Watts, Griffis and McOuat
Consulting Geologists and Engineers

February 23, 2005

Mr. Robert D. Gibbens
Laxton & Company
10th Floor, 1285 West Pender Street
Vancouver, BC V6E 4B1

Dear Mr. Gibbens:

RE: VALUATION OF BLUE ICE CLAIMS OWNED BY MR. SEAN MORRISS KAMLOOPS MINING DIVISION, BRITISH COLUMBIA

Introduction

In accordance with your instructions, **Watts, Griffis and McOuat Limited** ("WGM") has reviewed the available information concerning the Blue Ice property and its effective expropriation as a result of the establishment of the Wells Gray Provincial Park surrounding the four claims 100% owned by Mr. Sean Morriss. Following our review, we have prepared a brief valuation opinion. We understand that you require this opinion in connection with your application for compensation to the Supreme Court of British Columbia.

We have considered the fair market value of the four Blue Ice claims as at March 21, 1989 (the "Valuation Date"). This date is deemed to be the date of "taking".

Fair Market Value is defined as:

> The highest price available in an open and unrestricted market between informed and prudent parties, acting at arm's length, and under no compulsion to act, expressed in terms of money or money's worth.

Ross D. Lawrence prepared the report, with assistance from John R. Sullivan and other WGM staff. Neither WGM nor Lawrence or Sullivan have any interest, directly or indirectly, in the Blue Ice claims and have no previous association with Mr. Morriss or the claims. Our fee for the report is based solely on time expended on the assignment.

Scope of Work Performed

We did not visit the property. Access to the property is difficult and expensive, and would provide little additional information to that reviewed for this report, especially in winter.

In order to expedite our review and valuation, we relied to a large extent on a report prepared by Mr. Ross Glanville in November 1989.[1]

We also reviewed certain other documents that were amongst those provided to us by you on September 22 and December 10, 2004. These include all of the documents referred to in the Glanville report. These are listed below:

Hedley, M.S., 1938: in Annual Report of the Minister of Mines of the Province of British Columbia for the year ended December 31, 1938, Part D.

Anglo-Huronian Limited, 1939: Diamond drillhole results and maps.

Langley, A.G., 1938: Summary Report of the Blue Ice Property, August 12, 1938.

Langley, A.G., 1940: Letter to W.C. Douglass, General Manager of Kelowna Exploration Co., describing the Blue Ice property, January 23, 1940.

Fearnly, R., 1953: Report on Blue Ice, Caribou and Future Price Mineral Claims, September 19, 1953.

Hachey, J. H., 1968: Report on the Blue Ice Group, March 15, 1968.

Quartermain, R.A., 1986: Report on the Blue Ice Property, May 1986.

Correspondence between the British Columbia government and Silver Standard Resources Inc. and predecessor companies from December 1963 to January 2001.

Property Description

The Blue Ice property consists of four mineral claims (Blue Ice, Future Price #1, Future Price #2 and Caribou). They are located in the northwest part of the Kamloops Mining Division, approximately 50 km west of Valemont, BC. Previous work done on the property includes geological mapping, trenching and sampling, and diamond drilling. No work has been done on the property since 1953 largely owing to various BC government restrictions.

Access to the property is difficult, as it is located in a mountainous area near the headwaters of Hobson Creek. Drainage from the area is south into Clearwater Lake, which drains into the

[1] Glanville, Ross, A Valuation of the Blue Ice Property for Consolidated Silver Standard Mines Limited, November 1989, Burnaby, BC.

Clearwater River and thence into the North Thompson River. To the north, drainage is into the Raush River, which flows to the Fraser River.

There are three routes into the Blue Ice claims. One is by way of the North Thompson River, from Gosnell on the Canadian National Railway, a distance of some 70 km. A second route is 25 km by trail up Hobson Creek from Hobson Lake. Hedley's 1938 report indicates that this is likely the best route. The third route follows the Raush River to its headwaters, a distance of some 80 km.

The property is best reached by helicopter from Valemont, 50 km east. The closest logging road terminates about 20 km southeast of the property.

Exploration and Development Work

Several exploration campaigns have been carried out on the property since 1923, when claims were first staked in the area. The claims were visited and exploration work done in 1926, 1927, 1928 and 1933 and notably in 1938 when ten diamond drillholes were drilled by Anglo-Huronian Limited for a total length of about 1,500 feet. Limited work was carried out in 1953. At that time, work was effectively terminated with the establishment of the Wells Gray Park. The four claims have been protected by an order-in-council since 1973, and permission to work the claims has been denied as recently as 1992.

Geology and Mineralization

Hedley described the geology of the area in some detail and the following outline is based on Hedley's description.

Three mineralized zones have been identified on the claims.

Zone 1: A quartz vein is found on the Caribou claim that is well exposed for over 600 feet. It varies in width from about six to eight feet at the upper end, narrowing to four to five feet for the balance of the vein, with local bulges to about 15 feet.

The greater part of the vein is barren, but selected samples from the upper end returned results as follows:

- Upper open cut – 0.62 oz Au/ton("t") and 2.4 oz Ag/t;
- Second open cut – 2.9 oz Au/t and 0.3 oz Ag/t in fine pyrite; and
- Almost solid sulphide – 0.6 oz Au/t, 7.0 oz Ag/t and 2.1% Cu.

Zone 2 (the Replacement Zone): A limestone band strikes across the Blue Ice, Future Price #1 and Future Price #2 claims. On the Future Price #1 claim, there is a heavily mineralized zone with pyrite forming a replacement zone. Surface channel sampling across 18 feet gave the following results:

- Five feet from the northeast wall, nearly solid pyrite: 0.74 oz Au/t, 0.3 oz Ag/t;
- Next five feet, 75% pyrite: 0.16 oz Au/t, trace of silver; and
- Next five feet, 75% pyrite: 0.24 oz Au/t, 0.6 oz Ag/t.

Other samples were taken southeast of this line:

- Ten feet southeast, almost solid fine pyrite near footwall, across two feet: 1.96 oz Au/t, trace silver;
- Thirty feet southeast, almost solid, coarse pyrite near centre, selected: 0.62 oz Au/t, 0.4 oz Ag/t; and
- Forty feet southeast, 5-foot channel to 1 foot from footwall, average section: 0.28 oz Au/t, 0.3 oz Ag/t.

Glanville provides an interpretation of the Replacement Zone, based on the surface information and the five holes drilled in this area. He extends the zone for 225 feet along strike, to a depth of 225 feet and over an average width of six feet. He calculates a tonnage of 18,225 tons; based on an assumption that 60% of that zone is ore. Glanville calculated an average grade of 0.89 oz Au/ton.

It should be noted that we have used the nomenclature of the day (in 1989) with respect to definitions of types of ore reserves, and these are based, for convenience, on definitions of ore that are provided in *Preparation of Mineral Reports* issued by the Association of Professional Engineers of Ontario and in *National Policy 2A* issued by the Canadian Securities Administrators. It should also be noted that National Policy 2A applies to securities matters and does not apply in any way to valuation matters.

Ten drillholes were drilled in 1938 on the zone on either side of a glacier lobe (which has apparently since retreated almost 500 feet) to test the limestone band containing the replacement zone. Over a strike length of 150 feet, four significant intersections were obtained:

- 0.53 oz Au/t over 10.0 feet;
- 1.77 oz Au/t over 12.3 feet;
- 0.18 oz Au/t over 5.0 feet; and
- 0.15 oz Au/t over 5.0 feet.

The weighted average grade for these intersections is 0.89 oz Au/t over 8.1 feet. The true thickness would be 6.0 feet.

Zone 3: East of the limestone band there is a large area of gold-bearing, sulphide-rich stockwork quartz veining. The full extent of this complex is not known. As shown on Hedley's Figure 3, the exposure extends for 460 feet in length with widths of up to 20 feet. Surface sampling in several areas has returned significant gold assays, such as 0.68 oz Au/t; 1.6 oz Au/t and 2.82 oz Au/t.

Another area of quartz veining lies some 2,000 feet to the southeast on the Future Price claims. Veining is more widely spaced and widths are variable over lengths of 200 to 300 feet. Samples of well-mineralized quartz include: 0.8 oz Au/t over 10 inches; 0.34 oz Au/t over 13 inches; 0.32 oz Au/t (grab sample?); 0.52 oz Au/t across a 24-inch vein and 0.66 oz Au/t (grab sample?).

Valuation Considerations

The Blue Ice property is a difficult type of mineral asset to value since there is no demonstrable current market. Exploration work has not been carried out for many years, only modest resources have been identified on the claims and there are only a few comparable properties for which values can be determined. This type of problem was recognized by the American Society of Appraisers many years ago and led to an Opinion of the ASA College of Fellows that was published in *Valuation*, vol. 22, no. 1 in June 1975. The opinion is titled *The Applicable Method for Valuation of Undeveloped Land for Which There is No Current Market.* The College concluded that the investment analysis method is applicable, which involves Discounted Cash Flow analysis to determine Net Present Value based on a forecast of the earnings expectancy of the property being valued. The complete opinion is appended.

The three traditional approaches to valuation are income, market and cost. Income approaches are usually applied to properties where the potential to produce income has been identified and quantified. Market approaches are based on the identification of comparable properties. Cost approaches are based on an analysis of the costs incurred to reach the stage of exploration exhibited for a property at the Valuation Date. All three approaches were considered in our review.

Discounted Cash Flow Analysis allows one to calculate the Net Present Value for an asset. One begins by establishing the ore reserves to be mined, the gold price to be used, and the metallurgical recovery to be achieved in the treatment plant in order to calculate the net revenue to be earned by operating the mine. The capital costs to bring a mine into production are estimated as are the operating costs to mine and mill the ore and to recover the gold. One can then prepare an estimate of the resulting cash flow year-by-year for the life of the reserves. The net cash flow for each year is then discounted back to the present, using appropriate discount rates, in order to arrive at Net Present Value.

Comparable Transaction Analysis is based on the Principle of Substitution, which says that the economic value of a thing tends to be determined by the cost of acquiring an equally desirable substitute. The principle applies equally to all types of property. It is important to emphasize the phrase *equally desirable*. An equally desirable substitute is not an asset that is *identical* to the one being valued. Comparable does not mean identical. An asset that may differ in several respects from the one being valued may be an equally desirable substitute. Further, it is necessary that the comparable transactions not only be similar, but that they are also relevant.

There are two strategies for identifying an equally desirable substitute. This distinction was discussed by Miles (2000)[2].

The **best-fit strategy** is based upon the concept that an equally desirable substitute can be found by selecting transactions for a few assets that bear a close resemblance to the asset being valued. Thus we attempted to identify transactions for properties in BC, where the level of exploration is similar and where direct analogies can be drawn. It is often commented that this method is difficult to use when valuing mineral properties since each property is unique with respect to factors such as geology, mineralization, costs, etc. In our view, those who make this comment overlook the fact that we are not trying to identify identical properties. We are trying to identify an equally desirable substitute. Nevertheless, we were only successful in identifying three properties that would be a substitute for the Blue Ice property.

The **total market strategy** uses a broad collection of data to develop a statistical model that will give a good measure of the overall market. There is no attempt made to use only similar properties. Rather one seeks to find a sufficiently large database that statistical inferences can be drawn. The subject asset is then analyzed to determine its relationship to the total market. This strategy lends itself to properties where mineral resources have been identified, and thus was used to provide a value for the Blue Ice claims.

Turning to cost approaches, the Appraised Value Method is based on the premise that the real value of an exploration property lies in its potential for the existence or discovery of an economic mineral deposit.[3] The method assumes that the amount of exploration expenditure justified on a property is related to its value. The basic tenet of the method is that an exploration property is worth the meaningful past exploration costs plus warranted future costs. An important element, which is often overlooked in its application, is that only those past costs that are reasonable and productive are retained as value. Productive means that the

[2] Miles, Raymond C. 2000: Using transaction data to value closely-held businesses – two strategies for using transaction data, ASA Business Valuation Review, v. 18, n. 3, September, 2000.

[3] Roscoe, William E. 2001: Outline of the cost approach to valuation of mineral exploration properties, in Mineral Asset Valuation Issues for the Next Millennium 2001 (VALMIN 01), AusIMM Publication Series 5/01, Melbourne, Australia.

results of the work give sufficient encouragement to warrant further work towards identifying the existence of an economic mineral deposit.

Discounted Cash Flow Analysis

As mentioned above, Glanville estimated a resource of 18,225 tons at a grade of 0.89 oz Au/ton (just over 16,000 ounces of gold). A mineable block of 21,870 tons at a grade of 0.74 oz Au/ton was then estimated. Glanville considered that an open pit from surface down to about 125 feet, to recover about 12,500 tons, might be a suitable way to exploit the known mineralization. A small mobile mill would be established at the site to treat the ore. At 90% recovery, 8,090 ounces of gold would be recovered with a value of $3,843,000 (using US$400 per ounce). After allowing for capital costs of $1,000,000 and operating costs of $1,373,000, net cash flow of $1,470,000 would remain.

We believe that a preparatory work program must be carried out, before proceeding with the production scenario. This would include establishing a camp on the property, establishing a grid, carrying out mapping, cleaning up and resampling trenches, further drilling and obtaining permits to carry out this program and more advanced work. A budget of $514,000 is suggested. This would reduce the net cash flow to about $1 million.

There are obviously a number of risks to be recognized in this scenario including the risk that the tonnage and grade estimated might be actually higher or lower, costs might be higher, weather might affect one's ability to carry out the postulated program and that operations might be adversely affected by the remoteness of the area.

Nevertheless, Glanville's analysis provides a useful approach to establishing a value for the property. He also points out that the value applies only to the Replacement Zone and that other zones on the property would add to the overall value. Glanville suggests a 50% premium for these other zones. WGM feels that 25% is a more appropriate figure. This would give a total value of $1,250,000 using this approach.

Comparable Transaction Analysis

To use **the best-fit strategy**, we attempted to identify transactions for gold exploration and development properties in BC, where the level of exploration is similar and where direct analogies could be drawn. Three comparable properties were identified. Summary details of the transactions were taken from the Canadian Mines Handbook or from the press releases announcing the deals. In each case, certain assumptions were made to allow the analysis to be made.

In 1988, **Placer Dome Inc.** obtained an option to acquire a 50% interest in the Elk gold prospect west of Peachland in the Okanogan area of south-central BC from **Fairfield Minerals Ltd.** Mesothermal, narrow quartz veins hosted by granitic rocks are found on the Elk

property in which very high gold values are found. Placer Dome could earn a 50% interest by incurring expenditures of $2 million and making payments to Fairfield of $500,000. While Placer Dome subsequently gave up its option, it should be noted that limited production has been achieved from the property and a successor company to Fairfield is now considering full-scale production.

This deal can be analyzed by assuming that the expenditures by Placer Dome would be made over four years and by simplifying the calculations to assume that all the expenditures by Placer Dome would be spent on the ground. Expenditures for each year are discounted to day one using a 10% discount rate. Probabilities are determined to allow for the fact that it is an option, with no guarantee that the optionor will carry on with the project.

TABLE 1
ANALYSIS OF PLACER DOME DEAL WITH FAIRFIELD MINERALS
ELK GOLD PROPERTY

Year	Expenditure ($)	NPV @ 10%	Probability	Net Value
1	$625,000	$568,000	1.0	$568,000
2	625,000	$516,000	0.8	413,000
3	625,000	$469,000	0.5	234,000
4	625,000	$427,000	0.2	85,000
TOTAL	**$2,500,000**			**$1,300,000**

The formula used to calculate the value of a property, where the expenditures are going into the ground, and not into the pocket of the property owner, is:

$$V_p = \$E * \frac{(100 - I\%)}{I\%}$$

Where: V_p is the value of the property
$E is the expenditure commitment
I% is the percent interest to be earned

$$\text{Thus: } V_p = \$1{,}300{,}000 * \frac{(100 - 50)}{50} = \$1{,}300{,}000$$

Therefore the property is worth $1,300,000.

A second comparable is the Dome Mountain Gold Prospect near Smithers in west-central BC owned by **Teeshin Resources Ltd**. In 1988, Teeshin indicated that it had plans to build a 350-tpd mill. **Total Energold Ltd.** optioned the property on the basis that it could earn a 50% interest by providing 80% of the capital expenditures needed to bring the project into production. The gold is found in a mesothermal quartz vein system with a reported resource of 300,000 tonnes at a grade of 12 g Au/tonne (320,000 tons @ 0.37 oz Au/t). The property is therefore more advanced that Blue Ice. Let us assume that a mill could be built with used

equipment at a cost of $20 million, which would have a discounted present value (in 1989) of say $8 million, if we assume that the funds would be spent over five years. This five years covers further field work, permitting and actual construction time. The Total Energold commitment (80%) would be equal to $6.4 million. Allowing for a probability of 25% provides a net value of $1.6 million. Using the same formula as above would give us a value of $1,600,000 for the property. There were legal problems encountered and Total Energold did not continue. Later Timmins Nickel Ltd. did achieve some production from the property.

A third comparable is a deal for the Doctor's Point prospect on Harrison Lake about 100 km east of Vancouver. Owned by **Rhyolite Resources Inc.**, epithermal gold mineralization is hosted by Mesozoic volcanics. In 1985 a resource was announced consisting of 120,000 tons of proven ore at a grade of 0.06 oz Au/t plus 150,000 tons of inferred. In 1987, **Universal Trident Industries Ltd.** signed an agreement whereby it could earn a 50% interest in the property in return for spending $2.5 million by December 1990. Drilling was done in 1988 and 1989 by Universal, but no further activity is reported.

As it happens, the figures for this deal are the same as for the Placer Dome deal outlined above, so Table 1 would apply equally to the Doctor's Point property, making it worth $1,300,000.

Several other comparable properties were identified, but insufficient acquisition details made any meaningful analysis impossible.

These three examples provide us with value indications of $1.3 to $1.6 million for roughly comparable properties to the Blue Ice claims. All are smallish, narrow vein gold properties. Arguably, each of the three is more advanced, and the values calculated may be said to be higher than Blue Ice is worth.

Turning then to **the total market strategy**, we use a broad collection of data to develop a statistical model that will give a good measure of the overall market. There is no attempt made to use only similar properties. Rather one seeks to use a sufficiently large database that statistical inferences can be drawn. The subject asset is then analyzed to determine its relationship to the total market.

In order to utilize this strategy, we referred to a study done by the Mining Business Digest[4] in 2000. While the data included in this study starts only in 1990, it provides some useful guidelines. The data was sub-divided into exploration, development and production segments. The exploration properties were necessarily somewhat advanced to the point where resources of some kind were outlined. We considered only the exploration data in our analysis.

[4] Mining Business Digest, A Decade of Deals: Gold & Copper Ore Reserve Acquisition Costs, 1990 - 1999, Castle Rock, Colorado, April 2000.

In the late 1980s and early 1990s, the price of gold was weakening. The median acquisition cost for gold exploration properties, expressed as value per ounce of gold in situ, fell from 5% of the gold price in 1990 to 4% in 1991 and to 2.5% in 1992. Projecting back to 1989, acquisition costs would be about 6% of the gold price in 1989 or about US$24 per ounce of gold in the ground. This equates to about $29 per ounce (Canadian dollars). During 1989, optimism in the gold exploration industry remained high following several years of robust exploration spending as a result of readily available flow-through funding. Thus we feel that the market for properties like Blue Ice can be valued in 1989 using a value per ounce in the ground equal to 6% of the gold price. At the Valuation Date, the gold price was just below US$400 per ounce, thus the value per ounce of gold in situ is US$24 per ounce, or about $30 per ounce.

Using Glanville's 18,225 tons at 0.89 oz Au/ton is 16,220 ounces. If we add a 25% premium for exploration potential elsewhere on the property, we get about 20,000 ounces. This would provide a value of $600,000 for the Blue Ice claims.

Appraised Value

There are no records available to show the amounts that have been spent on the property and the historic exploration data available for study is incomplete. We have, therefore, made an estimate of the cost to duplicate the work in 1989, as shown in Table 2.

TABLE 2
ESTIMATED COSTS FOR WORK TO DATE
(1989 Dollars)

Item	Unit Costs	Cost ($)
Access road/trail construction	Allowance	$50,000
Mobilization and demobilization, etc.	Allowance	50,000
Establish grid	Allowance	25,000
Prospecting and mapping	100 man-days @ $300	30,000
Trenching/sampling	350 m @ $200	70,000
Assaying	500 samples @ $40	20,000
Drilling	460 m @ $100/m	46,000
Camp operations	300 man-days @ $100	30,000
Geological supervision	Allowance	70,000
General overhead costs	Allowance	70,000
TOTAL		**$461,000**

All of this work advanced our knowledge of the geology and mineralization on the claims and added value to the property. The appraised value is therefore judged to be the sum of $461,000 (for costs to date) plus $529,000 (warranted costs for the next year's program as described in Table 3) for a total of $990,000.

TABLE 3
ESTIMATED COSTS FOR NEXT YEAR'S PROGRAM
(1989 Dollars)

Item	Unit Costs	Cost ($)
Mobilization and demobilization, etc.	Allowance	$50,000
Establish grid	Allowance	25,000
Prospecting and geological mapping	30 man-days @ $300	9,000
Clean-up and sampling of trenches	300 m @ $200	60,000
Assaying	500 samples @ $40	20,000
Drilling	2,000 m @ $100/m	200,000
Camp operations	200 man-days @ $100	20,000
Helicopter	60 hours $1,000/hour	60,000
Geological supervision	Allowance	20,000
General overhead costs	Allowance	65,000
TOTAL		**$529,000**

Valuation Conclusions

One of the key elements of the Fair Market Value definition is that there be an "open and unrestricted market". This key tenet is implicit in all of the valuation considerations that led to our opinion. Specifically, it is assumed that full access to the property was available to the owner, and that the owner would not face unusual impediments to development and exploitation of the property. We have also assumed that there would be no artificial restrictions imposed such as regulations that might apply to securities matters.

Three approaches have been taken to determine a value for the Blue Ice property.

Cash flow analysis (income approach) indicates a value of about $1,250,000. We have given this approach the greatest weight in reaching a conclusion concerning fair market value. While a considerable number of assumptions was made in this analysis, we nevertheless feel that the scenario outlined is the best way that the value of the property could be maximized (always assuming, of course, that a suitable administrative regime was established by the government).

Using a best-fit strategy for comparable transaction analysis (market approach) provided values in the range of $1.3 to $1.6 million. We feel that these values may be on the high side for Blue Ice. Using a total market strategy for comparable transaction analysis provides a value of about $600,000. We feel that this method gives insufficient weight to the value of the other mineralized zones on the Blue Ice property. We have therefore given this value the least weight.

The appraised value method (cost approach) gives a value of about $1 million to which we would give the second greatest weight. While certain assumptions were needed to make this estimate, it provides a good reasonableness test.

Having considered all of the factors outlined above, and having exercised our judgment, we have concluded that the Fair Market Value (assuming that the owner would be able to operate in an unrestricted market) for the Blue Ice claims as at the Valuation Date is in the range of $1.0 million to $1.3 million.

The presentation of our opinion as a range of values reflects the fact that it is rarely possible to be precise when making valuation conclusions. Recognizing that a single value may be useful to the Court, we suggest a value of $1.2 million.

Respectfully submitted,

WATTS, GRIFFIS AND McOUAT LIMITED

Per: Ross D. Lawrence, P.Eng.
Principal Consultant

RDL/ls
Attachments:
Curriculum vitae for Ross D. Lawrence
Opinion of the ASA College of Fellows

ROSS D. LAWRENCE, P.Eng.
Principal Consultant
Watts, Griffis and McOuat Limited

Ross D. Lawrence has established international credentials in the valuation of mineral properties and mining companies, mineral policy development for foreign and domestic governments, economic analysis of mining projects and project management. Mr. Lawrence has managed WGM's contracts with foreign governments pertaining to mineral development policy and institutional strengthening. Mr. Lawrence has served as Project Director on a wide range of mineral exploration and development projects in Europe, Australia, Africa, Asia and the Americas. Within Canada, Mr. Lawrence is President of the Canadian Association of Mining Equipment and Services for Export (CAMESE), and Chairman of the Northern Centre for Advanced Technology in Sudbury.

EDUCATION

M.Comm. (Mining Finance) - University of Toronto, Canada (1959).
B.A.Sc. (Applied Geology) - University of Toronto, Canada (1956).

PROFESSIONAL EXPERIENCE

Watts, Griffis and McOuat Limited (since 1962)

- Mr. Lawrence is responsible for WGM's extensive valuation practice, which has valued properties and companies ranging in value from under $100,000 to over $1 billion. Major assignments have included valuations for Esso Minerals Canada, Echo Bay Mines, Bering Straits Native Corporation, Asamera Minerals and international financial institutions. Recently, valuations have been completed for a number of tax-related financings for mining companies, and valuations in connection with corporate merger and acquisition activity.

- Mr. Lawrence has directed detailed financial analyses and projected cash flow models for feasibility studies and other financing documents for clients in Saudi Arabia, Alaska, northern Canada and Australia.

- Major projects managed by Mr. Lawrence include: exploration for ilmenite for QIT-Fer et Titane on beaches in Madagascar; a three-year evaluation of all exploration and geoscientific programs of the Directorate General of Mineral Resources of Saudi Arabia, resulting in the submission of 33 major reports; geological mapping and exploration for the Geological Survey of Iran; and a three-year institutional strengthening program for the Mineral Exploration Board of Yemen.

- Mr. Lawrence has provided strategic mineral development policy advice, amendments to National Mineral Codes and drafting of model agreements and contracts for governments such as Afghanistan, Yemen, Saudi Arabia and Ghana. Mr. Lawrence also participated in the Whitehorse Mining Initiative as a member of the Finance and Taxation committee.

- Industrial minerals projects managed by Mr. Lawrence include: asbestos projects in Alaska, Canada, Argentina, Greece and Ghana, fluorite in Alaska; cement projects in Saudi Arabia, Ecuador and Libya; and mineral market investigations across the globe.

Early Experience (prior to 1962)

- Prior to the founding of WGM in 1962, Mr. Lawrence was employed by Murray Mining Corporation and worked on the Asbestos Hill asbestos project in Ungava for three years. He carried out geological mapping for the Geological Survey of Canada in the Northwest Territories and explored for copper in Chibougamau and iron ore in Quebec, Labrador and northwestern Ontario.

PROFESSIONAL AFFILIATIONS AND DIRECTORSHIPS

Member (1957) and Designated Consulting Engineer (1974), Professional Engineers Ontario
Life Member, Canadian Institute of Mining and Metallurgy (1957)
Certified Minerals Appraiser, American Institute of Minerals Appraisers (1999)
Candidate Member, American Society of Appraisers
Subscriber, Canadian Institute of Chartered Business Valuators
Commissioner for Taking Affidavits, Province of Ontario (1962)
Director and President, Canadian Association of Mining Equipment and Services for Export
Director and Chairman, Northern Centre of Advanced Technology, Sudbury, Ontario

SELECTED PUBLICATIONS

Use of Inferred Resources in the Valuation of Mineral Assets - An Update. [With Mary-Claire Ward] Presented at the Mineral Appraisal Seminar Centre for Advanced Property Economics, Denver, Colorado, October 1, 2003

Valuation of Mineral Properties Without Mineral Resources: A Review of Market-Based Approaches. PDAC/CIM Mining Millennium 2000 Convention, Toronto, CIM Bulletin, April 2002.

Income Approaches to Valuation. Presented at VALMIN '01, Sydney, Australia, AusIMM, October 2001.

Should Discounted Cash Flow Projections for the Determination of Fair Market Value be Based Solely on Proven and Probable Reserves? Presented to Annual Meeting, Society of Mining, Metallurgy, and Exploration Inc., Salt Lake City, February 29, 2000, Mining Engineering, April 2001.

Mineral Exploration on Native Lands: The Alaskan Experience. A Model for Canada? Presented to the Canadian Aboriginal Mineral Association, Sudbury, Ontario, November 23, 2000.

Valuation of Mineral Assets: An overview. Presented as part of "The role of the Economic Geologist in Financing Exploration and Mining Projects", November 3, 1998.

Toronto - the World's Mining Finance Centre. 101st National Western Mining Conference, Colorado Mining Association, Colorado Springs, April 17, 1998.

Land Tenure in the Countries of Southeast Asia. Southeast Asian Mining Conference, Toronto, September 25, 1996.

Structuring Mining Ventures in a Newly-competitive Global Environment. Canadian Institute, Toronto, September 1994.

Ore Reserves. Association of Mining Financial Professionals, Denver, April 2, 1992.

Preliminary Feasibility Studies. Presented at Mintec '91, Sudbury, Ontario, August 19, 1991.

Valuation of Mineral Assets: Accountancy or Alchemy? CIM Annual General Meeting, Quebec City, May 2, 1989.

Raising Capital for New Mining Ventures. Mintec '87, North Bay, Ontario. September 9, 1987.

How to Improve Recruitment Procedures for Overseas Assignments. [with Dave Jackson] Worldwide Projects, October, 1984.

ASA College of Fellows

OPINIONS

Volume I
1975–1996

American Society of Appraisers

THE OPINION OF THE COLLEGE ON

The Applicable Method for Valuation of Undeveloped Land for Which There Is No Current Market

Initiation, Chair responsibility,
Henry A. Babcock, Ph.D., FASA

Published in Valuation, *vol. 22, no. 1 (June 1975)*

1. Introduction

The Opinion here presented deals with the valuation of wilderness land, mountain land, unused rural land, or, in more general terms, with that kind of land for which there is no demonstrable or determinable *current* market. The kind of land considered in this discussion is characterized by the fact that it is not put to any utilitarian use as of the valuation date. Two subclasses of this kind of unused land may be distinguished:

1. Land that has, in effect, no foreseeable future utilitarian use, that is to say, land the possible future use of which is so uncertain, remote, and speculative that no value can be ascribed to it.
2. Land that, while currently unused, does have a future utilitarian use that can be forecast with some degree of probability

It is the Opinion of the College of Fellows of the American Society of Appraisers (ASA) that land in the first category of unused, currently nonmarketable land has either *no* current value or an indeterminate current value, but that land in the second category can be valued by the method given hereinafter.

2. Appraisal Principles and Definitions

In the Opinion of the College, the following principles and definitions are applicable to the subject case:

2.1 Definition of Property

For the purpose of valuation, all of the legal rights to the future benefits derivable from something owned or possessed to the exclusion of other persons are defined as a *property*. The something owned may be tangible, intangible, or both.

2.2 The Principle of Generation of Property Value

The value of a property is generated by the expectancy of (future) benefits of ownership. The value, at a specified date, of the rights encompassed in an ownership is derived from the whole series of expected future net benefits. In any one year the net benefits may be positive, zero, or negative. Upon the termination of the ownership there may be a final benefit in the form of a net monetary return from the sale of the property. The series of expected net benefits, thus defined, begins with the valuation date and continues to the date the ownership terminates.

2.3 Classification of Property for Purpose of Valuation

Properties are classified for the purpose of valuation in accordance with the nature and character of the benefits derivable from the specified ownership under consideration. The classifications are:

2.31 Investment Property

Any property that is expected to produce owner benefits in the form of direct monetary returns.

2.311 Net Monetary Return

In the case of an investment property, the difference between the receipts and disbursements in any accounting period.

2.32 Marketable Noninvestment Property

Any property that does not possess the characteristic of generating monetary returns but that is of such a nature that the benefits of ownership are derived by use and/or consumption by the owner *and* that is of a type commonly bought and sold.

2.33 Service Property

Any property that does not possess the characteristic of generating direct monetary returns and that is *not* of a type commonly bought and sold but that is expected to produce benefits of ownership by use and/or consumption.

2.34 Hybrid Property

Any property for which the benefits of ownership are such that it cannot be exclusively classified as investment, marketable noninvestment, or service property.

2.4 Earning Expectancy

The series, beginning at a specified time, of the expected (future) net monetary returns from an investment property. In any year the net monetary return may be positive, zero, or negative.

2.5 *The Principle of Present Worth of an Earning Expectancy*

The present worth of the earning expectancy of an investment property is that specific capital amount of money which a purchaser is warranted in paying for the property, taking into account the investment risk involved.

The present worth of an expected *single* net monetary return is calculated by the equation,

$$w = r/(1+i)^n$$

where

- w = the present worth of the expected single net monetary return, in dollars;
- r = the dollar-amount of the expected single net monetary return;
- i = an annual yield rate, expressed as a decimal fraction (and more fully described below); and
- n = the number of years from the valuation date to the year in which the single net monetary return is expected to be received.

If the amount of the present worth, w, is invested and if it earns at the annual rate, i, compounded for n years, it will accumulate to the amount of the single net monetary returns, r. Therefore, the single net monetary return is *equivalent* to the amount of the present worth under the conditions stated. The accumulated amount, r, is comprised of the initial investad capital, w, and the accumulated yield. A purchaser of the right to receive the single net monetary return expects not only to receive a remunerative yield but to *conserve his capital* as well. This is the Principle of Present Worth of an Earning Expectancy.

The present worth of the entire series that comprises the earning expectancy of the property is the sum of the present worths of individual expected net monetary returns.

2.6 *Investment Analysis Method of Valuation*

The investment analysis method is the applicable method for the valuation of an investment property. It is not applicable in the case of marketable noninvestment or service properties.

The investment analysia method of valuation comprises four steps:

1. a forecast of the earning expectancy of the subject investment property;
2. an estimate of the accuracy of this forecast;
3. an appraisal of the yield rate applicable in the subject case; this appraisal of yield rate is based on the estimate of the accuracy of earning expectancy forecast that is the measure of the investment risk involved in purchasing the property; and
4. the calculation of the present worth of the earning expectancy.

2.61 The Role of Mathematics in the Investment Analysis Method of Valuation

The deductive mathematical treatment used in the investment analysis method of valuation does not produce the data or the estimates or the forecast—it merely derives the conclusions that must follow logically from the data and the forecast.

2.62 Investment Value

The application of the investment analysis method to the valuation of an investment property gives the investment value of that property. In circumstances where there is a current market for a subject investment property, the investment value and the market value are one and the same thing, the marketability factor having been introduced in the appraisal of the yield rate at which the present worth is calculated.

2.63 Owner-Investment Value

In the case of currently unused land that has a future utilitarian use that can be forecast with some degree of probability, it can also be forecast that when the land is put to use, it will have a then market value as a result of that use, that is, it could be sold or leased. The current owner, therefore, has the expectation of monetary return or returns when such conversion takes place. The present worth of this expectation is the current investment value of the property to the current owner or, in other words, the owner-investment value.

In the case of some unused land parcels, it may be possible to find a buyer who will pay a price equal to the owner-investment value, while in other cases it may not be possible to find such a buyer and an owner who is not forced to sell will not accept whatever price he can get in the *current* market, he will hold the property for future disposal or until he himself can put it to use. In such a situation, the property is described as "currently nonmarketable" and its value is *not* established by the "highest price the property will bring when exposed for sale in the *open* market."

3. Method for Valuation for Unused, Currently Non-Marketable Land for Which a Creditable Future Economic Use Can be Forecast

In the Opinion of the College, the applicable method for the valuation of unused, currently nonmarketable land for which a credible future utilitarian use can be forecast is the investment analysis method (Sec. 2.6).

3.1 Hypothetical forecast

Judicial rulings that deny to the appraiser the use of forecasts of future use of land and of the expected monetary results involved in such forecasts usually state that such forecasts are hypothetical, speculative, and remote and are not a proper basis for the determination of market value—that the proper basis for the appraisal of market value is the sale prices of comparable properties. The courts also reserve to themselves the right to decide which of the comparable properties used by the appraiser are admissible in evidence. From the foregoing outline of the investment analysis method and the explanation of the necessity for its use in the valuation of land in the herein described category, it is clear that the only proper land-conversion forecast is one which *actually can be expected to occur.* Such a forecast is not hypothetical or speculative in the sense that the forecasted events could happen or might happen. It is incumbent upon the appraiser to establish the de-

gree of probability that the forecasted conversion actually will occur. The higher the degree of such probability, the lower the yield rate used in making the valuation.

4. "Value in Use" versus "Value in Exchange"

The legal dictum that "comparable sales are the best evidence of value" apparently derives from the establishment of market prices of commodities, common stocks, and other fungible properties by continuous trading in an open market. If attention is confined solely to this class of property, one is tempted to conclude that marketability generates the value. But it is our opinion that the reverse is the case: the "value in use" generates the marketability.

It is our opinion that the value-in-exchange concept, namely market value, derived solely from prices paid for identical or equivalent properties without any consideration of the future benefits of ownership, is inapplicable in the case of undeveloped land for which there is no current market.

The assumption that marketability generates the value of a property has led to difficulties in the field of valuation. Not the least of these difficulties stem from the judicial ruling that "comparable sales are the best evidence" of value or, more precisely, "the prices at which comparable properties have sold are the best evidence of the value of a subject property."

When this dictum is applied to properties traded in units on an exchange and for which there is not only a current market but a more or less continuous market as well, the results are satisfactory. However, in the case of properties for which market quotations do not exist (real estate, business enterprises, patents, antiques original manuscripts, etc.) and for which the market is sporadic, deferred or nonexistent, the situation is different. Here the distinction between investment properties and marketable noninvestment properties is crucial, and yet, in practice, attempts are made by some to apply the principle without making a distinction between the two kinds of property.

In the case of the marketable noninvestment property, the rule is directly applicable only if sales of comparable property have taken place and, also, if it is reasonable to assume that a market exists for the subject property. Its strict application requires, first, a discovery, in each case, of what individual value elements are involved; second, the determination of the numerical magnitude of each such element; and third, a mathematical analysis of these magnitudes to relate them to the prices paid. This is the Sales Analysis Method. (In the case of some properties, however—for example, objects d'art—the value elements cannot be expressed numerically and the analysis used is a technique called Value Ranking.)

It is when attempts are made to apply the rule to investment properties that major difficulties appear. In the first place, the rule that "comparable sales are the best evidence of value" is by no means universally applicable, as pointed out above. Many investment properties are of a type not commonly bought and sold, and for some there is no market. A stone quarry, a refuse disposal pit, wasteland that some day may be converted to urban use, a manufacturing business making sewer pipe, and a railroad (considered as a single whole property) are investment properties that it would be quite impractical, if not actually impossible, to value on the basis

of comparable sales without giving consideration to the future benefits of ownership in each case. In the second place, even if sales of like properties were available in these cases, the problem of comparison remains. Comparison on the basis of physical characteristics—quantity of stone in the quarries, capacity of the refuse disposal pits, area of the wastelands, age and condition of the improvements of the sewer pipe companies, miles of track and number of cars of the railroad companies—would leave out many factors such as marketability of the products, management, location, costs of operation, etc. In our opinion, the only practicable basis of comparison in these cases is the single value element possessed by all investment properties, namely, *earning expectancy*. However, using earning expectancy as a basis for comparison involves forecasting of the series of net monetary returns and estimating the accuracy of this forecast, and this is nothing other than the investment analysis method of valuation, which could have been used at the outset. In the third place, the comparable-sale technique is based on the existence of value elements that are *common* to both the subject property and the comparable properties but fails to take into account the *unique* value elements of a subject investment property. In the investment analysis method, on the other hand, the effects of such unique value elements are included in the earning expectancy forecast.

Addendum

In the foregoing Opinion, the discussion is limited (Sec. 3) to currently *unused* land for which there is no fair *current* market value. However, the conclusions of the College are equally applicable to land that is currently in use but that can reasonably be expected to be converted to a *higher* use, that is, a use that will develop a higher land value at some future time.