



Towards a mineral property valuation code: Considerations for South Africa

by F.T. Cawood*

Synopsis

One of the consequences of globalizing mine finance is a necessity to apply uniform accountancy and valuation standards that are clearly understood and consistently applied by the global investment community. However, each country has unique circumstances, which sometimes make it difficult to align domestic practice with international requirements. South Africa is no exception and issues such as its political history, a taxation regime enforcing different rules on different mineral producers and a unique mineral rights ownership distribution, are barriers to internationalization. The economy is in a transitional phase as a result of the many and diverse policy documents following the change in political dispensation in 1994. Many of these documents have recently been implemented through new legislation and, in the case of mining, negotiations are continuing in order to ensure an acceptable outcome. This paper discusses the challenges that the South African minerals industry faces in the field of mineral property valuation. It draws on international experience and includes a discussion on the unique considerations that the South African mineral property market must take into account in establishing a code for this purpose, as such a code could later be aligned with international practice.

Introduction

The scale at which the South African minerals industry internationalized after the 1994 democratic elections, emphasized the need to standardize and align domestic mineral property valuation practices with those of international standards. This international influence is clearly visible in the SAMREC Code, the Johannesburg Securities Exchange (JSE) listing requirements, and accounting standards for reporting mine values. Whereas the typical mining company of the 1980s had a large corporate head office with technical departments looking after standards in the group, it has become increasingly difficult to afford these expensive structures while maintaining international competitiveness in a market of declining real commodity prices. Best practice is now the responsibility of every mine and this has emphasized the need for:

- ▶ A common (global) understanding of certain keywords and

- ▶ Internationalization of valuation standards, approaches and methods.

Apart from the above-mentioned corporate changes, the State had, during the years of political isolation, developed laws and policies, which differed from those encountered elsewhere. However, since 1994 the State has moved towards a situation where its policies are more in line with those of international practice. These policies are restricted to those having a direct influence on mine value, such as the Mineral Policy (change in mineral right ownership, which is the fundamental asset of any mineral property) and Tax Policy (reduction of corporate taxes to the global average, introduction of residence-based taxation and, more significantly, capital gains tax on the disposal of mineral properties).

This paper discusses typical South African mineral property valuation issues and briefly mentions the approaches and methods for determining and reporting mine value. It also includes a discussion on international mineral property valuation practice and how South African practice relates to it. The international influence is limited to Australia and Canada because the issues surrounding valuation are similar to those in South Africa.

Technical mine evaluation

Technical evaluation refers to evaluation practices that establish the mineral content of the reserve as well as all other technical activities required to investigate the variables influencing the content calculation. It includes surveying measurements, sampling, testing, geological investigations, mass calculation, grade estimation and reserve accounting methods. In brief, technical evaluations are about predicting, assessing, reconciling and

* School of Mining Engineering, University of the Witwatersrand.

© The South African Institute of Mining and Metallurgy, 2004. SA ISSN 0038-223X/3.00 + 0.00. Paper received Sep. 2002; revised paper received Oct. 2003.

Towards a mineral property valuation code: Considerations for South Africa

accounting recovered contents for delivery to the markets. Technical evaluations may be further classified as resource evaluation and reserve evaluation, depending on the purpose for which the evaluation results will be reported.

Technical evaluation methods range from conventional evaluation approaches to advanced estimation methods. The conventional approach deals with mass calculations, averaging of samples under various conditions, as well as the evaluation of technical control factors necessary for reserve accounting and reconciliation. These form the basis for the more advanced evaluation techniques. Statistical methods deal with the analysis and application of statistical distributions in estimating grade. Advanced methods analyse spatial structures of statistical variables, commonly referred to as geostatistics, in order to estimate variables at specific locations for different supports.

International practice

Although the evaluation method is left to the discretion of the valuer, international standards were developed to allow for a common understanding of what constituted mineral reserves and resources. A code for international best practice reporting was necessary in order to limit fraudulent mine evaluation and valuation practices, which need was made obvious by the 1997 Bre-X scandal. The realization that the Busang gold property's gold content was insignificant, as opposed to the 'tens of millions ounces of gold' claimed earlier, damaged investor confidence in junior exploration companies (*Mining Journal*, 1998). Within a very short time frame, the value of the Bre-X property, as measured by its listing price on the Toronto Stock Exchange (TSE), fell from six billion Canadian dollars to virtually nothing. The TSE launched an immediate investigation into reserve evaluation and mineral property valuation reporting practices, which process culminated in:

- ▶ A reserve evaluation code of practice called the CIM Code, which was incorporated by the TSE as National Instrument 43-101 that was released in 2001, and
- ▶ A financial valuation code of practice (CIMVAL).

In retrospect, had the Canadians followed the example of the Australians sooner, whose JORC code was released in 1996, the Bre-X scandal could have been avoided. The leading region in defining best evaluation practice is without a doubt Australia with its JORC (1996) Code. This Code was updated in 1999 and has become the standard against which international best practice can be measured. The Australian example was followed by South Africa's SAMREC (2000) and Canada's National Instrument 43-101 (2001).

South African developments

South Africa has a long history of mining and has produced world-renowned technical evaluation specialists*. Although

Storrar (1981) was (and still is) widely consulted as the 'South African Valuation Standard', it is a textbook discussing technical issues and it was never intended to be a reporting standard for the South African mining industry.

The main reason for the absence of a reporting code defining best evaluation practice was because senior and respected individuals in the corporate head offices of the major mining houses guarded standards in their respective group of mines. These experts applied the technical principles of Storrar to their group of mines, thereby ensuring uniform values and consistent reporting throughout the group. Head office restructuring, international expansion, downscaling of the gold sector and the emergence of a junior mining industry financed by foreign investors, prompted the need to establish the South African Mineral Resource Committee (SAMREC), with the aim to codify best practice. The South African Institute of Mining and Metallurgy (SAIMM) gave direction to the process by taking responsibility of custodianship after a request from the Council of Mining and Metallurgical Institutions (CMMI).

The South African version of the JORC Code, known as the SAMREC Code, was compiled under the auspices of the South African Institute of Mining and Metallurgy (SAIMM) and was approved as the standard for public reporting of reserve and resource statements as from March 2000. The Code defines mineral reserves and resources in detail and provides detailed checklists for the considerations at issue during the collection of information. The main focus of SAMREC is to provide a code for public reporting of mineral resources and mineral reserves, so that these are reported

- ▶ **A mineral resource is defined as** 'a concentration (or occurrence) of material of economic interest in or on the earth's crust in such form, quality or quantity that there are reasonable and realistic prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a mineral resource are known, estimated from specific geological evidence and knowledge, or interpreted from a well-constrained and portrayed geological model. Mineral resources are subdivided, in order of increasing confidence in respect of geoscientific evidence, into inferred, indicated and measured categories.'
 - ▶ **A mineral reserve is defined as** 'the economically mineable material derived from a measured and/or indicated mineral resource. It is inclusive of diluting materials and allows for losses that may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and government factors. These assessments demonstrate at the time of reporting that extraction is reasonably justified. Mineral reserves are subdivided, in order of increasing confidence in respect of geoscientific evidence, into probable mineral reserves and proved mineral reserves.'
- SAMREC 2000**

Evaluate means

- ▶ To find the amount of...'
- ▶ 'To judge...'
- ▶ To determine the quality of...'

Collins Dictionary

*A good example is Professor Krige, after whom the term 'Kriging' was named in recognition of his contribution to mine evaluation

Towards a mineral property valuation code: Considerations for South Africa

according to the same terminology and confidence category. In a roundabout way, it has become a guideline for technical mine evaluation in the classification of reserves and resources. The method of technical evaluation is, as is the practice internationally, left to the discretion of the valuer because the uniqueness of mineral properties requires some judgement in the process of deciding on appropriate value estimates. In addition to resource/reserve definition, the Code gives guidance when reporting mineralized stope-fill, remnants, pillars, stockpiles, dumps and tailings. It also has commodity-specific reporting requirements for coal and diamond deposits.

Competence

The values of evaluators of mineral resources and reserves are pertinent when dealing with evaluation issues and it is little wonder that evaluation codes internationally link competence of practitioners with registration at professional bodies. In South Africa the SAMREC Code defines a Competent Person (CP) as '...a person who is a member of the South African Council for Natural Scientific Professions (SACNASP), or the Engineering Council of South Africa (ECSA), or the South African Council for Professional Land Surveyors and Technical Surveyors (PLATO), or any other statutory South African or international body that is recognized by SAMREC.' The administration of this requirement is left to the professional bodies to control, e.g. PLATO expects surveyors to be registered as Professional Mine Surveyors before 'licencing' them as competent in terms of SAMREC. Apart from the above-mentioned registration, SAMREC proposes that Competent Persons 'should have a minimum of five years experience, relevant to the style of mineralization and type of deposit under consideration and to the activity which that person is undertaking'. The appropriateness of the competence definition can be questioned as follows:

- What level of registration is required?
- Is it necessary to prescribe additional courses in technical evaluation and/or financial valuation of mineral properties?
- Is it really necessary for five years experience per mineral type in addition to, say, professional registration?

Financial mine valuation

Unlike public reporting of resources and reserves that are governed by the SAMREC Code, there is no guide for the reporting of financial valuation practices in South Africa. Macfarlane (2002) proposed a strategy towards developing a South African (SAMVAL) Code, which was accepted by the South African Institute of Mining and Metallurgy and culminated in a colloquium during which the issues were discussed (SAIMM, 2002). Financial valuation of mineral properties entails attaching a monetary value to the property. The *Oxford English Dictionary* is specific in its description of valuation, which reads '...an estimation (especially by a professional valuer) of a thing's worth'. Mineral property valuation has its roots in property valuation, which includes the valuation of land, buildings and other immovable property assets. Valuation relates to the estimate of the price

of a property for sale, while analysis is carried out after the purchase in order to assess the correctness of the valuation as measured against the price paid. Appraisal covers both valuation and analysis. Open-market value is universally considered as the best price at which a property might reasonably be expected to be sold by private treaty at the date of valuation assuming:

- A willing seller
 - A reasonable period within which to negotiate the sale
 - Values will remain static throughout the period
 - The property will be freely exposed to the market
 - No account is to be taken of an additional bid by a special purchaser.
- (According to Isaac and Steley, 2000)

Constituents of value in South Africa

Humphreys (1983) investigated the perspectives of value and classified them under three main headings:

- The non-renewability of mineral resources, hence the need to treat minerals as capital stock
- The effort it takes to produce minerals, hence the importance of the economics of mineral extraction
- The perception that mineral resources are national assets, which results in government involvement in order to optimize the role of mineral development in the national economy.

Central to these perspectives are the notions of mineral resource management and economic value added through excellence and innovative practices. There are many constituents of value, which include:

- The concept of mineral rent
- Quality and quantity of the mineral resource
- The information available to decision makers
- Level of beneficiation
- The magnitude of uncertainty and risk associated with mineral development and the corresponding discount factor
- Applied technology in production
- Mine design issues
- Quality and flexibility of management.

Government policies, societal values and the nature of the markets are especially relevant in the South African context and are discussed in some detail in this section.

State policies

Government policies have a significant impact on mineral property value. One only has to look at the difference in value before and after taxation to appreciate how important tax policy is to the field of mineral property valuation. Governments view *in situ* minerals as national wealth, which evokes political debate and impacts on mineral development. Humphreys (1983) pointed out that the laws governing mineral rights, mining practice and fiscal regimes are almost always at national level, mostly because of the United

Valuation means

- 'The act of determining value...'
- 'Formal assessment of property...'

Collins Dictionary

Towards a mineral property valuation code: Considerations for South Africa

Nations' doctrine of the state's sovereignty over natural resources. The principal act governing taxation in South Africa is the Income Tax Act No. 58 of 1962. The first tax policy instrument to consider is the corporate mining tax rate, which fluctuated significantly over the years in South Africa, as indicated in Table I. The reason for the significant reduction in company taxes over the last decade is the government's commitment to reduce corporate taxes to internationally competitive levels.

The Eighth Schedule† made Capital Gains Tax (CGT) effective from 1 October 2001 and introduced tax on gains upon the disposal of mineral assets for the first time in South Africa. CGT has an interesting impact on value because it is in the interest of the owner that the initial 1 October 2001 value must be as high as possible, contrary to the past practice where mineral rights were sometimes valued at unrealistically low or nominal value, in an attempt to keep transfer and estate duties as low as possible. It will no longer be in the property owner's long-term interest to undervalue assets in an attempt to reduce short-term taxes. A CGT event occurs when assets are disposed of or when ownership changes and it will therefore be necessary for mines to attach a value to all assets (including surface title and mineral rights) on the mining property.

Other tax issues are the implication of residence-based taxation on worldwide income for both domestic and foreign mining companies with international interests, double taxation agreements or tax treaties and, most importantly, the way capital write-off schemes affect mine value. Mine development costs can currently be written off immediately, while current depreciation schedules for plant and equipment average about twenty per cent per year. In terms of the 2002 State Budget, provision was made for an accelerated depreciation allowance for manufacturing plants and machinery, where forty per cent of the cost will be deducted

in the first year and the remaining costs over three equal annual instalments.

Cabinet approved the new White Paper on a Minerals and Mining Policy for South Africa on 23 September 1998. The policy contains a statement on government's commitment to create a macro and regulatory environment conducive to economic growth and development. In developing mining tax policy, government has committed itself to a consistent and stable tax regime with an internationally competitive aggregate rate of tax. The intent of the new minerals policy in South Africa with regard to mining taxation, is to 'maintain and promote a stable legal and fiscal climate that does not inhibit the mining industry from making the fullest possible contribution to the national, provincial and local economy' (Minerals Policy, 1998, p. 7). Reference is also made to the Katz Commission of Inquiry that is currently investigating taxes in South Africa. The Commission is considering a number of tax issues and is expected to report on redemption of capital expenditure in mining, capital allowances for gold mining, ring-fencing, tax deductions for exploration, a tax on mineral rights, and the extension of the gold-mining formula taxation to other types of mining. With regard to mineral rights, the policy states that government will change the current system of mineral rights ownership with as little disruption to the mining industry as possible. The release of the new Minerals Policy resulted in a scramble by owners to secure their legal rights. The result was that the Deeds Office recorded over 10 800 transactions from 1 January 1999 to September 2001. Figure 1 illustrates how political actions affected the registration of mineral contracts and sales in the South African Deeds Office. Many of these 'transactions' involved owners and mineral investors securing their positions before the enactment of the new Mineral and Petroleum Resources Development Bill, which will implement the policy statements made in the Mineral Policy.

Table I

Evolution of South African mining income taxes

YEAR	Gold mine income taxes (excluding lease consideration)	Income tax for other mines (%)
1910	10% (standard tax)	Diamonds: 10% Other: 2.5-6%
1936	20% with profit adjustment + 10% surtax or $y = 40 - 500/x$ (all inclusive)	15% + 10% surcharge = 25%
1970	Pre-1966 : $y = 60 - 360/x$ Post-1966 : $y = 60 - 480/x$ Small mine: $y = 20 - 120/x$ Assisted mine: $y = 68 - 601/x$	Diamonds: 45-54% + 5% duty Other: 30-50% + 5% duty
1989	Pre-1966 : $y = 75 - 450/x$ Post-1966 : $y = 75 - 600/x$	Diamonds: 45% +25% surcharge Other: 50 + 15% surcharge
2002	$Y = 46 - 230/x$ or $y = 37 - 185/x$ plus 12.5% STC	30% + 12.5% STC

Note: $x = (\text{Profit} + \text{Revenue}) \times 100$

Source: Cawood (1999), updated

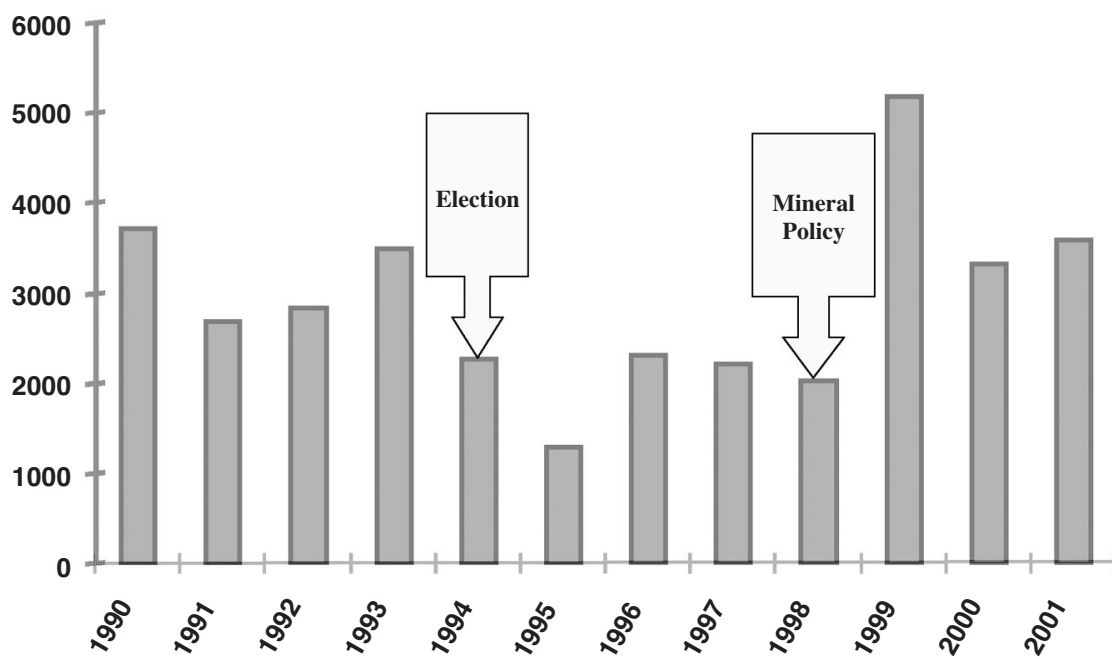
†CGT and the issues governing the valuation of assets for CGT purposes, were promulgated by The Eighth Schedule to the Income Tax Act No. 58 of 1962, introduced by the Taxation Laws Amendment Act No. 5 of 2001, the amendments affected by the Revenue Laws Amendment Act No. 19 of 2001, and the amendments effected by the Second Revenue Laws Amendment Act No. 60 of 2001.

The Eighth Schedule defines assets as follows:

'asset' includes-

- (a) property of whatever nature, whether movable or immovable, corporeal or incorporeal, ...
- (b) a right or interest of whatever nature to or in such property"

Towards a mineral property valuation code: Considerations for South Africa



Source: South African Deeds Office

Figure 1—Number of mineral contracts registered in the SA Deeds Office

Societal values

These are driven by environmental and social concerns and also impact on value because mine value must accommodate sustainable development costs. One such example appears in Chapter 2 of the Constitution (1996), which deals with Restitution of Land Rights Claims. A person or a community can claim restitution of a right in land when rights were dispossessed after 19 June 1913 on grounds of racial discrimination. These provisions do not apply to any rights in land expropriated under the Expropriation Act No. 63 of 1975, or any other law, if just and equitable compensation was paid at the time of expropriation. Subsequent events led to the establishment of a Commission on Restitution of Land Rights, which is responsible for investigating the merits of any claims, mediation and settlement of disputes arising from claims and administering the Restitution of Land Rights Act No. 22 of 1994. During the process more than 63 000 claims were lodged, of which many have not been finalized, mainly because of value disputes.

The markets

Supply and demand dynamics determine the clearing price for mineral production. The price for mineral production has a significant impact on value because value can only be added when the sales revenue exceeds the sum of total cost and the required return on investment after discounting for inflation and risk. The discount rate at which the annual cash flow calculation of a mineral property is discounted, includes geological, technical, environmental, financial and political risks. The factor in itself has an impact on value, which is clearly reflected in the range of net present values obtained from a cash flow where all other variables, except for the discount rate, remain unchanged. To maintain or expand value amidst declining mineral prices constitutes a major challenge, especially when it occurs in conjunction with an

ever-changing domestic and international investment environment. Figure 2 illustrates how prices for South African mineral production has declined in real terms. It shows the ratio, expressed as a percentage, of the total mineral sales (nominal terms) for all commodities to physical production tonnage, adjusted inflation using 1990 as the base year.

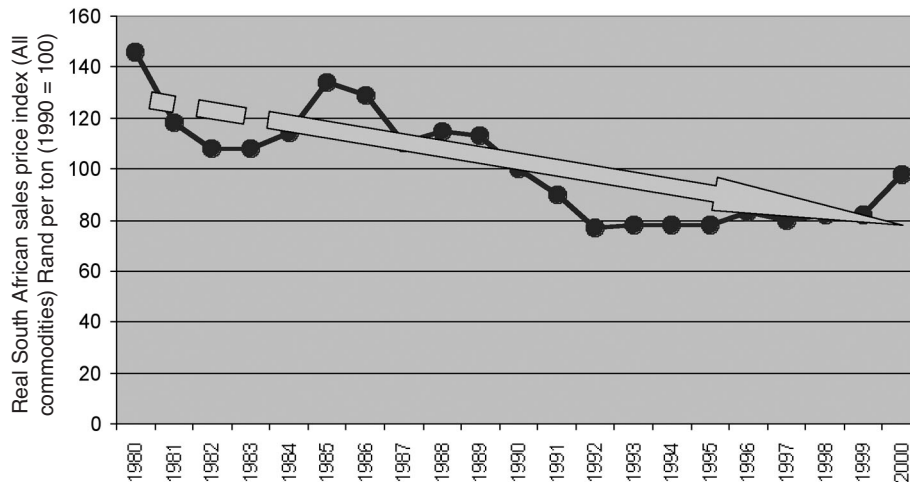
In order to maintain mine value in such difficult market conditions, efficiencies need to be increased through new technologies. This means that the relationships between the factors of production (land, labour, capital and entrepreneurship), and the ways in which these are innovatively employed to unlock value, become significant drivers of value. In a demanding business environment, one should always remember that competent (good or even best) practice only maintains value. In order to create value, there needs to be creativity, innovation and entrepreneurial skill—in short, excellence. The opposite also holds true, that is, bad practice destroys value.

An unusual property market

An understanding of the property market is extremely important for valuing mineral properties and legal rights in South Africa. This is because:

- The unique ownership and distribution of mineral rights allows for complex mixes of state and privately owned mineral rights (Cawood and Minnitt, 1998)
- Unique combinations of option, prospecting and lease agreements are available to investors
- One mineral property is often a collection of tangible and intangible properties, which assets are secured by a multitude of legal rights
- Management may add or destroy significant value through management styles and flexibility in decision-making

Towards a mineral property valuation code: Considerations for South Africa



Source STATS SA (2001)

Figure 2—Cyclical nature of South African mineral markets

- There are local, provincial, national, regional and international considerations
- There is an inefficient market for these mineral properties where prices and values differ substantially**.

Reasons for this inefficiency are:

- *Absence of mineral property valuation standards*—although some of the more sophisticated methods of mineral evaluation and valuation have been applied historically, there were no standards until SAMREC published its guidelines. South Africa is yet to take the SAMREC Code to the next level of valuation, that is the conversion of technical evaluations to dollar or rand valuations.
- *Lack of data on market transactions*—the South African Deeds Office is currently not able to supply transactions affecting mineral rights and properties as part of a standard request for information. Consequently there is currently no comprehensive information system on values for these properties.

- *Secrecy of valuation information*—private and state mineral property valuers are reluctant to release detailed valuation information to the market because these values and their support information are often regarded as strategic.
- *Lack of homogeneity in mineral assets*—mineral properties all differ in terms of their stage of development, mineral quality, quantity, ease of extraction and location. These differences add to the complexity of valuing these properties.
- *Lack of liquidity in the property market*—the first reason for poor liquidity can be ascribed to a lack of a central marketplace that is able to manage all mineral rights and mineral property transactions, resulting in localized markets for these assets. Another reason is high transaction and entry costs to the market. A classic example is 'owners' of mineral rights whose inherited rights are worth less than the legal registration costs required to legally transfer these rights in their names. This is especially problematic when there is a later discovery or mining interest on the property.
- *Legal rights*—which are the pillars on which security of tenure rests, are difficult to value because of the special value their holders attach to them and because the costs of mine development overshadow their value.
- *Limited freedom*—of entry into, or exit from, the market because of legal, financial, taxation, national and international constraints.

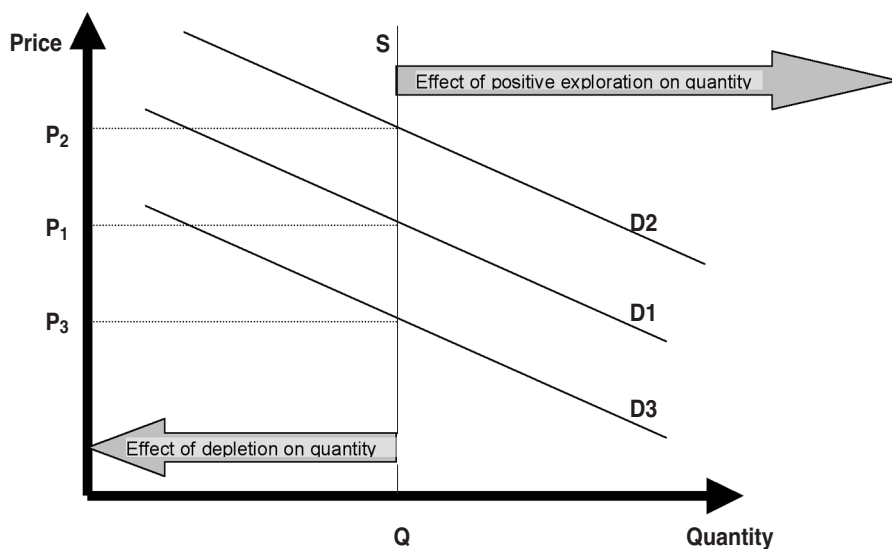
**The Table below shows examples of variations in value for comparable mineral properties. In an efficient market the values for comparable mineral properties would be similar, irrespective of the purpose of the valuations.

Discrepancies in values for same property but for different purpose				
Farm No	District	Date	R/Ha	Purpose
408JR	Pretoria	1998	0.89	Estate duty
408JR	Pretoria	1996	41.37	Transfer duty
522IQ	Potchefstroom	1996	10.00	Transfer duty
522IQ	Potchefstroom	1998	2599.09	Transfer duty
416IP	Potchefstroom	1998	13.06	Estate duty
416IP	Potchefstroom	1986	1800.00	Transfer duty
315JS	Middelburg	1997	0.99	Estate duty
315JS	Middelburg	1998	1556.31	Sales Transaction

Source: Personal database

As a consequence of the unusualness of the market, the supply of mineral properties is inelastic, as indicated in Figure 3. The figure shows economic supply (S) and demand (D) and is based on the observations of the commercial property market by Isaac (2002). The figure shows that the short-term supply of mineral properties is fixed and a sudden increase in demand will cause a price increase from P1 to P2. The price will decrease (from P1 to P3) when demand suddenly drops. The change in price is noticeably more than what it would be when the market is more elastic with the usual upward sliding supply curve.

Towards a mineral property valuation code: Considerations for South Africa



Source: Isaac (2002), altered to accommodate the market for mineral properties

Figure 3—Short-term market characteristics for mineral properties

Mineral properties are products of a process by which mineral resources are prospected and mines developed for the production of minerals. Their owners have two options: to mine for their own benefit or to make the property available for lease or sale. A property offered for sale is driven by a short-term profit motive. The profit margin (or return) depends on the nature and expectations of the owner. In the minerals industry this would typically be an exploration company whose ability to access finance determines to what stage the property will be developed. When an owner elects to retain the property, the decision is based on the long-term profitability of the mine within the property. The return on the investment is then greatly influenced by the way it is managed and the entrepreneurial talent of management. This is especially important in the characteristically cyclical mineral property market.

International practice

As with technical evaluations, the Australian and Canadian examples are discussed and compared to the South African situation. The reader must note that there are valuation codes other than the Australian and Canadian examples reviewed in this paper. Examples are the Uniform Standards of Professional Appraisal Practice (USPAP) in the United States and the Royal Institute of Chartered Surveyors (RICS) Appraisal and Valuation Manual Red Book of the United Kingdom (RICS, 1994).

One must realize that recent developments in accountancy should also be considered in conjunction with international valuation developments. From an accountancy perspective, there is internationally a trend away from Generally Accepted Accounting Principles (GAAP) towards International Financial Reporting Standards (IFRS), better known as International Accounting Standards (IAS). As a consequence of these developments there is now, greater acceptance of accounting to 'fair value' instead of the 'historic cost' malady, which over the years has proved to be

an unreliable indicator of value, and growing acceptance of the need for international, instead of national, valuation standards.

Australian influence

The Australian 'Code and Guidelines for Technical Assessment and/or Valuation of Mineral and Petroleum Assets and Mineral and Petroleum Securities for Independent Expert Reports' (the VALMIN Code) has become the international benchmark for financial valuation of mineral properties. The VALMIN Code was first adopted by the AusIMM on 17 February 1995, updated on 22 November 1997, and applied to all relevant reports required under the Corporations Law issued on or after 1 April 1998. The fundamental principles of the VALMIN Code are transparency, independence, competence and materiality. VALMIN regards mineral assets as '...all property including but not limited to real property, intellectual property, mining and exploration tenements ... together with all plant, equipment and infrastructure owned or acquired for the development ... Most mineral assets can be classified as either Exploration Areas, Advanced Exploration Areas, Pre-Development Projects, Development Projects or Operating Mines.'

Value, according to VALMIN '... is the 'Fair Market Value' ... and is the estimated amount of money ... for which ... (a mineral asset) ... should change hands on the Valuation Date, between a willing buyer and a willing seller in an 'arm's length' transaction, wherein each party acted knowledgeably, prudently and without compulsion. Value is usually composed of two components, the underlying or 'Technical Value' ... and a premium or discount relating to market, strategic or other considerations.' This definition applies equally well to the South African situation.

Commissioning a valuation report under VALMIN

The first step is for the valuer and commissioning entity to

Towards a mineral property valuation code: Considerations for South Africa

enter into a written agreement specifying the terms governing the preparation of the report, which should cover the following aspects:

- Date, scope and purpose of the valuation, specifying any limitations on its use for other purposes
- Acknowledgement of independence and competence (qualifications and relevant experience) of valuer
- Description of assets to be valued
- The assumptions about technical and commercial parameters and the significant risks arising from them. The valuer must illustrate the effect of variation in these assumptions on the value and determine a range of values reflecting uncertainties in the data and the interaction of the various assumptions. A sensitivity analysis should guide the valuer in the decision to determine the range of values. The preferred value (or best estimate) must be stated in the report
- Specialist opinion and reports
- Sufficient information on the valuation method(s) used, which must be such to allow professionals using the report to make informed decisions
- A balanced, objective and concise statement of the review and conclusions
- The source of all material information and reference to other material used. The valuer has the right to use his/her own information in addition to that supplied by the commissioning entity
- Maps, plans and other graphic documents to illustrate the location, geology, infrastructure and legal rights. Availability of services, infrastructure required for mining, environmental requirements, ease of land access, and existence of native title could all influence the final value
- The valuer should inspect the site and where a mineral asset has not been inspected, the report must contain reasons for non-inspection. The valuer must be satisfied that there is sufficient current information available to allow an informed decision without inspection.

Canadian influence

The first step towards a Canadian Code was the release of National Instrument 43-101 (NI 43-101), which standards for Disclosure of Mineral Projects were enforced from 1 February 2001. The objective of NI 43-101 is to provide scientific and technical information on mineral exploration, development and production activities on a mineral property that is material to an issuer. At the time of writing this article, the Canadian Valuation Code was not yet finalized and this section is a review of the Draft Paper by the CIM Special Committee on Valuation of Mineral Properties (CIMVAL) of February 2002. CIMVAL adopted the five main principles of the VALMIN Code as fundamental, which principles are transparency, materiality, competence, independence and reasonableness. These are self-explanatory, but materiality deserves special mention, as it is defined as '... data and information which contribute to the determination of the mineral property value, such as the inclusion or omission (thereof) ... might result in the reader of the valuation report coming to a different conclusion...' (CIMVAL, 2002).

The guideline for the qualifications of valuers states that persons valuing mineral properties must be appropriately qualified in terms of relevant education, training and experience. CIMVAL (2002) draws a distinction between a Qualified Person (engineer or geoscientist) and a Qualified Valuator (a professional) by stating that the Qualified Valuator (who may be assisted by, or rely on information supplied by the Qualified Person) takes overall responsibility for the valuation report. It continues with a recommendation that any such person must have at least five years experience in the valuation of mineral properties and be a member of good standing of a self-regulatory professional organization.

The Canadian Securities Regulators National Policy 2-A controls valuation reports and their submission to Canadian Provincial Securities Administrators. CIMVAL states that reports must be factual and any recommendations must be supported by information given in the report. Sources of information must be clearly stated in the report and properly referenced. Where experts prepared or certified any section of the report, their written consent for including that into the report must be obtained, which consent must accompany the report. Whenever it is reasonable and practical, the author must inspect the property reported upon. CIMVAL (2002) recommends that the contents of valuation reports be structured under the following headings:

- Introduction
- Definitions
- The scope of the valuation
- Compliance with the standards and guidelines
- Property location, access and infrastructure
- Property ownership, status and agreements
- History of exploration and production
- Geology and mineralization
- Recent exploration results and potential
- Mineral reserves and mineral resources
- Mining and processing operations
- Key assumptions and risks
- Valuation approaches and methods
- Valuation
- Certificates (stating qualifications of valuer/s)
- Valuation conclusions

Competence required for South African valuations

Section 12 of the Johannesburg Stock Exchange Act (JSE Act) deals with 'Mineral Companies' and their valuation. The definition of mineral company includes both exploration and mining companies. The Act accepts the standards embodied in the SAMREC Code for reserve and resource reporting classification and relies on the integrity of the Competent Person (CP) to provide accurate and independent analysis of the information gathered for the valuation. The Act defines a Competent Person as 'a person who is registered with any one of SACNASP, ECSA, PLATO or any other statutory South African or international body that is recognized by SAMREC.' Apart from the above-mentioned registration, the JSE Act requires Competent Persons to 'have a minimum of five years experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which that person is undertaking'. The guiding principles for all CPs' reports are as follows:

Towards a mineral property valuation code: Considerations for South Africa

- SAMREC compliance
- Full disclosure of information
- Independence of CP
- Assessment by a third party
- Disclosure of references.

The JSE Act distinguishes between CP reports for exploration and mining companies, which must contain the following information:

- The personal details, qualifications, relevant experience, independence and professional registration of the CP
- The nature, interest in or relationship between the valuer and the commissioning entity
- The valuation date, which must be less than six months prior to the publication of the report
- Exploration results, including a mineral resource/reserve statement and a statement on the integrity of sample assays. Mining companies must also disclose the technical information contained in SAMREC checklists concerning modifying factors and an annualized cash flow forecast covering all project, mine economic and financial parameters detailed in section 12.14(b) of the JSE Act
- Details of the Environmental Management Programme (EMP) as required by the DME
- A list of the mineral, surface and other legal rights affected. These must refer to maps and plans indicating location, extent and principal geological features
- A statement on any legal proceedings that may influence the valuation
- A detailed estimate of the cost of the valuation.

The South African Council for Valuers

Valuers registered at the South African Council for Valuers are regulated by the Property Valuation Profession Act No. 47 of 2000, which requires registration of professionals for the valuing of any immovable property, which includes '...a right in respect of, or an interest in immovable property'. This definition includes land, mineral rights, servitudes, rights of use, buildings and other assets, but excludes technical evaluations on the chief asset of any mineral property, namely the mineral resource. There are several advantages in having a controlling body for maintaining standards for the valuation of the various categories of immovable property. Standardization means that valuation methods can easily be aligned with best practice, in addition to defining competence for the various categories of immovable property. This is especially important when overlaps in competencies occur, as is typical of mineral properties because of the 'bundle of legal rights and properties' that need valuation.

Conclusions

This paper introduced the reader to the issues relating to mineral property valuation in South Africa and identified the need to align domestic mineral property valuation practice with international standards. Whilst the SAMREC Code deals with best reporting practice, there is a need for a similar code for valuation issues. In the absence of a valuation code, one can expect large variations in values for comparable mineral properties, depending on the purposes for which they were valued.

The current drivers for mineral property valuations in South Africa are state policies, such as mineral and taxation codes, societal values introducing the concept of sustainable development to the field of mineral property valuation, and the market with its supply and demand dynamics. These drivers set the scene for an unusual and inefficient mineral property market characterized by secrecy, a unique ownership distribution, and complex combinations of legal rights over properties ranging vastly in economic potential. Much can be learned from codes such as VALMIN and CIMVAL, but South Africa's unique situation requires new thinking to meet the domestic challenges and to align domestic practice with international standards.

Acknowledgement

This research was conducted with the support of the Deepmine Collaborative Research Programme. The views expressed do not necessarily reflect those of Deepmine or its sponsoring organizations.

References

- CAWOOD, F.T. Determining the optimal rent for South African mineral resources. Ph.D. Thesis, University of the Witwatersrand, Johannesburg, 1999. Appendices and p. 221.
- CAWOOD, F.T. and MINNITT, R.C.A. A historical perspective on the economics of the ownership of mineral rights. *Journal of the South African Institute of Mining and Metallurgy*, Johannesburg, South Africa. vol. 98, no. 7 November/December 1998. pp. 369–376.
- CIMVAL. Draft Standards and Guidelines for Valuation of Mineral Properties. Special committee of the Canadian Institute of Mining, Metallurgy and Petroleum on Valuation of Mineral Properties, February 2002.
- Constitution of the Republic of South Africa, Act 108 of 1996.
- HUMPHREYS, D. *The value of mineral resources: Perspectives and conflicts. Resources Policy*, Butterworth & Company (Publishers) Ltd. September 1983. pp. 19–24.
- ISAAC, D. *Property valuation principles*. Palgrave, Hampshire, England. 2002. p. 235.
- ISAAC, D. AND STELEY, T. *Property valuation techniques* (2nd edition). Macmillan Press Limited, London, 2000. p. 219.
- JORC. *Australian Code for Reporting of Mineral Resources and Ore Reserves*, updated 1999 and 2001. Available from AusIMM www.jorc.org. 1996.
- MACFARLANE, A.S. A code for the valuation of mineral properties and projects in South Africa. *Journal of the South African Institute of Mining and Metallurgy*. vol. 102, no. 1, January/February 2002. pp. 37–48.
- White Paper on a Minerals and Mining Policy for South Africa. Department of Minerals and Energy, Pretoria, October 1998. pp. 10–65.
- One year on, *Mining Journal*, London, 20 March 1998. p. 227.
- National Instrument 43–101. Standards for disclosure for mineral projects. Available from www.osc.gov.on.ca/en/Regulation/Rulemaking/Rules/rule_ni43101_001117.html. 2000.
- Royal Institute of Chartered Surveyors (RICS) *Appraisal and Valuation Manual Red Book of the United Kingdom*. 1994.
- Colloquium: Valuation of mineral projects and properties: An African Perspective. The South African Institute of Mining and Metallurgy, Johannesburg, 19–20 March 2002.
- SAMREC. South African Code for reporting of mineral resources and mineral reserves. The South African Institute of Mining and Metallurgy, Johannesburg, March 2000.
- STATS SA. *Mining: Production and Sales*. Statistics South Africa, Pretoria, Statistical release P2041, December 2001.
- STORRAR, C.D. *South African Mine Valuation*. Chamber of Mines of South Africa, Johannesburg, 1981. pp. 470.
- USPAP. Statement of Uniform Standards of professional Appraisal Practice. 2000. ◆

World iron ore production reaches record high*

New report analyses supply and demand worldwide

A new report from market analyst Roskill says that 2002 saw world production of iron ore at a record high of just over 1000 Mt, as crude steel production exceeded 900 Mt for the first time. *The Economics of Iron Ore* (5th edition, 2003) says that this is not an indication of booming global demand for steel but a reflection of the huge and largely unexpected growth in steel production and consumption in China since the start of the decade.

According to the report, the tonnage growth in China's steel output since 2000 is roughly equivalent to annual production in the USA. Although China has a very large iron ore industry, its output has long been insufficient to meet domestic demand and the country is heavily dependent upon imports, which doubled to 112 Mt between 1999 and 2002 and were 44% higher in the first quarter of 2003 than in the same period the previous year.

Supply likely to remain tight

This rapid growth appears to have taken the world's iron ore producers by surprise and, coming at a time when steel production in most other countries is also growing, has eliminated any surplus of iron ore output and exerted upward pressure on prices. Roskill's report says that, although iron ore producers are moving to bring new capacity on-stream, the supply situation is likely to remain tight for the next two or three years, and an estimated 100 Mtpy of new capacity is required in the fairly short-term. Worldwide, some 190–200 Mtpy of production capacity is in the pipeline, principally in Australia and Brazil. Between 2003 and 2005 up to 115 Mtpy will be brought into production, most of it towards the end of the period.

Not all the planned capacity increases are additional capacity: a significant proportion is intended to replace existing operations with almost depleted reserves. Roskill forecasts that steel demand will continue to rise in the medium term but at reduced rates, and the supply-demand balance for iron ore will be restored in the third quarter of the decade.

Africa to gain greater importance

Roskill says that there are unlikely to be any major changes to the pattern of world supply in the immediate future. Ten countries dominate world production and the supply to world markets is even more tightly controlled through seaborne trade. In the longer term Africa is set to gain greater prominence as a producing region, with South African output set to grow by 10 Mtpy by the end of the

decade. The return to peace in Liberia could also see the rehabilitation of its iron ore industry, which once produced over 10 Mtpy for export.

Main producers join forces

Recent years have seen a spate of merger and acquisition activity that has concentrated much of the world's iron ore production capacity in the hands of a very few corporate groups. Brazil's CVRD was the world's leading producer even before it began to take control of the country's other miners in the late 1990s. Now almost complete, the company's acquisition programme has given it control over an estimated 95% of Brazil's iron ore production and all of its pellet capacity. In Australia, Rio Tinto, which already owned the iron ore giant Hamersley, became the world's second largest producer in 2000 when it gained control over Robe River Iron Associates. In 2001, BHP merged with Billiton after failing to join its iron operations with those of Rio Tinto.

Dominant companies push through price rises

Roskill says that these three companies are now responsible for 30% of world iron ore production and 70% of global exports. This dominance creates a strong bargaining position in the price negotiations that are conducted annually between the iron ore producers and steelmakers in Western Europe and Japan—regions that depend very heavily on imports from Brazil and Australia. In 2001 a weak global steel market forced iron ore producers to accept price cuts of 2.5 to 5.5% in the 2002 price negotiations.

Early in the 2003 negotiations, steelmakers were demanding further cuts, arguing the case of continued lacklustre market conditions. Iron ore producers were pushing for increases, and industry analysts were predicting a rise in prices of only 2% to 3%. When the first contract was eventually agreed, in mid-May, the increase was much higher than expected. CVRD's contract to supply Arcelor with 16 Mt of fines was at a price 9% higher than in the previous year and other producers quickly followed suit. Producers were able to push through these increases on the back of high steel prices and very strong demand for iron ore in China.

The Economics of Iron Ore (5th edition, 2003) is available at £1500/US\$3000/€2625 from Roskill Information Services Ltd, 27a Leopold Road, London SW19 7BB, England. Tel: +44 (0) 20 8944 0066. Fax: +44 (0) 20 8947 9568, E-mail: info@roskill.co.uk ◆