

OVERVIEW OF VALUATION PAPERS PRESENTED TO SME (USA) AND CIM/PDAC (CANADA) CONVENTIONS IN 2000

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ABSTRACT

There were a number of valuation papers presented to the Annual Meetings of the Society for Mining, Metallurgy and Exploration Inc (SME) in Salt Lake City (USA) and the joint Prospectors and Developers Association of Canada (PDAC)/Canadian Institute of Mining, Metallurgy and Petroleum Engineering (CIM) in Toronto (Canada) in March-April 2000. A brief overview and listing of most of the papers presented and their Abstracts are covered in this paper.

INTRODUCTION

The Australasian Institute of Mining and Metallurgy's (AusIMM's) Mineral Valuation (VALMIN) Committee¹ has had the task of creating and updating a best practice code and guidelines dealing with the technical assessment and/or valuation of mineral assets and/or securities for inclusion in Independent Expert/Specialist Reports that are required under the Corporations Law (Reports), since its formation in 1991. The most recent version, "Code and Guidelines for Technical Assessment and Valuation and/or Valuation of Mineral and Petroleum Assets and Mineral and Petroleum Securities for Independent Expert Reports" (VALMIN Code, 1998) was approved by Council on 22 November 1997 and issued in February 1998 (together with an aide memoire to assist its interpretation).

As part of this process the work of valuation experts in the US and Canada is regularly monitored. The author visited to the Annual Meetings of the Society for Mining, Metallurgy and Exploration Inc (SME) in Salt Lake City (USA) and the joint Prospectors and Developers Association of Canada (PDAC)/Canadian Institute of Mining, Metallurgy and Petroleum (CIM) in Toronto (Canada) in March-April 2000.

The methods are generally broken down into those based upon market transactions (by far the preferred method in North America (especially in the US where the real estate mentality prevails, probably due to the historical predominance of private mineral rights); those base upon income; and those based upon costs.

OVERVIEW OF SME PAPERS

DCF/NPV MODELLING: VALUATION PRACTICE OR FINANCIAL ENGINEERING?

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ABSTRACT

Independent natural resource Valuers are an essential link between miners and mineral explorers on the one hand and the finance industry on the other. Investors (and regulators) expect the mining and financial industries to be vigilant against the use of inappropriate methodology or use of illogical steps within the chosen valuation method. The Australian Corporations Law generally requires an Independent Expert Report to support mergers and takeovers (as well as for capital raising activities). The introduction of the VALMIN Code (1998) by The Australasian Institute of Mining as Metallurgy, has meant that such Reports, when prepared in compliance with it, are now much more comprehensible and reliable than before. This is because the key requirements of the Code are for transparency and materiality in the Technical Assessment and Valuation Reports prepared in connection with the transaction involved. Transparency is particularly important because it allows the reader to identify and understand the assumptions made to derive a value and to then form a view as to the reasonableness of the result.

¹ Representatives come from AusIMM assessment and valuation practitioner members, Mineral Industry Consultants Association (MICA), Australian Institute of Geoscientists (AIG), Australian Securities and Investments Commission (ASIC), Australian Stock Exchange (ASX), Minerals Council of Australia (MCA), Petroleum Exploration Society of Australia (PESA), and Securities Institute of Australia (SIA).

Even though many elements of resource asset valuation practice are undeniably subjective, there must be some basis of objective rationality to it. Where the reasoning is patently illogical or the inputs are chosen to achieve a particular result, the estimated value must be viewed as virtually worthless. Experience, qualifications, competence and repute are the hallmarks of a professional technical auditor and valuer.

To illustrate how the system may be manipulated, this paper focuses on the derivation of the fair market value of a mineral property using the DCF/NPV Financial Modelling Method (and its variation, the Expected Value Simulation Modelling). DCF/NPV techniques, whilst generally better than simple use of comparative sales to determine value, are also prone to financial engineering. This paper is written from the perspective of a technically qualified valuation practitioner, but it concentrates on the financial rather than the technical assumptions in the modelling. For simplicity it focuses on the merger/acquisition domain, but its conclusions have general applicability.

Of concern to many is a growing trend for Reports, issued in connection with mergers/acquisitions, to appear to support a particular side if the transaction is a "hostile" one. Thus, a Report issued in support of the "prey" commonly uses rather more optimistic scenarios and input assumptions, whereas those supporting the "predator" less commonly tend to take a pessimistic position and thereby undervalue the "prey". Whilst this is fine in a corporate advisory sense, if Independent Expert Reports are to retain any credibility, they must be truly independent and transparent, otherwise it becomes merely an exercise in financial engineering.

This paper concludes that whilst it is preferable for valuations by DCF/NPV modelling techniques to give as much detail as possible in the derivation of the technical basis of the inputs used and the Discount Rate selected, it is more important for it to contain a table or graph showing the impact on the valuation of a change of 1% in the Discount Rate, from say zero to 15%pa (in real terms). This allows the reader to truly test the reasonableness of the valuation by estimating a value based on other Discount Rates. Also, there are other drivers of value in this methodology (notably assumptions about revenue, operating costs, initial and replacement capital, etc, but the most arbitrary of them is the Discount Rate used.

THE DIFFERENCE BETWEEN A VALUE ESTIMATE AND AN APPRAISAL **TR Ellis, Ellis International Services, Inc, Denver, Colorado, USA**

ABSTRACT

The vast majority of valuations produced for mineral properties using the net present value method provide an estimate of Investment Value or Use Value. Such an estimate can be a long way from the price that the property would sell at if placed on the market. Indicators from the market need to be used to validate or modify the net present value calculation. The comparable sales and replacement cost approaches used in the appraisal of urban buildings generally fail us in the appraisal of mineral properties. Other methods of sales analysis are introduced. Guidelines for what a minerals appraisal report should contain are presented.

LESSONS LEARNED ABOUT STANDARDS FROM APPLYING BOTH VALMIN AND USPAP ON A COMPLEX APPRAISAL PROJECT **TR Ellis, Ellis International Services, Inc, Denver, Colorado, USA**

ABSTRACT

The author attempted to concurrently apply the US Uniform Standards of Professional Appraisal Practice and the Australian VALMIN Code to a complex mineral property appraisal assignment. This led the author into many severe difficulties. These difficulties included the high standards needed in the work of others, and information and statements needed from the client. The exercise also highlighted many positive features of both documents. Some conflicts were found between the two documents. Implications and thoughts regarding the development of a set of US minerals appraisal standards are discussed.

EXTENSION OF THE GEOSCIENCE MATRIX METHOD OF PROPERTY VALUATION TO INDUSTRIAL MINERALS **HJ Sandri and DJ Abbott, Behre Dolbear and Co Inc, Denver, USA**

ABSTRACT

The Geoscience Matrix Method has proven useful for valuing metallic mineral properties lacking delineated mineral resources or reserves. However, the method explicitly excludes commodity markets from the factors considered, with marketability being assumed (something it cannot be assumed in the case of industrial minerals). Market considerations may also significantly affect the standard weightings of geoscience matrix

parameters such as the proximity to known deposits. In some cases, such proximity is desirable but in many cases it is undesirable. Application of the Geoscience Matrix Method to industrial mineral properties therefore requires thoughtful, market-related adjustments to the basic methodology.

In addition, we have made explicit that the various categories and sub-categories of factors described initially by Kilburn and which are used in this method, require that they be genetically and/or spatially related to the type of deposit believed to be on the property being evaluated. Finally, we have shown that for many industrial minerals, a valuation using the Geoscience Matrix method must include a weighting factor for marketing. For those minerals, industrial or otherwise, with high unit values and low place values, the market weighting factor can be 100%, thus meeting the implicit assumption originally made by Kilburn. Explicit recognition of this assumption, which is common in all types of mineral valuation should be made, even in those valuations for which the assumption holds.

SHOULD DISCOUNTED CASH FLOW PROJECTIONS FOR THE DETERMINATION OF FAIR MARKET VALUE BE BASED SOLELY ON PROVEN AND PROBABLE RESERVES?

RD. Lawrence, Watts Griffis and McOuat Limited, Toronto, Canada

ABSTRACT

Suggestions have been made that the appraisal of mining assets using discounted cash flow techniques should be based solely on proven and probable reserves in reliance upon the widespread international recognition of uniform resource definitions. Following a review of general accepted valuation principles, a survey of the literature and, most importantly, a review of real transactions in the open market, it is clear that valuers should not be constrained by the growing acceptance of modern mineral resource codes. On the contrary, valuation practitioners should be encouraged to examine all classes of mineralisation and, after making due allowance for risk, to utilise all mineral resources as a basis for determining fair market value.

USE OF A PROBABILISTIC APPROACH TO PRICE DETERMINATION IN VALUATION ANALYSIS

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ABSTRACT

The use of a probabilistic approach based on commodity prices for advanced stage deposits and operations can provide a reasonable method of valuing a mineral asset. It is a variation on the standard net present value of cash flow approach. The method is applicable for a project/operation with identified reserves/resources, a mine plan, no doubt in technical feasibility, but the property is un-economic at current prices. Utilizing the standard cash flow model, a desired return on investment is chosen, dependent upon the risks involved at the current state of development of the project. The price of the commodity required to achieve that desired return is then determined. This is essentially the reverse of standard cash flows, where prices are known and the cash flows, the net present values, and the internal rate of return are determined. Once a price is determined, the net present value for a specified discount rate is then reduced by the probability of the commodity achieving that price in the foreseeable future. This approach should be used in combination with other approaches described below and it should not be used for early stage or pre-feasibility properties since it relies on the same information as the Income Approach.

The Income Approach values operating mining assets as an ongoing business. This approach calculates the annual cash flow from the operations and discounts the net present value of the cash flow stream at an appropriate after-tax discount rate. This approach incorporates the concept that an operation will continue until ore reserves are depleted, and/or the cost of extraction and recovery are no longer economically viable. The Comparable Sales Approach values a mining asset/operation on the basis of the asset's recent sale within a designated period, or the sale of related/comparable assets within the designated period. The Cost Basis Approach is based on the replacement cost of the operation, less depreciable plant and equipment. Other items requiring valuation include inventories and supplies, financial assets, land, and the mineral deposit. Valuation of the mineral deposit tends to be on the basis of the unwritten-off exploration expenditures and undepleted mineral value, using the cost depletion calculation for the recoverable minerals in the proven and probable reserves

VALUATION OF COMPLEX METALLURGICAL PLANTS **Leons Kovisars, MET Research Corporation, Denver, USA**

ABSTRACT

Standard DCF/NPV modelling is the preferred method to use. The current value thus equals the net present value of the expected income stream from the plant. One needs to conduct a detailed examination of the revenues and expenses (especially contract treatment details, operating cost components, overheads, financial cost and taxes). There must be an explicit evaluation of uncertainty and risk using Monte Carlo analysis. Common errors include use of mixed basis for the model's inputs, with constant values for some (costs and prices) and inflated or current values for others (eg hurdle rates and interest rates); failure to consider opportunity costs; and evaluation of projects on a stand alone basis whereas it may be preferable to look at the impact on an enterprise.

WHITNEY BENEFITS: A CASE STUDY OF A MINERAL RIGHTS APPRAISAL IN ASSOCIATION WITH A REGULATORY TAKING **RL Bate, John T Boyd Company, Denver, USA**

ABSTRACT

Whitney Benefits, Inc owned a surface coal property in the Powder River Coal Basin in Wyoming, but leased the operation to Peter Kiewit Sons Co in 1974. The US government halted the development in 1977 by the passage of an Act (SMCRA) that prohibited surface coal mining within irrigated alluvial valley floors in the Western US. The owners litigated, with the trial being held in 1986 and final settlement being reached between the parties in 1995. The main point of this case was that it involved the unjust regulatory taking of economic value by imposing a regulatory burden on one or more property owners. The case also turned on whether the Income Approach (rather than the Market or Comparable Sales Approach) could be used in the "highest and best use" valuation and whether or not the operator's interest was a compensable property interest and which value was based upon the property value for coal or on its present 'business profits'. The Court found that the Income Approach could be used; that the operator's interest was compensable; and that the valuation could be based upon a larger operation (consistent with the Reserves) than currently existed. This was a case that generally broke new ground. It also determined that Discount Rates should not be risk-adjusted, but that the valuation should risk-adjusted.

PDAC/CIM PAPERS OVERVIEW

THE VALMIN CODE - THE AUSTRALIAN EXPERIENCE **MJ Lawrence, Minval Associates Pty Limited, Sydney, Australia**

ABSTRACT

The VALMIN Code was developed and formally adopted by The Australasian Institute of Mining and Metallurgy (AusIMM) in 1995 and a revision was issued in 1998. The VALMIN Code applies to all relevant reports under the Australian Corporations Law, including submissions to the Australian Stock Exchange (ASX) and the Australian Securities and Investments Commission (ASIC).

The VALMIN Code and Guidelines sets standards for the preparation and commissioning of independent assessment and/or valuation reports on mineral and petroleum assets or mineral and petroleum securities. It is mandatory for AusIMM's members to follow this Code in these relevant circumstances and failure to do so will result in serious sanction of the member by the AusIMM's Ethics Committee. Public support for the use of this Code has been given by regulators (ASX/ASIC) and market participants (eg, major accountancy firms). It is also endorsed as a guide to general best practice in project assessment and valuation. This paper discusses how the VALMIN Code has worked in practice over the past few years. It also examines areas where the Code could be improved and how it could form the basis of a new Canadian Code for mineral property valuation.

THE U.S. MINERAL PROPERTY VALUATION. PATCHWORK OF REGULATIONS AND STANDARDS.

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ABSTRACT

The valuation of mineral properties in the U.S. is only partially regulated. Much of the regulation which does exist, appears to be the result of unintended consequences. Court case history can also be important. The combined results are a mixture of bad and good, with important lessons to be learned.

Since 1981, the Securities and Exchange Commission has prohibited U.S. listed companies from reporting quantitative estimates of mineralization and the value of mineralization, other than proven and probable reserves. This results in the minerals appraiser (valuator) working with a shortage of data in his everyday work, both on the subject property and in sales analysis.

Approximately ten years ago, all 50 states and essentially all Federal agencies adopted the Uniform Standards of Professional Appraisal Practice (USPAP) for real property appraisals (valuations). The major appraisal societies also require their members to abide by USPAP. A significant portion of minerals appraisals must now follow these standards. The paper discusses the content of USPAP. It also provides a very good framework for the valuation of a minerals property or a mine, both as real property and as a business. However, the credentialing for appraisers is now prohibitive for minerals appraisers.

A CRITIQUE OF VALUATION METHODS FOR EXPLORATION PROPERTIES AND UNDEVELOPED MINERAL RESOURCES

IS Thompson, Derry, Michener, Booth & Wahl Consultants Ltd, Vancouver, Canada

ABSTRACT

Exploration properties form a continuum from grass roots to those with favourable geology, geochemical and/or geophysical anomalies, mineralization, showings (prospects), and finally to those with defined mineral deposits. Often properties exhibit a composite of these categories. The most problematic to value are properties or deposits that are not economically exploitable at the time of the valuation, due to a lack of exploration, insufficient grade or tonnage, poor mining conditions, or the imposition of socio-economic, environmental, or legal constraints. Various acceptable methods of valuing the range of all such mineral properties or deposits are reviewed. Some inappropriate methods are also discussed.

The Fair Market Value of exploration properties and undeveloped mineral resources can be determined by four general approaches: Geoscience Factor; Cost; Market; or Income. For properties without mineral resources, the Income approach is not appropriate. The Market Approach and Appraised Value methods, in my opinion, are the most defensible of the methods.

The British Columbia Securities Commission (BCSC) does not approve the application of a premium to past costs. They would prefer the valuator to use a different method to value what they called "spectacular" exploration properties. The BCSC accepts the Comparable Properties Method, but with many reservations, however they generally do not accept the Probabilistic Method or the Geoscience Factor Method since their subjective nature contravenes established policy. Sometimes they accept the Metal in Situ Method, but only as a check on other methods.

The Vancouver Stock Exchange (VSE) policy is that valuations based on Appraised Value, or Geoscience Factor or the Conceptual Ore Body (Probabilistic) Methods are generally not acceptable. Valuations based on a Premium or Discount on Costs, or Comparable Transactions, or Value of Metal in Situ, or on Option Terms, appeared to be the most useful in support of the issuance of a significant number of free trading shares, as a portion of the consideration for resource property acquisitions. A recent 1999 VSE opinion is that prior expenditures must be judged on their value to the purchaser and that in most cases the VSE does not consider proposed future expenditures to be a valid basis for establishing Fair Market Value. I agree with the first comment, but not the second. A proposed policy for the new Canadian Venture Exchange (CDNX) is currently in the discussion stage.

The valuation should be a range of values, if possible, rather than an absolute, and should be time and circumstance specific. This will leave the seller and the buyer room for negotiation, and, if a transaction results, a fair market value. The valuation is a subjective estimation and can be challenged. However, independent and responsible geologists should be able to value exploration properties within the same general range, say plus or minus 50%. The fundamental feature, however, in all valuation methods is the worthiness of future exploration; that is, the cost and extent of an achievable program is a measure of the esteem in which a property is held by others. Properties that are not explored do not increase in value unless

mineralization exists in the property and the price of the commodity, or the potential of the area, changes dramatically. Valuations are affected by the maturity of the country government and infrastructure is variable, with North America, Western Europe and Australia meriting higher unit values than those of developing countries

VALUATION OF MINERAL PROPERTIES WITHOUT MINERAL RESOURCES: A REVIEW OF MARKET-BASED APPROACHES

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ABSTRACT

Comparable transaction analysis is the best known of the market approaches to valuation of exploration-stage mineral properties. The analysis of option and farm-in agreements can also provide useful guidance to valuers. While such approaches can be distorted by incomplete analysis, market-based methods are capable of providing consistent, credible results when carried out carefully with due consideration paid to all factors which buyers and sellers consider when dealing in the real market.

Mineral properties without defined resources present one of the most challenging tasks to the mineral valuator. You will hear from others at this conference about the use of cost and income approaches to the problem of valuing exploration properties. This paper will concentrate on market-based approaches. These approaches are based on the principle of substitution and include such techniques as:

- Comparable transaction analysis (sometimes referred to as sales comparison analysis).
- Farm-in commitment analysis
- Rules of thumb

In Canada there are no valuation standards that apply to the valuation of mineral assets or securities. This problem is being addressed by the CIMVal Committee². Further, the recently established Canadian Association of Mineral Valuers will be giving consideration to the adoption of valuation standards. Australia has the best developed standard, known as the VALMIN Code, which has been adopted by the Australasian Institute of Mining and Metallurgy. This code was updated in 1998 and has now achieved widespread acceptance in Australia. While the Code may be given consideration in other jurisdictions, the VALMIN Code is directed toward Australian securities and corporate law matters. As a result, it has limited application in other jurisdictions without considerable revision.

In the US, the Uniform Standards of Professional Appraisal Practice (USPAP) was written in 1999 especially for the real estate sector. It is widely applied to the American mineral sector as a result of the peculiarities of US mineral title practice and the licensing of valuers by State Boards. The USPAP concepts are useful for American mineral valuations generally, but also need modification. The overall standard, in both the Australian and American codes, is that the selection of valuation methods to be used for any valuation is solely the responsibility of the valuator.

It is important to emphasize that the valuator must consider all appropriate valuation approaches in reaching the valuation conclusion. Indeed, if there is one strong conclusion to be drawn from a consideration of VALMIN and USPAP, it is that all three general methodologies must be considered. If one or two of them are excluded, the reason for exclusion has to be provided. The valuation conclusion must be considered within the context of other values obtained using other methods that may be found to cluster about a particular value range.

DISCOUNTED CASH FLOW ANALYSIS: INPUT PARAMETERS AND SENSITIVITY

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ABSTRACT

Discounted cash flow analysis provides a means of relating the magnitude of expected future cash profits to the magnitude of the initial cash investment required to purchase an asset or to develop it for commercial production. The objectives of discounted cash flow analysis are to determine:

The net present value of a stream of expected future cash revenues and expenditures.

The rate of return which the expected future cash flows will yield on a given level of initial cash investment.

² Canadian Institute of Mining, Metallurgy and Petroleum has established an ad hoc committee within the Mineral Economics Society with the objective of providing standards for the valuation of mineral properties in Canada. The goal of CIMVal is to complete its work by the end of 2000.

In the case of mineral properties, discounted cash flow analysis is generally accepted as the preferred method of valuation, whenever sufficient data are available to permit its reasoned application. Sufficient data are required to support estimation of all of the individual elements of cash revenue and cash expenditure which will be associated with the development and operation of the property, up to the end of its estimated life. It is the accuracy of these input estimates which determines the validity of the resulting determinations of profitability and rate of return on invested capital. In undertaking any discounted cash flow analysis, it is important to recognize certain fundamental attributes of the mining industry:

The basis of any mineral development is the existence of an ore reserve.

Costs are determined by the number of tonnes mined and processed, while revenues are determined by the number of pounds or ounces of metal produced. The two are related by the recovered grade of the ore. Profit is typically more sensitive to changes in revenue than it is to changes in cost.

Commodity price is a principal determinant of revenue, but it is also the factor with which is associated the greatest level of financial risk.

In the end, of all of the factors which must be considered in the discounted cash flow valuation of a mineral property, the most significant are the reliability of the reserve estimate, particularly with respect to recovered grade, the price at which the product is to be sold, and the risk of not maintaining the projected level of price.

VALUING MINERAL OPPORTUNITIES AS OPTIONS

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ABSTRACT

Traditional techniques for valuing resource projects companies have been primarily based on discounted cash flow methods (DCF) or by comparison to similar projects with an apparent market capitalization. Many resource projects are really forms of options to invest rather than a future cash flow stream. Employing the DCF method to value a resource project which is really an option to invest, can dramatically underestimate the real value of the project. The analytical tools required to evaluate options, while more complicated than the usual spreadsheets used for DCF, are becoming more easily available and usable by managers. This paper will discuss the background of options valuation and some of the tools which will make it easier for managers to estimate the value of projects and companies which have significant real option values.

Option theory provides a powerful framework for analysing a multitude of business problems, including valuation of investment opportunities, research and development expenditures, capital structure, divestment decisions, timing of investments and open/closure decisions. Mining valuation work covers a broad spectrum of projects from early stage exploration with little information and a wide range of possible outcomes, to valuations relating to project developments, acquisitions and divestment. Options theory has most direct applicability to the latter end of the valuation spectrum, when there is reasonably good information about resources, capital and operating costs. While options theory is a valuable addition to the valuator's toolbox, it is not applicable in every situation; it complements, rather than replaces, other valuation methods.

Options are the right, but not the obligation, to buy, sell or invest at a known price for a specified period of time. While more commonly known in the finance world, more complex options form part of business decisions in many industries. Understanding option theory will help valuers and managers make better judgments and business decisions.

"Real options" is a term that has become popular in recent years to describe the types of complex options occurring the "real world" of business. The knowledge and use of real options has exploded in the last few years and has gained wide acceptance amongst practitioners in a number of other industries. Mining has been seemingly slow to adopt new valuation technologies over the years. The reason for this is not entirely clear. One possible reason is the level and types of risks in mining. Not only are these risks high, but they are also more numerous and involve natural risks (i.e. mother nature) compared with other industries. This should not excuse industry practitioners from making themselves familiar with, and using, the best and most appropriate valuation techniques available. Real options analysis as applied to valuation work is most directly applicable to advanced minerals projects with a mineral resource and reasonably well understood capital and operating costs, and especially for projects which may be marginal or uneconomic at current metal prices.

VALUATION OF MINERAL EXPLORATION PROPERTIES USING THE COST APPROACH **WE Roscoe, Roscoe Postle Associates Inc, Toronto, Canada**

ABSTRACT

Mineral exploration properties are those on which an economically viable mineral deposit has not yet been discovered. Such properties are bought, sold, optioned and joint ventured on the basis of their perceived potential for the existence and discovery of a viable mineral deposit. The intrinsic value of an exploration property is therefore based on the exploration potential. One measure of the exploration potential is the amount that can be justified to spend on exploration for a viable deposit.

At present there are no comprehensive regulations or guidelines in Canada that specify what approaches and methods to use for the valuation of mineral properties. The purpose of this paper is to describe a cost approach to the valuation of mineral exploration properties and to provide some valuation examples. The particular cost approach described is the Appraised Value Method, which is best applied to mineral properties at the exploration stage. It is based on the premise that an exploration property is worth the meaningful past exploration expenditures plus warranted future costs to test remaining exploration potential. Results of past exploration work are analysed in order to retain only those past expenditures that are productive in terms of identifying remaining potential. Warranted future costs comprise a reasonable exploration budget to test that potential.

One of the important concepts in this definition that is critical to mineral properties is the effective date of valuation. This is because mineral property values vary over time, depending on events on neighbouring properties, market interest, commodity prices, etc. For an expropriation, insurance claim or litigation, the effective date may be a contentious issue in that the property owner may perceive that the property will be more valuable in the future when market conditions improve, and that the expropriation or legal issue forces the valuation in a time of poor market conditions.

THE VALUATION OF ADVANCED MINING PROJECTS & OPERATING MINES **C Roberts, National Bank Financial, Toronto, Canada**

ABSTRACT

While various methods are available to estimate a mining project's value, value is only established through a transaction. Comparable methods allow the value estimated for a mining project to be benchmarked against mining project values established in the market. Comparable methods thus are a key tool for ensuring value estimates are congruent with what the market would actually pay. For example, if the value estimated for a mining project using discounted cash flow analysis differs significantly from the value implied using comparable market methods, the valuator may be using metal price or discount rate assumptions that differ significantly from those the market is currently willing to pay for.

The paper provides an overview of market comparable valuation approaches, and discusses some of the difficulties and limitations that arise in using these approaches. The types of market values that are typically utilised are discussed, including asset sale prices, share prices (market capitalisations), and values established in corporate mergers and acquisitions. Topics discussed include methods used in estimating a mining project's value based on the market value of the company that holds the asset, and limitations that arise because of unique features of mining projects and of companies that hold them.

It is concluded that market comparable and fundamental (eg, NPV) approaches to project valuation should not be viewed as alternative approaches to estimating project value, but rather can and should be integrated to derive a single value estimate based on both market and fundamental data. A method for integrating these approaches is discussed, and illustrated by example.

CONCLUSIONS

It is through development of professional standards and guides to best practice in various areas affecting a professional's working life that AusIMM plays its part in ensuring the globalisation of the minerals industry is done in a rational way and in the interests of the individual professional, the company and the community. The promotion of the use of logical, transparent and defensible valuation practice is one specific way AusIMM can assist this process. The collection and minor editing of the above recently presented papers at SME/PDAC-CIM has been provided to assist the timely dissemination of international views on valuation practice.