGES, ARE AS FOLLOWS:

1) LOCAL GEOLOGICAL CONTROLS (SUCH AS FAULTS, OR SPECIFIC STRATA)

2) SIZE, TYPE, AND EXTENT OF ANOMALIES (COINCIDENT?)

3) PRESENCE OF VALUABLE MINERALS OR METALS (IN SITU, STOCKPILES, DUMPS, TAILINGS, ETC.)

4) EXPLORATION HISTORY OF THE AREA OR DEPOSIT TYPE

5) COMPARISON TO SIMILAR GEOLOGICAL SETTINGS ELSEWHERE IN THE WORLD

6) GENERAL ACTIVITY IN THE AREA

7) STAKED, LEASED, OR FREEHOLD CLAIMS

8) SIZE OF CLAIM BLOCK

9) MINING HISTORY OF THE REGION

10) INFRASTRUCTURE IN PLACE

11) ENVIRONMENTAL SENSITIVITIES

12) PROXIMITY TO KNOWN RESERVES

13) REMOTENESS

14) PROJECTED METAL PRICES

15) GENERAL ECONOMIC AND POLITICAL CLIMATE

16) SPECIFIC INTERESTS OF A PARTY BIDDING FOR THE PROPERTY

VALUATION METHODS IN GENERAL

THERE ARE A GREAT VARIETY OF VALUATION METHODS THAT HAVE BEEN UTILIZED IN THE PAST, SOME OF WHICH ARE LISTED BELOW. SEVERAL OF THESE METHODS, HOWEVER, CANNOT BE APPLIED TO EARLY-STAGE EXPLORATION PROPERTIES, AND SEVERAL OTHERS ARE OF LITTLE OR NO HELP IN VALUING ANY PROPERTY.

1) STAKING COSTS

2) PREMIUM OR DISCOUNT ON EXPENDITURES TO DATE

3) BOOK VALUE FROM FINANCIAL STATEMENTS

4) STATISTICAL OR PROBABILISTIC METHOD

5) OPTION TERMS

6) MARKET CAPITALIZATION OF A COMPANY

7) "COMPARABLE" PROPERTY

8) HISTORICAL COSTS PLUS BUDGETTED EXPENDITURES FOR THE NEXT PROGRAM

9) GROSS CONTAINED METAL VALUE LESS A DISCOUNT FACTOR

10) VALUE PER TON OF "ORE" IN THE GROUND

11) DISCOUNTED CASH FLOW (DCF)
    - NET PRESENT VALUE (NPV)
    - INTERNAL RATE OF RETURN (IRR)

12) ADJUSTED DCF METHOD

13) PRICE/EARNINGS MULTIPLE

14) PAYBACK PERIOD

15) REPLACEMENT VALUE OF MINE/MILL/INFRASTRUCTURE

16) DOLLARS PER OUNCE OF ANNUAL GOLD PRODUCTION

17) DOLLARS PER OUNCE OF GOLD RESERVES

18) OPTIONS PRICING MODEL

FOLLOWING ARE SOME BRIEF COMMENTS ON THE VALUATION METHODS:

1. STAKING COSTS

- STAKING COSTS PER UNIT OR PER CLAIM ARE OFTEN USED AS AN INDICATION OF A MINIMUM VALUE

- HOWEVER, STAKING COSTS DO NOT REFLECT UNDERLYING VALUE (FOR EXAMPLE, IF REMOTENESS IS CONSIDERED, THERE MIGHT BE AN INVERSE RELATIONSHIP BETWEEN STAKING COST AND VALUE)

2. PREMIUM OR DISCOUNT ON COSTS SPENT TO DATE

- THIS METHOD SAYS A PROPERTY IS WORTH WHAT HAS BEEN SPENT ON IT PLUS A PREMIUM IF THE RESULTS ARE GOOD, OR A DISCOUNT IF RESULTS ARE POOR

- PEOPLE OFTEN ASK "HOW MUCH HAVE YOU SPENT ON THE PROPERTY?"

- FIRSTLY, EXPENDITURES ON A PROPERTY ARE OFTEN NOT INDICATIVE OF VALUE

- SECONDLY, ANY PREMIUM OR DISCOUNT IS ARBITRARY

- HOWEVER, THERE MAY BE SOME CORRELATION BETWEEN COSTS AND RESULTS

- AS WELL, ACCOUNTANTS LIKE TO SEE A WAY OF RECOUPING COSTS (EVEN IF THAT MIGHT BE IN MANY YEARS) TO AVOID A WRITEOFF.

3. BOOK VALUE FROM FINANCIAL STATEMENTS

- FOR EXPLORATION COMPANIES THAT CAPITALIZE EXPLORATION COSTS UNTIL A PRODUCTION OR ABANDONMENT DECISION, THIS METHOD IS OF LITTLE VALUE.

- YOU MAY NOT HAVE ABANDONED A PROPERTY, EVEN THOUGH IT MAY HAVE LITTLE OR NO VALUE (BASED ON SUBSTANTIAL EXPLORATION EXPENDITURES). THIS PROPERTY WOULD APPEAR ON YOUR BOOKS AS AN ASSET BASED ON COSTS INCURRED.

- CONVERSELY, YOU MAY HAVE SPENT VERY FEW DOLLARS, BUT HAVE A VERY VALUABLE PROPERTY

4. STATISTICAL OR PROBABILISTIC METHOD

- THIS METHOD IS BASED ON A STATISTICAL ANALYSIS OF THE AVERAGE VALUE OF AN ECONOMIC DEPOSIT (MINE) AND THE CHANCE OF DISCOVERIES BECOMING ECONOMIC AND OF ANOMALIES (DRILL TARGETS) BECOMING DISCOVERIES.

- THE METHOD IS RELATIVELY SUBJECTIVE FOR VALUING AN INDIVIDUAL PROPERTY, BUT MIGHT HAVE SOME VALIDITY IN THE CASE OF A LARGE PORTFOLIO OF PROPERTIES WITH SIMILAR TARGETS.

5. OPTION TERMS

- ONE CAN DETERMINE THE COMMITTED FUTURE EXPENDITURES AND CASH PAYMENTS BY AN OPTIONEE TO EARN AN INTEREST IN A PROPERTY.

- THESE EXPENDITURES AND PAYMENTS CAN THEN BE DISCOUNTED TO PRESENT DAY DOLLARS AND ADJUSTED FOR THE PERCENTAGE EQUITY BEING EARNED IN ORDER TO CALCULATE THE VALUE TO BE ASCRIBED TO THE OPTIONOR'S REMAINING INTEREST IN THE PROPERTY.

- THIS IS A MINIMUM VALUE, SINCE THERE ARE OFTEN OPTIONAL ADDITIONAL PAYMENTS AND/OR EXPENDITURES TO EARN AN INTEREST. THESE ADDITIONAL PAYMENTS OR EXPENDITURES MUST BE REDUCED BY NOT ONLY THE DISCOUNT RATE TO EQUATE TO PRESENT DAY DOLLARS, BUT ALSO BY A PROBABILITY OF CONTINUING WITH THE PROGRAM. THE ASSIGNMENT OF A NUMBER TO THIS PROBABILITY REQUIRES A SUBJECTIVE JUDGEMENT

6. MARKET CAPITALIZATION OF A COMPANY

- MARKET CAPITALIZATION EQUALS PRICE PER SHARE MULTIPLIED BY THE NUMBER OF ISSUED SHARES

- APPLICABLE IF LISTED ON A PUBLIC SHARE EXCHANGE

- APPLICABLE IF THE COMPANY'S MAJOR ASSET IS ALL OR A PORTION OF THE PROPERTY TO BE VALUED

- THE PRICE OF A FEW SHARES SOLD MAY NOT NECESSARILY BE REFLECTIVE OF WHAT ALL THE SHARES COULD BE SOLD FOR

- GIVES AN INDICATION OF VALUE, BUT IS DEPENDANT ON MARKET CONDITIONS, PROMOTIONAL ABILITIES, ETC.

7. COMPARABLE PROPERTIES

- ESTABLISH A VALUE BASED ON A KNOWN TRANSACTION PRICE OF A COMPARABLE PROPERTY?

- IN MINING, UNLIKE IN OIL AND GAS, THERE ARE FEW COMPARABLE PROPERTIES

- EACH OREBODY IS UNIQUE WITH REGARD TO GEOLOGY, COSTS, INFRASTRUCTURE, ETC.

- HOWEVER, SIMILAR PROPERTIES CAN GIVE AN INDICATION OF VALUE.

8. HISTORICAL COSTS PLUS BUDGETTED EXPENDITURES FOR THE NEXT PROGRAM

- THIS METHOD ASSUMES THAT THE ADDITION OF HISTORICAL COSTS PLUS THE PLANNED EXPLORATION EXPENDITURES FOR THE NEXT PHASE PROVIDES A VALUE

- ALTHOUGH THIS METHOD HAS OFTEN BEEN USED, BECAUSE NUMBERS ARE AVAILABLE, IN MY OPINION IT IS NOT LOGICAL SINCE IT ASSUMES THAT ALL PAST AND FUTURE EXPENDITURES WERE OR WILL BE RATIONAL AND THAT THERE HAVE BEEN NO MAJOR CHANGES IN DIRECTION IN THE PROGRAM

- ADDING THE COSTS OF THE NEXT PHASE BEFORE THEY ARE EXPENDED MAKES LITTLE SENSE

- HOWEVER, AN EXPLORATION PROGRAM THAT HAS BEEN FUNDED AND COMMITTED TO MAY GIVE A ROUGH INDICATION OF THE WORTH OF THE PROPERTY TO THE OWNER (NOT NECESSARILY TO THE COMPANY SPENDING THE MONEY)

9. GROSS CONTAINED METAL VALUE LESS A DISCOUNT FACTOR

- THIS METHOD IS OF NO VALUE

- VALUE DEPENDS ON THE RELATIONSHIP BETWEEN REVENUE AND COSTS

10. VALUE PER TON OF ORE IN THE GROUND

- THIS METHOD IS EXTREMELY ARBITRARY SINCE THE MATERIAL IN THE GROUND MAY HAVE LITTLE OR NO VALUE UNLESS THE RELATIONSHIP BETWEEN GRADE, RECOVERY, METAL PRICES, COSTS, ETC. IS SUFFICIENT TO GENERATE A PROFIT.

11. NET PRESENT VALUE (NPV) OR DISCOUNTED CASH FLOW (DCF)

- IF CASH FLOWS CAN BE ESTIMATED OR PROJECTED WITH SOME DEGREE OF CERTAINTY, THE DCF METHOD IS THE PREFERRED ONE.

- YEARLY CASH FLOWS ARE DISCOUNTED AT AN APPROPRIATE RATE (CONSIDERING THE RISK FACTORS) TO OBTAIN A NET PRESENT VALUE.

- DCF METHOD CONSIDERS THE TIME VALUE OF MONEY.

- DCF METHOD CONSIDERS THE ENTIRE ESTIMATED LIFE OF THE MINE OR ORE BODY.

12. DCF ADJUSTED TO REFLECT THE PROBABILITY OF SUCCESS

- FOR PROPERTIES AT A SUFFICIENTLY ADVANCED STAGE SUCH THAT GRADE AND TONNAGE CAN BE ESTIMATED OR PROJECTED, ONE CAN USE A COMBINATION OF THE DISCOUNTED CASH FLOW METHOD AND A PROBABILITY APPLICATION.

- THIS PROBABILITY IS BASED ON A JUDGEMENT OF THE LIKELIHOOD OF ACHIEVING A CERTAIN GRADE AND TONNAGE, AND, IN ADDITION, THE CHANCE AND TIMING OF PROCEEDING TO DEVELOPMENT.

13. PRICE/EARNINGS MULTIPLE

- ESTIMATE EARNINGS AND MULTIPLY BY A PRICE/EARNINGS (P/E) MULTIPLE

- ONLY USEFUL FOR AN ADVANCED PROPERTY OR PRODUCING MINE OR COMPANY

- AFFECTED BY BOOK ITEMS, SUCH AS AMORTIZATION AND DEPRECIATION, WHICH DO NOT AFFECT THE CASH FLOW

- METHOD IS ACCEPTABLE, BUT NOT AS GOOD AS THE DISCOUNTED CASH FLOW APPROACH (WHICH TAKES THE MINE LIFE INTO ACCOUNT).

14. PAYBACK PERIOD

- DETERMINES WHEN ALL YOUR INVESTMENT IS REPAID
- IGNORES THE IMPACT OF CASH FLOW IN LATER YEARS
- FOR EXAMPLE, YOU COULD INVEST 100 MILLION AND REQUIRE A 3 YEAR PAYBACK. HOWEVER YOUR RETURNS COULD BE 30 MILLION A YEAR FOR 3 YEARS (WHICH DOESN'T PAYBACK IN 3 YEARS) AND THEN 50 MILLION A YEAR FOR THE NEXT 5 YEARS. THE ARBITRARY APPLICATION OF THE PAYBACK METHOD WOULD ELIMINATE THIS GOOD INVESTMENT
- IN ADDITION, PAYBACK METHOD IGNORES THE TIME VALUE OF MONEY
- MAY BE USEFUL WHEN INVESTING IN POLITICALLY UNSTABLE AREAS

15. REPLACEMENT VALUE

- WHAT IT COSTS TO BUILD A MINE/MILL COMPLEX IS NOT RELEVANT TO THE VALUE OF A PARTICULAR DEPOSIT
- THE MINE/MILL COMPLEX ONLY HAS VALUE INSOFAR AS IT ENABLES ONE TO GENERATE PROFIT
- ONLY THE SALVAGE OR DISPOSAL VALUE IS RELEVANT IF YOU CANNOT GENERATE PROFIT

16. DOLLARS PER OUNCE OF ANNUAL GOLD PRODUCTION

- OFTEN USED BY INVESTMENT DEALERS/BROKERS
- THIS METHOD APPLIES A CERTAIN DOLLAR FIGURE TO EACH OUNCE OF ANNUAL GOLD PRODUCTION
- MUST BE USED WITH CAUTION, BECAUSE THE METHOD DOES NOT ACCOUNT FOR PROFITABILITY OF PRODUCTION OR MINE LIFE

17. DOLLARS PER OUNCE OF GOLD RESERVES

- OFTEN USED BY INVESTMENT DEALER/BROKER

- THIS METHOD APPLIES A DOLLAR AMOUNT TO EACH OUNCE OF GOLD RESERVE

- MUST BE USED WITH CAUTION, BECAUSE VALUE RELATES TO PROFITABLE PRODUCTION OVER THE LIFE OF THE MINE

18. OPTIONS PRICING MODEL

- THE OPTIONS PRICING MODEL TREATS A MINE OR PROPERTY AS AN OPTION, AND AS SUCH THE MINE OR PROPERTY HAS A VALUE GREATER THAN ZERO EVEN IF IT IS UNECONOMIC AT THE PRESENT TIME. SOME OPTIONS ARE AS FOLLOWS:

  FOR EXPLORATION PROPERTIES

  - OPTION TO EXPLORE, DROP, OR HOLD PROPERTY
  - OPTION TO PUT INTO PRODUCTION
  - OPTION TO SELL OR LEASE

  FOR PRODUCING PROPERTIES

  - OPTION TO INCREASE OR DECREASE PRODUCTION
  - OPTION TO SHUT DOWN OR RE-OPEN
  - OPTION TO HEDGE PRODUCTION
  - OPTION TO CHANGE COST STRUCTURE (CHANGE CUT-OFF GRADE)

- BECAUSE THE ABOVE OPTIONS HAVE VALUE, THE DISCOUNTED CASH FLOW VALUE IS OFTEN A MINIMUM VALUE. FOR MARGINAL PROPERTIES, THE OPTION VALUE IS A SIGNIFICANT PORTION OF THE TOTAL VALUE

NOW I WILL ADDRESS THE APPLICATION OF SOME SPECIFIC VALUATION METHODS, THE FIRST BEING "OPTION TERMS":

OPTION TERMS

AS STATED EARLIER, ONE CAN DETERMINE THE COMMITTED FUTURE EXPENDITURES AND CASH PAYMENTS BY AN OPTIONEE TO EARN AN INTEREST IN THE PROPERTY. THESE EXPENDITURES CAN THEN BE DISCOUNTED TO PRESENT DAY DOLLARS AND ADJUSTED FOR THE PERCENTAGE EQUITY BEING EARNED IN ORDER TO CALCULATE THE VALUE TO BE ASCRIBED TO THE OPTIONOR'S REMAINING INTEREST IN THE PROPERTY. THIS IS A MINIMUM VALUE, SINCE THERE ARE OFTEN OPTIONAL ADDITIONAL PAYMENTS AND/OR EXPENDITURES TO EARN AN INTEREST. THESE ADDITIONAL PAYMENTS OR EXPENDITURES MUST BE REDUCED BY NOT ONLY THE DISCOUNT RATE TO EQUATE TO PRESENT DAY DOLLARS, BUT ALSO BY A PROBABILITY OF CONTINUING THE PROGRAM

EXAMPLE:

OPTIONEE AGREES TO PAY $20,000 NOW, AND COMMITS TO $200,000 OF EXPENDITURES OVER THE NEXT YEAR, AND HAS THE OPTION OF PAYING $40,000 ONE YEAR FROM NOW AND MAKING EXPENDITURES OF $300,000 OVER THE SECOND YEAR TO EARN A 60% INTEREST

THE MINIMUM VALUE OF THE PROPERTY, BASED ON COMMITMENTS, WOULD BE CALCULATED AS FOLLOWS:

	PRESENT VALUE
ACTUAL CASH RECEIVED:	$ 20,000
ATTRIBUTED VALUES:	
A: BASED ON THE CASH PAYED FOR 60%, THE 40% INTEREST WOULD BE WORTH: $\frac{40\%}{60\%}$ x $20,000	13,300
B: BASED ON THE COMMITTED EXPENDITURES FOR 60%, THE 40% INTEREST WOULD BE WORTH: $\frac{40\%}{60\%}$ x 0.93* (TIMING) X $200,000	124,000
MINIMUM VALUE =	$157,300

THE ADDITIONAL VALUE, BASED ON AN ASSUMED 25% CHANCE OF MAKING THE $40,000 PAYMENT AND A 20% CHANCE OF COMPLETING A FURTHER $300,000 EXPLORATION PROGRAM, WOULD BE CALCULATED AS FOLLOWS:

EXPECTED CASH TO BE RECEIVED: $40,000 X 25% X 0.87 (TIMING)	$ 8,700
EXPECTED ATTRIBUTED VALUES:	
A: BASED ON THE EXPECTED CASH TO BE RECEIVED, THE 40% INTEREST WOULD BE WORTH: $\frac{40\%}{60\%}$ x $8,700	5,800
B: BASED ON THE EXPECTED EXPENDITURES, THE 40% INTEREST WOULD BE WORTH: $\frac{40\%}{60\%}$ X 20% X 0.81 (TIMING)	32,400
ADDITIONAL VALUE =	$ 46,900
TOTAL ESTIMATED VALUE =	$204,200

REASONABLE RANGE OF VALUE $150,000 TO $250,000

* ASSUMES A 15% DISCOUNT RATE AND EXPLORATION EXPENDITURES INCURRED EVENLY THROUGHOUT THE YEAR

MARKET CAPITALIZATION

THE MARKET CAPITALIZATION (SHARES ISSUED TIMES A PRICE PER SHARE) OF A COMPANY WITH AN INTEREST IN A PROPERTY CAN OFTEN BE UTILIZED TO GIVE AN INDICATION OF THE VALUE OF A PROPERTY. AN EXAMPLE FOLLOWS:

ASSUMPTIONS:

COMPANY HAS CASH OF	$225,000
OTHER ASSETS (NOT USED IN THE BUSINESS)	50,000
PAYABLES, DEBT, AND OTHER LIABILITIES	25,000
COMPANY LISTED ON THE TORONTO STOCK EXCHANGE	
SHARE PRICE OVER PAST 3 MONTHS RANGED FROM	30 TO 60 CENTS
SHARES ISSUED	3.0 MILLION
MARKET CAPITALIZATION (AT 45 CENTS/SHARE) IS:	
45 CENTS X 3.0 MILLION SHARES =	$1.35 MILLION
COMPANY OWNS 49% OF PROPERTY TO BE VALUED	

PROBLEM: TO VALUE THE 51% INTEREST

CALCULATIONS

VALUE ATTRIBUTED TO 49% INTEREST:

MARKET CAPITALIZATION	$1,350,000
MINUS: CASH ON HAND	(225,000)
OTHER ASSETS	(50,000)
ESTIMATED VALUE OF TSE LISTING	(200,000)
PLUS: PAYABLES, DEBT, AND OTHER LIABILITIES	25,000
VALUE OF 49%	$ 900,000
VALUE OF 51% = $\frac{51\%}{49\%}$ X $900,000 =	$ 937,000

PERHAPS ADD 10% FOR CONTROL AND MANAGEMENT FEE,
SO VALUE OF 51% INTEREST:

1.10 X $937,000 =	$1,031,000

VALUATION CONCLUSIONS

- VALUE OF 51% = $1.0 MILLION
- REASONABLE RANGE OF $0.5 TO $1.5 MILLION
- ALTHOUGH RANGE APPEARS WIDE, IT IS NOT UNUSUAL CONSIDERING THE RISKS OF EXPLORATION AND MINING AS WELL AS EXTERNAL FACTORS SUCH AS METAL PRICES, STOCK MARKETS, EXCHANGE RATES, ETC.

ADJUSTED DISCOUNTED CASH FLOW (DCF)

BECAUSE OF THE VARIABILITY IMPLIED IN AN INFERRED RESOURCE CLASSIFICATION, THE CALCULATION OF A NET PRESENT VALUE OF SUCH A DEPOSIT IS MISLEADING. A PREFERABLE APPROACH IS TO EXAMINE THE INFERRED RESOURCE AND THEN DEFINE A RESERVE OF CLEARLY VIABLE GRADE, DIMENSIONS AND METALLURGY THAT COULD REASONABLY BE EXPECTED TO OCCUR WITHIN OR ADJACENT TO THE INFERRED RESOURCES. A NET VALUE CAN THEN BE CALCULATED FOR THE POSTULATED RESERVE AND THIS CAN THEN BE DISCOUNTED BY AN ESTIMATE OF THE PROBABILITY OF ITS OCCURRENCE TO GIVE A PRESENT VALUE OF THE RESOURCE DEFINED SO EAR. THE MAJOR PROBLEM IS THE SUBJECTIVE ASSIGNMENT OF A PROBABILITY OF THE OCCURRENCE OF THE POSTULATED RESERVE.

FOLLOWING IS AN EXAMPLE OF THE APPLICATION OF THE METHOD:

ASSUMPTIONS:

- 5 TO 10 WIDELY SPACED DRILL HOLES
- PROSPECTIVE TARGET RESERVES SUFFICIENT FOR A 5 OR 6 YEAR LIFE
- REVENUES AND COSTS AS SHOWN ON THE FOLLOWING PAGE
- GOLD PRORERTY

EXAMPLE OF A GOLD PROPERTY
(MILLIONS OF DOLLARS)

	YEARS					
	0	1	2	3	4	5
REVENUE	0	55	55	50	50	50
OPERATING COSTS	0	25	25	25	25	25
OPERATING MARGIN	0	30	30	25	25	25
TAXES & ROYALTIES	0	5	5	5	5	5
OPERATING CASH FLOW	0	25	25	20	20	20
CAPITAL COSTS	75	0	0	0	0	0

NET PRESENT VALUES

DISCOUNT RATES	5 YEAR LIFE (INFERRED RESERVE)	6 YEAR LIFE
0%	$35 MILLION	$55 MILLION
5%	$20 MILLION	$34 MILLION
10%	$ 9 MILLION	$19 MILLION
15%	0 MILLION	$ 8 MILLION
20%	(6) MILLION	0 MILLION
25%	(11) MILLION	(7) MILLION

IF SOMEBODY USES A RATE OF 20% AFTER TAX AND THE INFERRED RESERVES ONLY, THE VALUE IS NEGATIVE $6 MILLION, SO THE PROJECT WOULD BE DROPPED (EVEN IF THERE IS A 100% CHANCE OF SUCCESS).

HOWEVER, IF ONE WERE TO USE A 5% DISCOUNT RATE, THE VALUE IS $20 MILLION. NOW IF ONE APPLIES A 50% CHANCE OF SUCCESS, THE VALUE IS $10 MILLION.

IF ONE EXPECTS ADDITIONAL RESERVES, THE VALUE INCREASES SUBSTANTIALLY BECAUSE THE CASH FLOWS FOR THE FIRST THREE OR FOUR YEARS ARE REQUIRED TO PAY OFF THE CAPITAL. FOR EXAMPLE, A 20% INCREASE IN RESERVES (FROM 5 TO 6 YEARS) INCREASES THE VALUE BY 70% AT A 5% DISCOUNT RATE (FROM $20 TO $34 MILLION).

CONCLUSIONS

1. THERE ARE MANY VALUATION METHODS, BUT MOST ARE NOT APPLICABLE TO EARLY-STAGE MINERAL EXPLORATION PROPERTIES

2. THE STAGE OF EXPLORATION OR DEVELOPMENT OF A PROPERTY INFLUENCES THE METHOD OF VALUATION AND THE "CERTAINTY" OF THE VALUATION

3. EARLY-STAGE PROPERTIES OFTEN HAVE TO BE VALUED, EVEN WITH THE LIMITED DATA AVAILABLE

4. USE MARKET INFORMATION WHEN AVAILABLE, AND OTHER METHODS AS "TESTS OF REASONABLENESS"

5. DO NOT USE TOO HIGH A DISCOUNT RATE FOR PROPERTIES PRIOR TO THE FEASIBILITY STAGE

6. ALL VALUATIONS OF MINERAL PROPERTIES ARE IMPRECISE, AND ARE MERELY ESTIMATES USING BEST JUDGEMENTS OF MANY INPUT FACTORS AT THE TIME

7. VALUATIONS CHANGE THROUGH TIME DUE TO CHANGING EXTERNAL ENVIRONMENT (GENERAL ECONOMY, METAL PRICES, AND TECHNOLOGY) AND TO ADDITIONAL INFORMATION ABOUT AN OREBODY

APPENDIX VI

ECONOMICS OF PORPHYRY COPPER-GOLD DEPOSITS

ECONOMICS OF PORPHYRY

COPPER-GOLD DEPOSITS

COPPER-GOLD PORPHYRY WORKSHOP
MINERAL DEPOSITS DIVISION
GEOLOGICAL ASSOCIATION OF CANADA

HOTEL GEORGIA, VANCOUVER
APRIL 5, 1989

BY: ROSS GLANVILLE
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689-2599
291-6731

PORPHYRY COPPER-GOLD DEPOSITS

I INTEND TO ADDRESS THE FOLLOWING TOPICS:

(1) OVERVIEW COMPARISON BETWEEN A COPPER-RICH AND A GOLD-RICH PORPHYRY

(2) NET MINE REVENUE PER TON AT VARIOUS METAL PRICES

(3) OPERATING COST AND CAPITAL COST COMPARISONS

(4) OPERATING MARGINS PER TON FOR TYPICAL B.C. PORPHYRY-COPPER DEPOSITS

(5) MARKETING COSTS/NET VERSUS GROSS COPPER PRICE

(6) COPPER PRICE OVERVIEW

(7) DISCOUNTED CASH FLOW EXAMPLE

(8) DISCOUNT RATE FOR GOLD PROPERTIES
DISCOUNT RATES FOR COPPER, COPPER-GOLD, AND GOLD-COPPER PORPHYRIES

(9) NET PRESENT VALUES AT VARIOUS METAL PRICES

(10) OTHER VALUATION METHODS

(11) SUMMARY

OVERVIEW COMPARISON BETWEEN A COPPER-RICH AND A GOLD-RICH PORHYRY

THE TWO EXAMPLES THAT I INTEND TO COMPARE IN A VARIETY OF WAYS ARE THE KERR DEPOSIT NORTH OF STEWART, B.C., AND THE MT MILLIGAN DEPOSIT WEST OF MACKENZIE, B.C. THE NEXT OVERHEAD SHOWS SOME COMPARATIVE DATA.

COMPARATIVE DATA

		KERR	MT. MILLIGAN
GRADE:	COPPER	0.85%	0.35%
	GOLD (OUNCES/TON)	0.010	0.025
ESTIMATED RECOVERY:			
	COPPER	90%	85%
	GOLD	60%	80%
MAIN MINERALIZATION		CHALCOCITE	CHALCOPYRITE
EXPECTED CONCENTRATE GRADE			
	COPPER	40%	26%
	GOLD (OUNCES/TON)	0.31	1.75
RESERVES:	CASE I	100 MILLION TONS	100 MILLION TONS
	CASE II	150 MILLION TONS	150 MILLION TONS
PRODUCTION RATE:			
	CASE I	17,000 TPD 6,200,000 TPY	17,000 TPD 6,200,000 TPY
	CASH II	25,000 TPD 9,000,000 TPY	25,000 TPD 9,000,000 TPY
MINE LIFE		16 YEARS	16 YEARS

NET MINE REVENUE PER TON

	KERR	MT. MILLIGAN
	(CANADIAN DOLLARS)	
US $1.40 Cu/US $400.00 Au	$23.55	$16.58
US $1.20 Cu/US $400.00 Au	$20.10	$15.30
US $1.00 Cu/US $400.00 Au	$16.82	$14.07
US $0.80 Cu/US $400.00 Au	$13.55	$12.85
US $450.00 Au/US $1.00 Cu	$17.15	$15.20
US $400.00 Au/US $1.00 Cu	$16.82	$14.07
US $350.00 Au/US $1.00 Cu	$16.50	$12.94

COPPER AND GOLD COMPONENTS OF NET VALUE PER TON

(US $1.00 COPPER/US $400.00 GOLD)

	KERR		MT. MILLIGAN	
	NET VALUE (CANADIAN $)	PERCENTAGE	NET VALUE (CANADIAN $)	PERCENTAGE
COPPER	$14.17	84%	$ 5.02	35%
GOLD	2.65	16%	9.05	65%
TOTAL	$16.82	100%	$14.07	100%

CAPITAL AND OPERATING COSTS

	KERR	MT. MILLIGAN
CAPITAL COSTS (MILLIONS OF CANADIAN DOLLARS)		
17,000 TPD (100 MILLION TONS)	$205	$150
25,000 TPD (150 MILLION TONS)	$260	$185
OPERATING COSTS (CANADIAN DOLLARS PER TON)		
17,000 TPD	$9.00	$7.00
25,000 TPD	$8.00	$6.00

TYPICAL B.C. OPEN PIT MINES

MINES	APPROXIMATE MILLING RATE	INITIAL RESERVES	NET VALUE*	OPERATING COSTS	OPERATING MARGIN
	TONS PER DAY	MILLIONS OF TONS	DOLLARS PER TON	DOLLARS PER TON	DOLLARS PER TON
GIBRALTER	40,000	350	$6.60	$4.20	$2.40
SIMILKAMEEN	25,000	60	$9.80	$4.80	$5.00
BRENDA	32,000	180	$6.00	$4.50	$1.50
VALLEY	130,000	870	$9.50	$4.00	$4.00
POTENTIAL MINES (ESTIMATES)					
KERR	25,000	150	$16.82	$8.00	$8.82
MT. MILLIGAN	25,000	150	$14.07	$6.00	$8.07

* WITH METAL PRICES AS FOLLOWS:

COPPER	US $1.00/POUND
GOLD	US $400.00/OUNCE
SILVER	US $6.00/POUND
MOLYBDENUM	US $3.00/POUND

COPPER CONCENTRATE MARKETING CHARGES

MINIMUM DEDUCTION: 1.0 UNITS

SMELTER TREATMENT CHARGE: US $60/TON

REFINERY CHARGE: US $0.10 PER POUND AT $1.00 COPPER

PLUS 10% OF ANY PRICE ABOVE US $1.00

MINUS 10% OF ANY PRICE BELOW US $1.00
(MINIMUM OF 8 CENTS/POUND)

GOLD PAYMENTS: - IF LESS THAN .02 TO .03 OUNCES/TON, NO PAYMENT

- IF ABOVE .02 TO .03 OUNCES/TON, AND LESS THAN 0.10 OUNCES/TON, PAY FOR 90%

- IF ABOVE 0.10 OUNCES/TON, BUT LESS THAN 0.16 OUNCES/TON, PAY FOR 93%

- IF ABOVE 0.16 OUNCES/TON, BUT LESS THAN 0.30 OUNCES/TON, PAY FOR 95%

- IF ABOVE 0.30 OUNCES/TON, PAY FOR 96%

SILVER PAYMENTS: PAY FOR 90% IF GRADE EXCEEDS 1.0 OUNCE PER TON, WITH A DEDUCTION OF US $0.25 PER OUNCE

TRANSPORTATION: TYPICALLY TRUCKING, LOADING ON SHIP, AND OCEAN FREIGHT TOTALLING CDN $45/TON OF CONCENTRATE

PAYABLE PERCENTAGE OF CONTAINED COPPER

	COPPER PRICE (U.S.$)			
CONCENTRATE GRADE	$0.80	$1.00	$1.20	$1.40
25%	65%	69%	72%	75%
30%	68%	72%	75%	77%
35%	71%	74%	77%	80%
40%	74%	77%	79%	82%

	ACTUAL NET PRICES RECEIVED			
	$0.80	$1.00	$1.20	$1.40
25%	52	69	86	105
30%	54	72	90	108
35%	57	74	92	112
40%	59	77	95	115

AVERAGE GROSS PRICE INCREASE	25%	20%	17%
AVERAGE NET PRICE INCREASE	32%	24%	21%

COPPER PRICE

IN TERMS OF 1988 U.S. DOLLARS

PERIOD	TOTAL YEARS	AVERAGE PRICE
1984 TO 1988	5	$0.84
1979 TO 1988	10	$1.01
1974 TO 1988	15	$1.15
1969 TO 1988	20	$1.25
1964 TO 1988	25	$1.26
1959 TO 1988	30	$1.26
1954 TO 1988	35	$1.28
1949 TO 1988	40	$1.26
1944 TO 1988	45	$1.22
1939 TO 1988	50	$1.19
1934 TO 1988	55	$1.15
1929 TO 1988	60	$1.13

COPPER PRICE

IN TERMS OF 1988 U.S. DOLLARS

PERIOD	TOTAL YEARS	AVERAGE PRICE
1984 TO 1988	5	$0.84
1979 TO 1983	5	$1.17
1974 TO 1978	5	$1.43
1969 TO 1973	5	$1.56
1964 TO 1968	5	$1.32
1959 TO 1963	5	$1.22
1954 TO 1958	5	$1.41
1949 TO 1953	5	$1.09
1944 TO 1948	5	$0.92
1939 TO 1943	5	$0.90
1934 TO 1938	5	$0.84
1929 TO 1933	5	$0.84

EXAMPLE

	0	1	2	3	4	5
REVENUE	0	100	100	80	80	80
OPERATING COSTS	0	50	50	50	50	50
CAPITAL COSTS	150	0	0	0	0	0
TAXES		0	0	0	10	10
NET CASH FLOW	(150)	50	50	30	20	20

CUMULATIVE NPV AT 0% = $20.0

5% FACTOR	.952	.907	.864	.823	.784	.746
DCF	(142.8)	45.4	43.2	24.7	15.7	14.9

CUMULATIVE NPV AT 5% = $1.1

10% FACTOR	.909	.826	.751	.683	.621	.564
DCF	(136.4)	41.3	37.6	20.5	12.4	11.3

CUMULATIVE NPV AT 10% = (13.3)

DISCOUNT RATE FOR GOLD PROPERTIES

1. P/E RATIOS OF 10 (TO 20) TO 1

   CONVERSE IS RETURN OF 10% (TO 5%) IN PERPETUITY

   OR 0% TO 5% REAL (WITH TODAY'S 5% INFLATION RATE)

2. GOLD LOANS OF 2% TO 3%

3. WEIGHTED AVERAGED COST OF CAPITAL (DEBT AND EQUITY) OF 5% REAL

4. ARTICLES BY MINING ANALYSTS, ACADEMICS, AND MINING EXECUTIVES

5. RATIOS FOR PRODUCING MINES AT 0%, 5%, 10%, 15% DCF RATES

6. RATES USED BY OTHER MAJOR GOLD MINING COMPANIES

7. FORWARD SALES AT A PRICE 3% TO 5% ABOVE THE PROJECTED INFLATION RATE

PRODUCING GOLD MINES (50 NORTH AMERICAN GOLD PRODUCERS)

VALUE BASED ON MARKET CAPITALIZATION	100%
VALUE BASED ON DCF (0% DISCOUNT RATE)	87%
VALUE BASED ON DCF (5% DISCOUNT RATE)	71%
VALUE BASED ON DCF (10% DISCOUNT RATE)	58%
VALUE BASED ON DCF (15% DISCOUNT RATE)	47%

		PERCENTAGE INCREASE
"CONVENTIONAL" 15% RATE	= x	0
VALUE @ 10% RATE	= 1.25 x	+ 25%
VALUE @ 5% RATE	= 1.52 x	+ 52%
VALUE @ 0% RATE	= 1.87 x	+ 87%
MARKET VALUE (SHARE PRICE)	= 2.14 x	+114%

100 MILLION TONS OF RESERVES

	KERR	MT. MILLIGAN
	(MILLIONS OF CANADIAN DOLLARS)	
US $1.40 Cu/US $400.00 Au	180	142
US $1.20 Cu/US $400.00 Au	115	115
US $1.00 Cu/US $400.00 Au	48	88
US $0.80 Cu/US $400.00 Au	(24)	64
US $1.00 Cu/US $450.00 Au	55	112
US $1.00 Cu/US $400.00 Au	48	88
US $1.00 Cu/US $350.00 Au	41	66

150 MILLION TONS OF RESERVES

	KERR	MT. MILLIGAN
	(MILLIONS OF CANADIAN DOLLARS)	
US $1.40 Cu/US $400.00 Au	345	365
US $1.20 Cu/US $400.00 Au	245	310
US $1.00 Cu/US $400.00 Au	135	255
US $0.80 Cu/US $400.00 Au	35	200
US $1.00 Cu/US $450.00 Au	145	305
US $1.00 Cu/US $400.00 Au	135	255
US $1.00 Cu/US $350.00 Au	125	205

SENSITIVITY TO DISCOUNT RATE

(US $400.00 GOLD/US $1.00 COPPER)

DISCOUNT RATE	MT. MILLIGAN
	(MILLIONS OF CANADIAN DOLLARS)
5%	$289
6%	$255
7%	$224
8%	$197
9%	$173
10%	$152

METHODS OF VALUING GOLD PROJECTS

1) PRICE/EARNINGS RATIO

OFTEN 10 TO 20 x EARNINGS

- BUT ADJUST FOR SHORT MINE LIFE AND DIFFERENCES IN OPERATING COST STRUCTURES

2) $ PER OUNCE/OF ANNUAL GOLD PRODUCTION

OFTEN $1000 TO $2000 US PER ANNUAL OUNCE

- ADJUST FOR HIGH COST OPERATION AS WELL AS OTHER FACTORS

3) $/OUNCE OF RESERVES

$100 U.S./OUNCE

- ADJUST FOR OPERATING COST STRUCTURE
- ADJUST FOR METALLURGICAL RECOVERY AND CUTOFF GRADE

NORTH AMERICAN GOLD PRODUCERS

	SENIORS	INTERMEDIATES	JUNIORS
NUMBER OF COMPANIES	15	19	15
ADJUSTED* MARKET CAPITALIZATION (MILLIONS OF US$)	$1,010	$97	$35
RESERVES (000'S OF OUNCES)	6,500	750	330
PRICE/EARNINGS RATIO ON 1989 EARNINGS ($425 US)	21	19	16
1992 GOLD PRODUCTION (000'S OF OUNCES)	500	90	55
U.S. $/ANNUAL OUNCE OF PRODUCTION	$2,150	$1,035	$600
P/E ON 1992 EARNINGS ($400 GOLD)	20	20	20
ADJUSTED MARKET VALUE (US$/OUNCE OF RESERVES)	$145	$105	$110
CASH OPERATING COSTS (US$/OUNCE)	$232	$283	$286

* ADDING DEBT AND SUBTRACTING WORKING CAPITAL.

GOLD

P/E MULTIPLES

LOEWEN, ONDAATJE, McCUTCHEON

(OCTOBER, 1988)	1988	1989	1992
(LARGER PRODUCERS)			
AUSTRALIA	17.4	13.1	10.8
NORTH AMERICA	25.7	20.7	17.3
SOUTH AFRICA	9.8	10.4	11.4

BURNS/FRY (JUNE 1, 1988) $\frac{\text{P/E GOLD}}{\text{P/E TSE}} = 2 \times$

GORDON SECURITIES (JULY, 1988)

(TSE LISTED GOLD PRODUCERS)	1988	1989
	20 x	18 x

PRUDENTIAL-BACHE

(MARCH, 1988) $\frac{\text{P/E GOLD}}{\text{P/E TSE}} = 2.5 \times$

BURNS, FRY

(JANUARY, 1989)	1989	1992
SENIOR PRODUCERS	21	20
INTERMEDIATE PRODUCERS	19	20
JUNIOR PRODUCERS	16	20

BUNTING		1988	1989	1990
(NOVEMBER, 1988)	P/E	21.0	17.5	15.9

GOLD

MARKET CAPITALIZATION PER EQUIVALENT OUNCE OF ANNUAL PRODUCTION

LOEWEN, ONDAATJE, McCUTCHEON (OCTOBER, 1988)

	U.S. $/OUNCE OF PRODUCTION		
	1988	1989	1992
AUSTRALIA	3,104	1,955	1,379
NORTH AMERICA	2,785	2,254	1,858
SOUTH AFRICA	628	613	563

PEMBERTON (AUGUST 10, 1988)

NORTH AMERICAN	2,810

GORDON SECURITIES (JULY, 1988)

	1988	1989	1990
	2,923	2,425	2,260

PRUDENTIAL-BACHE (OCTOBER, 1988) U.S. $1,830/ANNUAL OUNCE

BURNS, FRY (JANUARY, 1989)

	1992
SENIOR PRODUCERS	2,142
INTERMEDIATE PRODUCERS	1,033
JUNIOR PRODUCERS	590

GOLD

MARKET PRICE PER OUNCE OF RESERVES

GORDON SECURITIES: (JULY, 1988)	MEAN = $200 US/OUNCE	
PRUDENTIAL-BACHE (OCTOBER, 1988)	MEAN = $160 US/OUNCE	
BURNS, FRY (JANUARY, 1989)	SENIOR PRODUCERS	$148 US
	INTERMEDIATE PRODUCERS	$101 US
	JUNIOR PRODUCERS	$110 US

$1.00 COPPER/$400.00 GOLD	KERR	MT. MILLIGAN
	(MILLIONS OF CANADIAN $)	
EARNINGS (AT 100 MILLION TONS)	15	18
EARNINGS (AT 150 MILLION TONS)	34	33
CONTAINED GOLD OUNCES (AT 100 MILLION TONS)	1,000,000	2,500,000
CONTAINED GOLD OUNCES (AT 150 MILLION TONS)	1,500,000	3,750,000
PAYABLE GOLD (AT 100 MILLION TONS)	540,000	1,900,000
PAYABLE GOLD (AT 150 MILLION TONS)	810,000	2,850,000
CONTAINED COPPER TONS (100 MILLION TONS)	850,000	350,000
CONTAINED COPPER TONS (150 MILLION TONS)	1,275,000	575,000
GOLD PRODUCTION/YEAR:		
17,000 TPD (100 MILLION TONS)	33,000	118,000
25,000 TPD (150 MILLION TONS)	49,000	171,000

MT. MILLIGAN

(US $400 GOLD/US $1.00 COPPER)

	100 MILLION TONS	150 MILLION TONS
DISCOUNTED CASH FLOW	$88 MILLION	$255 MILLION
PRICE/EARNINGS AT 10x	$180 MILLION	$330 MILLION
$1500 CDN/OZ OF ANNUAL PRODUCTION	$177 MILLION	$257 MILLION
$100 CDN/OZ OF PAYABLE GOLD RESERVES	$190 MILLION	$285 MILLION

SUMMARY

(1) KERR AND MT. MILLIGAN PROPERTIES COMPARE FAVOURABLY TO OTHER B.C. PORPHYRIES

(2) HIGH GOLD COPPER-PORPHYRIES ARE RELATIVELY MORE ATTRACTIVE AND LESS RISKY

(3) THE DISCOUNT RATE MUST BE RELATED TO THE GOLD COMPONENT OF VALUE

(4) VALUATION METHODS OTHER THAN THE DISCOUNTED CASH FLOW METHOD CAN BE USED AS INDICATORS OF MARKET VALUE

APPENDIX VII

DISCOUNT RATE FOR GOLD PROPERTIES

DISCOUNT RATE FOR GOLD MINES

A 5% constant dollar discount rate has been utilized to reflect the fact that the product is gold, largely a monetary item rather than a consumable product like lead, zinc, and copper. The rational of such an apparent low discount rate follows:

1. The 5% rate is after inflation and income taxes. For comparative purposes, a treasury bill paying 12% would yield about 6% after income taxes, and only 1% after deducting the projected inflation rate of about 5%.

2. Price/earnings multiples for many of the gold companies producing less than 200,000 ounces per year range from 15 to 25. A price/earnings ratio of 20, for example, implies a return of 5% (or 0% in constant dollars if a 5% inflation rate is expected).

3. Gold loans typically carry interest rates of 2% to 4%.

4. The weighted average cost of capital for many gold companies is less than 5%.

5. Forward sales of gold can be made at price levels increasing at a rate of approximately 4% to 5% per year higher than the projected inflation rate. For example, if inflation projections are 4% over the next year, one could sell gold for delivery in a year at a price about 8% to 9% higher than today's price.

6. The market capitalization of major North American gold producers is greater than the net present value of the cash flows with no discount (0%).

7. Discount rates now used by several major gold mining companies for gold properties at the feasibility stage are 5% or less.

8. Articles by mining analysts, academics, and mining executives suggest that discount rates of between 0% and 5% are appropriate (see attached articles).

ARTICLES DISCUSSING DISCOUNT RATES FOR GOLD MINES

1. Loewen, Ondaatje, McCutcheon & Company Limited; Monitor Report, by John Hainey, August 28, 1990.

   Page 10: "Generally gold shares trade at a premium to net present value of future cash flows. At a 5% real discount rate, this premium is at least two times the NPV."

2. Burns Fry Limited; North American Gold Producer's Forward Gold Sales, Put Options, and Gold Loans Outstanding, by H. Fraser Phillips and Rosa Gaudio, June 1990.

   Page 1: "Another way to view the North American gold equity market is to examine the weighted average premium to NPV (0% discount) that the group is trading at. Over the past 18 months the stocks have traded at an average premium level of 23% (with a range of 5% to 35%)."

   Page 16: "The interest cost of a gold loan is relatively low, currently in a general range of 1% to 3% per annum."

3. Scotia McLead; Mining Investment Review, by Jonathan Challis, Graham Eacott, and Linda Kentner, September, 1990.

   Page 6: "The discount rate used in comparing a gold operation, for example, would tend to be much lower than that for a base metal operation, reflecting the much lower cost of funds available through the gold market, than a financing based on LIBOR."

4. Loewen, Ondaatje, McCutcheon & Company Limited; Monitor Report, by John Hainey, February 26, 1990.

   Page 6: "In estimating net asset value of the discovery, we believe a discount rate of 5% to be fair in this case." He is referring to the Louvicourt Property (a copper/zinc/silver property) of Aur Resources Inc. His use of 5% for a base metal deposit would suggest a much lower rate for a gold deposit.

5. Principles of Corporate Finance, by Richard Brealey, Stewart Myers, Gordon Sick, Robert Whaley, 1986.

   Pages 240 and 241:

   > The authors provide an example of a gold mine for which they do not discount the gold revenue stream. That is, they use a 0% discount rate.

6. A New Approach to Evaluating Natural Resource Investments, by Michael J. Brennan and Eduardo S. Schwartz, University of British Columbia, 1987.

   Page 79: "For any commodity which, like gold, is held for investment or speculative purposes, future output can be evaluated at the current spot price without any discounting."

7. Valuation of a Gold Mine, by Robert Mouat of Wright Engineers Limited; presented at the Canadian Institute of Mining and Metallurgy Conference in Vancouver, October 30, 1990.

   Page 12: "When establishing gold prices, the current gold price should be used. When applying a discount rate, a low discount rate should be used, perhaps even 0%."

8. Steve Semeniuk, Letter to Ontario Securities Commission, September 18, 1990

   Page 5: "The WACC (Weighted Average Cost of Capital, or discount rate) for several intermediate producers is calculated in the range of 1% to 3%."

9. Nesbitt Research; Canadian Golds, Winter 1989, by Julian Baldry, Egizio Bianchini and Dominik Dlouhy, Jr., Winter 1989 - 1990.

   Page 22: "Currently a gold loan bears an annual interest rate of 2% - 3% whereas an equity position will provide a small yield but also the potential for capital gains (i.e., growth). The 2% - 3% level represents a bank's charge for lending physical gold. It is under this rational that we use a discount factor of only 3%. In any case, we can see from the above that even with such a low discount factor, only four of the senior gold equities actually have a positive NPV given a gold price of $400 US/oz. A second justification is that 3% represents the "Real Rate of Return" longer term, i.e., when the inflation rate is subtracted from the interest rate. Inflation does not need to be included as it is a function of the gold price itself."

10. Scotia McLeod; Gold Shares - The Potential Upside as and When Gold Recovers, by Jonathan Challis, July 24, 1990.

   Page 3: "No escalation is applied to either the gold price or to our assumed cost structure over the life of the reserves. The cash flow was discounted at 0%. Thus, the theoretical value arrived at for each company assumes that all recoverable gold in the ground were mined today. (This is only justifiable if one assumes that gold will maintain its value in real terms over the life of the reserves - i.e. that one could purchase the same basket of assets with one ounce of gold in the future as one can buy today, and the costs will not sequeeze margins)."

11. Burns Fry Limited; North American Gold Companies Update, by Jean-Charles Potvin and H. Fraser Phillips, June, 1990.

   Page 44: "Gold shares in North America typically trade at a 20 - 22% premium to the intrinsic NPV Valuation (at a 0% discount) based on spot gold."

12. Loewen, Ondaatje, McCutcheon & Company Limited; Corona Corporation, Prime Resources, Stikine Resources, by John Hainey, June 15, 1990.

    Page 5: "Senior gold stocks generally trade at a minimum of two times their net asset value at the 5% discount rate."

13. Richardson Greenshields; Geddes Resource, by Raymond Goldie, February 6, 1990.

    Page 4: "Since the dollars used in our projections are "real" dollars - i.e., they do not include the effects of inflation - the appropriate discount rate is the real rate of return which has been experienced in Canada on stocks with small capitalizations. According to Colin Carlton (Canadian Investment Review, Spring 1989, pp 9-15), this rate is 6.1%. At a 6.1% discount rate, Geddes' share of the Windy Craggy project is worth $350 million."

    My comment is that the discount rate for a gold mine would be much lower than for this copper project (with a bit of gold).

14. Burns Fry; North American Gold Producers, by Jean-Charles Potvin, H. Fraser Phillips, and Rosa Gaudio, January, 1989.

    Page 7: "Of all the methods used, the ubiquitous Net Present Value approach is in our view one of the most representative yardsticks of value. Given that bullion is the alternative to holding gold shares, then the investor in theory will not expect an annual yield from his gold investment other than through capital gains. Thus, it becomes entirely appropriate to calculate a NPV using a zero discount factor.

Page 15: "The interest cost of a gold loan is relatively low, currently in a general range of 2% to 4% per annum."

15. Prudential-Bache Securities; Canadian Gold Review, by Barry Allan and Alan Ferry, August, 1988.

Page 10: "Ignoring inflation (assumes gold price and costs react equally to inflation), our experience is that the value of a gold asset is the sum of 1) the total undiscounted stream of net cash flow to be generated by producing assets and 2) the cash value of non-producing assets."

APPENDIX VIII

PRESENTATION BY W.E.L. TO THE C.I.M.M.

CANADIAN INSTITUTE OF MINING AND METALLURGY

VANCOUVER BRANCH

ELEVENTH

DISTRICT 6 MEETING

'MINING IN TRANSITION - LEADING THE WAY'

HOTEL VANCOUVER

VANCOUVER, B.C.

OCTOBER 29 - 31, 1987

VALUATION OF A GOLD MINE

INTRODUCTION

I have been asked to talk to you about the valuation of a gold mine. For purposes of this talk I will extend the definition of gold mine to include advanced properties, or those properties that have defined reserves. I will begin by describing a couple of the simplistic valuation methods. I will next discuss the value that the stock market places on a gold mine and relate this value to the standard method of valuing a gold mine, using discounted cashflow analysis.

SIMPLISTIC VALUATION METHODS

Although there are a variety of simplistic valuation methods, two of these have often been used to attempt to place a value on a gold mine. The first method is "costs spent to date" and the second method is "value per ton of ore". I will discuss each of these methods below.

A. COSTS SPENT TO DATE

This "costs spent to date" method means what it says. A tabulation of costs spent on the property is made. However, this method can yield misleading results. For example, the Vancouver Stock Exchange has raised over $600 million dollars in flowthrough shares so far this year. It is likely that a great deal of this money will be spent on properties that are abandoned. What is the value of a property if nothing of economic value is discovered or expected to be discovered? The answer, of course, is near zero. But most assume that if money has been spent on a property then that property has some value. This is often incorrect and accordingly one should be wary of placing a value of a property on this basis alone.

B. VALUE PER TON OF ORE

The second method of valuation that is used whenever one sees drilling results is "value per ton of ore" or put another way "ounces per ton of ore". We all know that grades below .03 ounces per ton are quite low (that is less than 1 part per million) and that grades over half an ounce per ton are rich. But in reality using these numbers can be almost as misleading as using the cost spent to date method. Using the value per ton of ore method fails to take into account the mining method, the stripping ratio if open pit, the distance from a workforce and power, the metallurgy (pressure leaching is a lot more expensive than heap leaching) the proven reserves, the capital cost and operating costs of a mine and mill and the royalties associated with the property.

MARKET VALUATION

The stock market gives us a few methods by which it attaches a value to a particular mine. These include:

Price/Earnings Multiple
$ per Annual Ounce
Market Capitalization

The price/earnings (P/E) multiple is probably the most common yard stick use in the market and it is simply the ratio of the price of the stock divided by the expected earnings. For the senior gold producers this ratio is around 40. This means that

if a company is listed that has earnings of $1 per share per year, the Stock Market (on average) would value a share of this company at $40. Looking at individual companies the P/E multiples (1) are:

Agnico Eagle	48
American Barrick	55
Breakwater	29
Belmoral	35
International Corona	51
Echo Bay	55
Hemlo	45
Lac	32

(1) Burns Fry, August 1987, Metals and Minerals, Bimonthly

The significance of this P/E multiple will be further discussed later.

The second method used by the stock market as a yardstick for determining the value of producing gold mines is the application of a "dollar per annual ounce of production" figure. This figure might be stated as $2000 U.S. per annual ounce of production, for example. Thus, if a mine produced 30,000 ounces per year, the use of the $2000 U.S. figure would result in a value of $60 million (30,000 x $2,000) U.S. or $80 million Canadian. Although this method is commonly used by brokers to determine an approximate value, one must be aware of a variety of factors which can influence their "dollar per annual ounce" multiples. For example, some of the very senior gold producers have multiples of $5,000 U.S. per annual ounce, while some junior

producers any have a multiple of only $1,000 U.S. per annual ounce. The higher multiple may reflect a variety of factors, including:

1) longer reserve life
2) several additional non-producing properties that are expected to be brought into production in the near future
3) excellent management with a track record of increasing gold production by development and acquisition
4) lower cost operations.

The third method used by the stock market is market capitalization. This method simply takes the share price and multiplies this by the number of shares outstanding to give market capitalization. This number is the market value of the mine, the price agreed on between a willing buyer and a willing seller (if all shares could be sold at this price). Valuations would be easy to perform if all gold mines traded on a stock exchange. To place a value on a mine one would simply multiply the share price times the number of shares outstanding.

However, many companies are not public, or if they are, they may have many other operations in a variety of commodities. Accordingly, alternative methods of valuation must be utilized. One of these alternative methods is the discounted cashflow approach and if performed correctly it should result in a value equal to the market value.

DISCOUNTED CASHFLOW METHOD OF VALUATION

The discounted cashflow (DCF) approach requires projecting yearly cash inflows or revenue and subtracting from them yearly

cash outflows. Yearly cash outflows include operating cost, capital cost, taxes, royalties and interest. Reduced to its simpliest form a typical cashflow calculation would be as follows:

Tons Milled
X Gold Grade
X Gold Recovery
X Gold Price
= Revenue
- Operating Cost
- Capital Cost
- Taxes
- Royalties
- Financing Charges

= Net Cashflow

After the net cashflow for each future year has been calculated it is discounted back into today's dollars. The reason for discounting is that a dollar earned in the future is not worth as much as a dollar earned today because of inflation, the risk of not being paid, and the return one could earn on alternative investments if one had that dollar today. Each year's cashflow is discounted, with the sum of the discounted values over the life of the project being the net present value or the market value of the mine.

There are some major advantages to using this method:

1) It accounts for every dollar spent and every dollar earned.

2) It incorporates the work of the mining and metallurgical engineers.

3) It accounts for risk, inflation and the cost of money.

4) It is general but consistent in its application.

5) It allows for easy analysis of the "what if" questions (sensitivity analysis).

There are some disadvantages to this method:

1) It requires prediction of the gold price.

2) It requires calculating a risk factor as one component of the discount rate. (See discussion of discount rates).

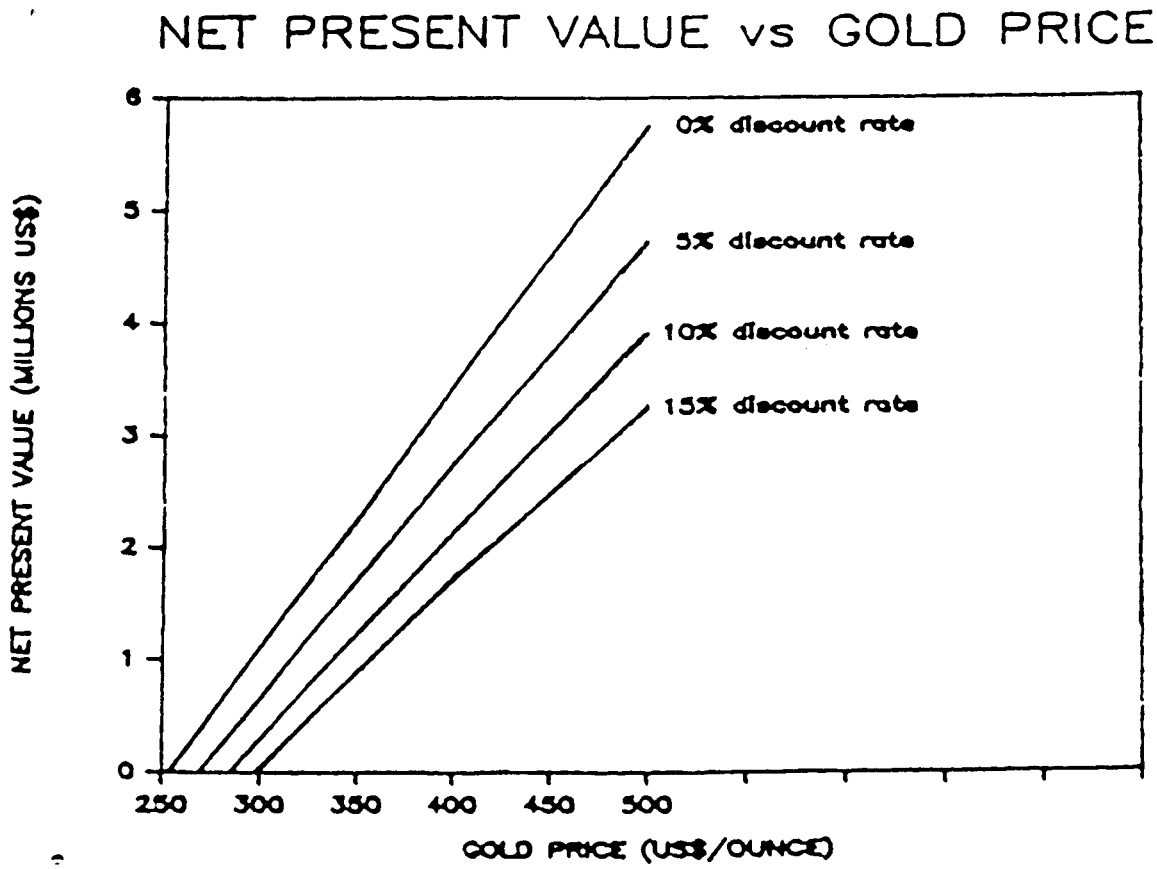
Before discussing these two disadvantages there is a third which often comes into play in a valuation, and that is estimating total reserves.

From the table on the next page it can be seen that although the estimated mine reserves in any particular year are often about 3 or 4 years, the actual mine lives in most cases have "turned out" to be many times that. For example, estimated mine lives for Dickenson, Dome, East Malartic, McIntyre, Pamour and Sigma have been stated at around 3 years, whereas actual production is shown at over 5 times that length, and will likely be even greater as mining continues in the future. In addition, the "factors" for several of the mines are well over 10 times, estimated mine life.

Estimated mine lives, as indicated above, are often very short (2 to 6 years, for example), because it is very costly to "prove up" reserves to such an extent that they classify as proven and probable. However, most mine operators expect the actual reserves to be much greater than the stated reserves. In fact, many industry experts and analysts value gold properties based on mine lives much longer than that which the stated reserves imply.

RESERVE ANALYSIS OF SELECTED CANADIAN GOLD MINES

	Period Analyzed	"Average" Stated Reserve Life (Years)	Ratio of Actual Reserves to Original Reserves Over Period Analyzed
Agnico-Eagle	1974-1981	4	1.4
Camflo	1966-1981	6	3.7
Campbell Red Lake	1952-1981	4-1/2	13.1
Dickenson Mines	1956-1977	3	5.4
Dome Mines	1951-1981	3	7.5
E. Malartic Mines	1948-1978	3-1/2	7.9
Giant Yellowknife	1954-1981	5	5.7
McIntyre Mines	1951-1971	3	3.4
Pamour Porcupine	1951-1981	2	13.2
Sigma Mines	1957-1981	2-1/2	7.0



The graph above shows the importance of both the gold price and the discount rate in the valuation of a gold mine.

DISCOUNT RATE DETERMINATION

In general a discount rate is made up of three components:

1) a real risk-free interest rate
2) an inflation rate
3) a risk (market) premium.

The real risk free interest and the inflation rate, if combined, can be approximated by the T-bill rate which is currently about 9%.

The market premium is the required return in addition to the risk free rate that the investment community demands. Historically this rate has been about 8% for a weighted average of all stocks on the stock exchange.

For individual companies the return demanded by the market depends on the risk of that company relative to the market as a whole. A device known as "Beta", is used for comparing this risk to the market's risk. Beta is a measure of the volatility of a security's rate of return relative to the volatility of the rate of return on the entire market.

For example, if it is found that the average rate of return on the stock goes up 15% when the rate of return on the market index goes up 10%, and goes down 15% when the rate of return on the market is goes down 10%, the stock would have a Beta of 1.5.

Studies of share prices show that the volatility of an individual company's share price in relation to the market as a whole does not change significantly over long periods. Business and financial risks of companies usually change slowly in relation to other companies. Hence, one can obtain a measure of anticipated equity risk for a particular company by calculating

.he beta from studying historical stock price movements.

While Beta is not a perfect measure of risk, it is frequently used as an objective measure of risk.

Hypothetically if the Beta of a mining stock is 1.2 then the market premium for that stock should be 1.2 x 8% = 9.6%

Summing up the components of the discount rate:

1)	Real risk free rate plus the inflation rate (T-bill rate)	9%
2)	Market Premium	9.6%
	Cost of Equity	18.6%

The after tax cost of debt is lower then the cost of equity.

10% interest x (1- tax rate (say 40%)) = 6%

By levering a project with say 50% debt the weighted average cost of capital is:

Cost of equity	18.6% x 50%	=	9.3%
Cost of debt	6.0% x 50%	=	3.0%
Weighted average cost of capital		=	12.3%

The market generated price earnings multiple of 40 suggests that the discount rate should be 2.5%. This compares to the 12.3% weighted average cost of capital calculated above. Why does the market believe that the discount rate should be so low?

In the last few years, finance researchers, recognizing the shortcomings of conventional DCF methods have applied the principles of option pricing theory to the study of cashflows. Some interesting new concepts have emerged which may help analysts value mining cashflows.

Concept #1 - Why Discount Gold Revenues

Unlike most mineral commodities, gold is purchased mainly as as a store of wealth. An investor purchasing gold is expecting to receive his return as an increase in the future price of his investment. He receives neither interest nor dividends on the investment and the storage costs are minimal. In this instance it can be said that the spot market gold price is equal to the present value of a future gold price. In other words, today's spot price for gold is equal to the future gold price discounted at the opportunity cost of capital. If the gold market is operating efficiently, the current spot market price for gold has already been discounted by the market for gold bullion. Thus, in theory, the financial analyst need not discount gold revenues at all if he is employing the current gold price in his projections. In this manner, the analyst is taking advantage of the gold market's combined consensus as to future gold price movements and discount rates. Is the individual who tries to predict gold prices a better forecaster than the gold market?

Concept #2 - Use of Option Theory

The main trouble with traditional DCF valuation methods centers around their "static" nature. They take no account of the fluctuating nature of metals prices or of the range of management's available responses to price fluctuation. If one could think of the owner of a mining operation as having the right to make decisions about the mine in response to changing

metal prices, then he has a series of "options" available to him. For instance, the owner has the option of shutting the mine temporarily during a period of low prices, or increasing production or changing the grades of ore mined. All these options have a definite value which the analyst may find difficult to evaluate with his conventional tools.

Under certain circumstances, the value of these "options" can be estimated by the use of certain mathematical techniques and some computer "number-crunching". In a sense, the situation is analogous to one who buys an option (a warrant) on a particular stock. The traded value of that warrant will always exceed the net proceeds from an early exercise of the warrant, even if the warrant will not be exercisable. And the value of the rights conferred by ownership of a resource will always be a positive number. A gold property which is clearly uneconomic merely because current gold prices are too low may still have considerable value. The value is that of the option to produce if prices increase.

The Practical Problem: Market Valuation vs. Securities Regulation

The Ontario Securities Commission (OSC) following its paper called "National Policy 2A" requires all valuations, for purposes of listing, to use only proven and probable ore reserves. The OSC further requires that valuations use current metal prices and that a discount rate of 10% real be applied. The stock market will disagree with the values that result using these criteria. Earlier discussion on reserves indicate that many mines prove up only 3 or 4 years worth of ore but have lives many times longer.

This would indicate the need to allow for "possible" reserves when calculating a value. However, possible reserves must be defined by "good engineering principles" and not just a statement that it is possible, etc.

The market does not reflect a 10% real discount rate. The price earnings multiple of 40 suggests that the discount rate should be 2.5%, including inflation.

CONCLUSION

A valuation of a gold mine relies on estimates for these critical parameters:

Ore Milled Per Year
Grade
Recovery
Operating Cost
Capital Cost

Subjective numbers are provided for these factors:

Total Reserves
Gold Price
Discount Rate

When establishing total reserves consideration should be given to at least some of the possible reserves. When establishing gold prices the current gold price should be used. When applying a discount rate a low discount rate should be used perhaps even 0%.