



A Code for the valuation of mineral properties and projects in South Africa

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Synopsis

The South African Institute of Mining and Metallurgy was approached by the Australian Institute of Mining and Metallurgy to present a paper on the current practice in terms of the valuation of mineral projects and properties, given the development of a Code for the Valuation of Mineral Properties, developed in Australia (the VALMIN Code), and a similar Code in Canada (the CIMVal Code).

This paper is the result of research and investigation into the matter, in terms of the reporting of Mineral Resources and Reserves, financial reporting practice, the Listing Rules of the Johannesburg Securities Exchange, and various practices in valuation.

The paper establishes that a strong linkage has already been established between the SAMREC Code for the reporting of Mineral Resources and Reserves and the Listing Rules, and that, for completeness, a Code for Valuation needs to be developed.

This Code will be similar to its international counterparts, with the necessary inclusions which are relevant to South Africa, and will provide guidelines and definitions on matters such as transparency, materiality and competency in valuation.

It proposes that a multi-stakeholder steering committee be established under the auspices of the SAIMM, to deliberate and design a process for establishing such a Code.

Introduction

The South African minerals industry has undergone substantial changes in recent history, largely as a result of globalization and restructuring. These happenings have been necessitated by, or been the result of, global competition in an industry subjected to severe margin squeezes. The restructuring and globalization of companies has resulted on the one hand in the emergence of new companies, mergers and joint ventures, and on the other in listings on foreign bourses. These actions have attracted a new set of speculative investors, different from the traditional institutional investor base. The result of these issues has been a need for regulation and standardization of reporting according to good international practice, and transparency, linked to accurate and reliable forecasting. Companies in South Africa have moved towards the use of International Accounting Standards for

analysis and public reporting, and the SAMREC Code for Mineral Resource and Mineral Reserve reporting has been developed through the auspices of the South African Institute of Mining and Metallurgy (SAIMM), and largely adopted by the industry. Furthermore, the listing requirements for mining companies under Section 12 of the JSE Securities Exchange have recently been modified to deal with and incorporate these issues.

As has been the case in Australia and Canada, where the VALMIN Code has been developed, and the CIMVal Code is in the process of development, South Africa now needs to complete the process relating to the development of a code for mineral property valuation, linked to the SAMREC Code and the Listing requirements, which can be used by South African and foreign mining companies investing in South Africa, and which fits into the global standards that have been developed, while at the same time catering for local needs.

It is the purpose of this paper to describe the current situation in South Africa with regard to valuation of mineral properties, and to suggest a way forward. The paper is based on a limited number of opinions, canvassed from as wide a range as possible, in terms of involvement in the issue. It is a fact that uncertainty and a degree of secrecy still exists in terms of reporting and valuation in South Africa, as evidenced by the limited number, and wide variety of response. These concerns are fuelled currently by the issues of globalization, international competitiveness, impending Capital Gains Tax and fundamental changes expected in the definition of mineral property rights. It is, therefore, not based on exhaustive research: this process, as part of a wider consultative process will begin in earnest, once a base strategy has been formulated.

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The current situation

The current situation in South Africa is one which is in a process of transition. Companies and organizations are gradually moving towards international standardization, as a result of the requirements for off-shore listings, and to establish simpler, transparent and user-friendly information for potential international investors. These moves come against a background where the minerals industry has been a major contributor to the economy, through its contribution both to the fiscus, and to the Gross Domestic Product of the country.

During times of isolation, large corporate structures dominated the mining industry, providing critical mass to support the industry economically, and latterly to provide critical business mass to influence the path of the country towards political transition.

Furthermore, during the period 1948 to 1994, the minerals industry was of strategic importance to the country in terms of currency exchange rates, foreign exchange earnings, and, to an extent, a hedge against sanctions and their effect on the protected economy.

This was manifested through taxation policy, which provided incentives for investment, through the ability of companies to write off capital expenditure for mine establishment, against operating profit, in the year in which it was incurred.

This appropriation method is still in effect, and continues to provide such incentive for investment, but is not in line with general international practice.

In addition to taxation, lease payment was required, which provided further income to the State. This lease consideration was payable regardless of mineral rights ownership. The lease consideration justified compensation to the State for the loss of certain strategic 'reserved' minerals, such as gold, diamonds, uranium and oil, and must not be confused with the international mineral royalty, which is a payment to the State for the minerals it owns. The lease consideration over privately owned mineral rights was abandoned in December 1992, two years after the introduction of Act 50 of 1990. The abolition of the old lease system resulted in mines no longer being required to mine according to their average payable grade, which opened the door for more business-like strategies to be introduced, focusing more on sound economic principles.

In the gold industry in particular, further incentives for investment, and the sustainability of the gold industry, were provided by a sliding tax scale, based on profit to revenue ratios, and applicable to tax and lease payments.

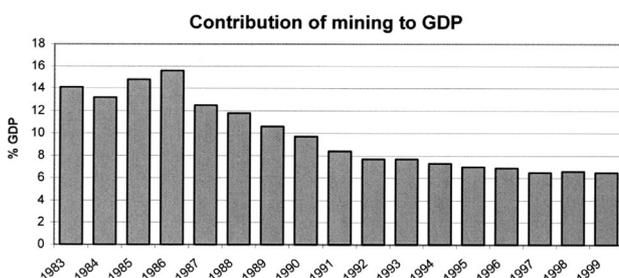


Figure 1—Contribution of mining to GDP in South Africa, 1983-1999

Further capital allowances for investment in deep level mines, were and are still available, at a rate of 12% of capital expenditure, to be written off against operating profit, for a period of up to ten years after expenditure.

Most mining projects were funded during this time on an all-equity basis, taking advantage of these various allowances and tax breaks, although debt finance offered the opportunity to provide further tax shields through interest payments being tax deductible. However, high interest rates during these times would generally make the cost of debt capital prohibitively high, by comparison to equity under the prevailing circumstances.

During the 1990s, monetary and fiscal policy changed in driving the country towards a free market economy, gradually aligning itself with the global economy. This resulted in relaxation in foreign exchange regulation, free market influence on inflation and interest rates and a lesser reliance on the minerals industry within the economy (largely through development of other industries and changes in State expenditure needs).

These transitions have had a profound effect upon the minerals industry, particularly with regard to:

- Financing of mineral projects, in terms of increasing debt financing
- The shareholder profile, changing to more speculative investors seeking equity growth
- The structure of companies, changing to simpler, flatter organizations
- Financial reporting becoming aligned with international requirements
- Transparency of information to a more demanding audience
- Listing requirements, both locally and internationally
- Valuation methodology, becoming transparent and aligned to best practice
- Competitiveness, in the global arena, for funds
- Globalization and its effect on markets and the development of the industry in southern Africa
- Changes in mineral rights and tax legislation
- Changes to environmental legislation, based on the value of competing land concept.

Despite these developments, many aspects peculiar to South Africa remain for the time being. These need to be recognized, in terms of their effect on valuation issues, and in terms of the need to change or influence these in the future, to come into line with international best practice, and the continuing globalization of the industry.

This section will explore the current situation with regard to some of these issues in more detail, in particular:

- Company structures
- Financial reporting
- Resource and Reserve classification
- Listing requirements
- Valuation methodologies
- Independent reports
- Other circumstances peculiar to South Africa.

Company structures

Two effects have been prominent in terms of company structure in South Africa, namely the simplification of large

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corporations into operating divisions, with a clarification of ownership and accountability, and divestment of interest by large companies, and the emergence of new and junior companies, either as public or private companies, sometimes operating as joint venture partners, often as a means to 'empowerment' of previously disadvantaged sectors of the population.

The simplification process has also resulted in rationalization of mineral rights ownership, manifested in asset swaps and sell-offs of rights.

This activity is being given added impetus through the intended effects of the Draft Minerals Development Bill of 1999 and the Minerals Policy Document of 1998, which intend to return ownership of mineral rights to the State, as well as promoting new entry into the sector.

This intent includes the establishment of a system of penalty for the under-utilization of mineral rights, and possible expropriation in order to pass ownership to emerging or existing companies, who could turn un-utilized rights to account.

This, coupled with desires to develop economic empowerment in previously disadvantaged sectors of the population, has stimulated the need to build capacity in terms of entrepreneurship and to establish fair valuation practices for the transactions that result.

These activities have resulted in numerous instances where valuation of mineral properties has become important, amongst them:

- ▶ The establishment of small, private mining companies, who have to develop feasibility studies and valuations of exploration, potential or operating projects, in order to raise debt finance
- ▶ The acquisition, sale or merger of small to medium mining or exploration companies or ventures, which require fair valuation based on willing seller/willing buyer principles
- ▶ An increasing number of joint venture and other 'farm-in/farm-out' activities, which require terms and conditions to be established based on fair valuation
- ▶ Asset swaps and rationalization of mineral rights. Historically, the mineral right boundaries have been based on surface rights ownership boundaries, literally farm fences. Rationalization is complicated by these restrictions, whereby third parties (surface rights owners) require compensation or rent through royalties or some other form of income, always based on projections of future earnings of the mine operator
- ▶ Other complications include tribute and service

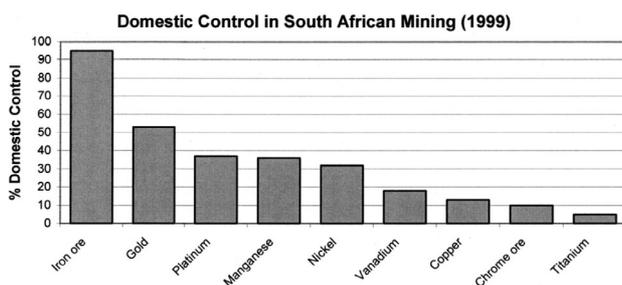


Figure 2—Domestic control in South African mining

agreement type arrangements, which also require valuation of future earnings as the basis for setting profit ratios, income distribution and the allocation of residual liabilities

- ▶ Tribal ownership of rights, and the redistribution or restitution of these has become particularly important, as evidenced by the Bafokeng nation case involving Impala Platinum, in recent times. In extreme cases this could result in expropriation, but in either case royalty calculation and/or compensation must be based on valuation.
- ▶ Changes in ownership, asset swaps, mergers, etc., carry residual tax-related issues, created by the tax structure. For example, the appropriation method of accounting for capital redemption may result in unredeemed capital shields, which have to form part of the valuation process, and be part of the establishment of fair value
- ▶ Other taxation issues, such as 'ring fencing' removal, whereby tax write-offs were restricted to expenditure and income within prescribed geographical boundaries, require justification through valuation of future cash-flow streams
- ▶ Ownership changes, coupled with environmental protection requirements, necessitate the incorporation of residual liability for environmental restitution, to be built into any current transaction, by way of establishment or transfer of trust funds established out of cash-flow for the purpose
- ▶ The impending (October 2001) introduction of Capital Gains Tax
- ▶ Environmental legislation requiring valuing of competing land uses for government decision-making
- ▶ Good practice and due diligence in all these matters, should require that independent assessment is included as part of the process of the transaction, not only for public companies, but also for private companies. This is increasingly the case.

Various standards exist for dealing with these activities, namely:

- ▶ Adherence to the International Accounting Standards (IAS)
- ▶ Adherence to Generally Accepted Accounting Principles (GAAP)
- ▶ Adherence to the SAMREC Code for Resource and Reserve reporting
- ▶ Adherence to the JSE Securities Exchange Listing Requirements
- ▶ Adherence to requirements of the Companies Act
- ▶ The Expropriation Act of 1975
- ▶ Various Acts and Ordinances in terms of property valuation, at National and local authority level.

Financial reporting

South African companies, since more transparent reporting became necessary, have generally used the GAAP principles as a guideline for reporting.

For a company to be listed in an overseas country, it is now preferable for the company to comply with the International Accounting Standards (IAS) instead.

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The International Organization of Securities Commissions (IOSCO) requested the International Accounting Standards Committee in 1996 to develop a set of mutually acceptable International Accounting Standards, which are now being developed further in terms of a project set up in 1998 to deal with Accounting for the Extractive industries.

As mining companies have changed their focus from primarily domestic projects and shareholders towards international investments, it has become increasingly important for these companies to prepare financial reports that are not only accepted and understood in the country of incorporation, but which are internationally comparable and, ideally, allow listing on a foreign stock exchange.

However, companies in South Africa are still subject to taxation regulations which provide for appropriation.

As a result, although tax is physically paid on this basis, dual reporting is the norm, based on both appropriation and amortization of capital, in IAS format.

The following summary describes current practice, in terms of reporting.

Exploration, development and construction expenditure

Accounting practice deals with exploration and development on a cost basis. This requires either carry-forward of costs, or write-off of expenses, dependent on the perceived viability or promise of the project. In this regard, entities involved in exploration activities tend to carry forward expenditure until:

- ▶ The project is abandoned, when the expenditure is written off
- ▶ The project advances to the development stage, when it is transferred to a development asset
- ▶ The project is sold.

Asset write-downs are increasingly common in South Africa, but were previously uncommon. It is interesting to note that asset write-downs do not invoke the kind of equity holder displeasure that they should: perhaps herein lies a scenario for the future.

Production reporting

As with exploration and development, all expenditure up to the point of achieving commercial levels of production must be capitalized and appropriated. This includes pre-production costs, and establishment costs, which are written off against operating income before tax, for tax purposes.

Where companies amortize these costs in order to comply with IAS, the determination of the changeover to commercial levels of production is based on a range of criteria such as percentage of design capacity achieved, continuous production and so on.

Once in production, expenditure is expended in the period in which the product is sold or loses its value.

Cash cost reporting in terms of the Gold Institute Standard has been adopted in the gold industry, and increasingly in other mineral sectors.

Business combinations

Accounting and reporting of business combinations (acquisitions, mergers, etc.) should be done on the basis of fair market value.

This requires that fair market value be assessed as the amount for which the asset could be exchanged or a liability

settled between knowledgeable, willing parties in an arms-length transaction.

IAS 22 establishes principles which are applied, but there is a large amount of flexibility in South Africa governing accounting of acquisitions. This may include different methods of accounting for issues such as goodwill, and exploration.

An issue here is the definition of an *asset*, and how its value is ascertained: cost or future value in terms of cash-flow. This issue requires resolution, since it may result in erroneous valuations if they are based on balance sheet entries, which are derived from costs.

Limited statutory guidance is given in the Companies Act.

Joint ventures

South African companies conform to IAS 31—Financial Reporting of Interests in Joint Ventures—which defines joint ventures as all contractual arrangements 'whereby two or more parties undertake an economic activity which is subject to joint control'.

Depreciation and amortization

Due to the fact that most mining companies in South Africa use the appropriation method of accounting, there are no charges for amortization or depletion of reserves.

The principle applied is that mining is a wasting asset, and therefore there is no need to keep funds to finance the replacement of the mining facility, and that shareholder's funds are invested in the wasting asset and the cost of mining assets over and above the initial capital is provided out of profits earned.

This method allows early capital redemption, and serves as an incentive for investment.

The move to IAS however, as noted previously, now means that companies are increasingly reporting on both an amortization and appropriation basis.

It remains to be seen whether mining taxation policy will change in line with this.

(It is the opinion of the author that in due course, it should).

Inventory

Due to the usage of the appropriation method of accounting, no account is taken of inventory in process.

The costs associated with the build up of inventory at start-up are capitalized and appropriated. Once in commercial production, only finished products are accounted for.

Revenues

Revenue reporting in South Africa complies closely with IAS 18, which requires that revenue is recognised when there has been a transfer of the significant risks and rewards of ownership, and when the amount of revenue and the costs incurred, can be reliably measured, and when the flow of future economic benefits is probable.

There is no clear statement on the valuation and reporting of hedging, other than the requirements for disclosure.

Closure and rehabilitation

South African companies accrue for these costs, through establishment of trust funds.

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Resource and reserve classification

South Africa has developed and adopted the SAMREC Code for the reporting of Resources and Reserves in recent years. The Code and its development are described below and it has become a requirement that competent persons reporting in terms of Section 12 comply with the SAMREC Code. The development of the Code began in 1992 when a committee, under the auspices of the Geological Society of South Africa, and the Geo-statistical Society of South Africa, developed a draft Code for reporting of resources and reserves, following a request to do so by the Council of Mining and Metallurgical Institutions (CMMI).

The draft Code was presented at the CMMI congress in 1994, but failed to gain acceptance from all quarters, notably the JSE and the Chamber of Mines of South Africa.

An *ad hoc* committee was formed by the CMMI subsequently, to develop a set of definitions for the reporting of resources and reserves, comprising representatives from the United States, Australia, Canada, United Kingdom and South Africa.

Agreement was reached on a common set of definitions at a CMMI International Definitions Group meeting in Denver, in 1997, which was subsequently endorsed by the United Nations Economic Commission for Europe (UN-ECE), as their standard for the UN Framework Classification, at a joint meeting held in Geneva between the CMMI International Definitions Group, and the UN-ECE Task Force on Resource and Reserve definitions.

Following the 'Denver accord', The South African Institute of Mining and Metallurgy (SAIMM) constituted the South African Mineral Resource Committee (SAMREC) in January 1998, for the purpose of compiling a South African Code, to be known as the South African Code for the Reporting of Mineral Resources and Mineral Reserves (the SAMREC Code).

The Code incorporates the definitions agreed at the Denver accord, and is consistent with the principles and structure of the Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC Code).

The development of the Code involved the participation of a wide spectrum of stakeholders, including representatives of:

- The SAIMM
- The South African Council for Natural and Scientific Professions
- The Geological Society of South Africa
- The Geostatistical Association of South Africa
- The South African Council for Professional Land Surveyors and Technical Surveyors
- The Association of Law Societies of South Africa
- The General Council of the Bar of South Africa
- The Department of Minerals and Energy
- The JSE
- The Council for Geoscience
- The South African Council of Banks
- The Chamber of Mines of South Africa.

The Code has been endorsed by the SAIMM and the SAMREC member organizations, and the Code is now incorporated into Section 12 of the listing rules of the JSE.

During the process of development of the Code, drafts were sent regularly to equivalent committees in Australia, the United Kingdom, the United States, Canada and the United

Nations, in order to ensure consistency with other Codes, while at the same time ensuring that local requirements were also addressed and incorporated in such a way as not to compromise the intent of producing a document that was consistent with international practice.

Main elements, intent and concepts embodied in the SAMREC Code

The Code is intended to represent the minimum acceptable standard for reporting of Resources and Reserves.

It is therefore in the form of standards, recommendations and guidelines, with definitions as appropriate.

It relies on three key principles which govern the application of the Code, these being transparency, materiality and competence.

Transparency requires that the reader of a public report is provided with sufficient clear and unambiguous information. Materiality refers to the requirement that the report contains the relevant information that is required for the purpose of the reader, while competence relies on suitable qualification and experience of the person compiling the report.

The main aspects of the Code are contained in the appendix, but are essentially as follows:

- The definitions for Resources and Reserves, respectively
- The incorporation of economic viability as the fundamental factor for classification
- The adoption and description of the 'modifying factors', in accordance with the Denver accord
- The incorporation of the concept of confidence levels in classification
- Mineral Resources being inclusive or exclusive of Mineral Reserves
- The qualifications and duties of the competent person
- The accreditation of foreign professionals.

Additionally, the Code contains seven major definitions, which comply fully with the definitions of the Denver accord, these being:

- Mineral resource
- Inferred mineral resource
- Indicated mineral resource
- Measured mineral resource
- Mineral reserve
- Probable mineral reserve
- Proved mineral reserve.

Definitions are also included for 'public reports' as well as 'competent person', since these have domestic as well as international relevance.

In terms of valuation issues, these two definitions are of particular relevance.

'A public report or public reporting is a report or reporting on exploration results, mineral resources or mineral reserves, prepared for the purpose of (a) informing investors or potential investors and their advisers, or (b) satisfying regulatory requirements. Companies are encouraged to provide information which is as comprehensive as possible in their public reports.'

'A "competent person" is a person who is a member of the South African Council for Natural and Scientific Professions (SACNASP), and/or the Engineering Council of South Africa

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(ECSA), and/or South African Council for Professional Land Surveyors and Technical Surveyors (PLATO) or any other statutory South African or international body that is recognized or may be approved by SAMREC. A competent person 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. If the competent person is estimating, or supervising the estimation of mineral resources, the relevant experience must be in the estimation, assessment and evaluation of mineral resources. If the competent person is estimating or supervising the estimation of mineral reserves, the relevant experience must be in the estimation, assessment, evaluation and economic extraction of mineral reserves.'

These definitions, linked to the requirements for transparency and materiality, and the conversion of Resources to Reserves through the modifying factors, place increasing emphasis on economic and valuation issues. This is particularly important for the compilation of competent persons reports, or independent assessments that are required during mergers/acquisitions or other forms of business combinations, as well as for listings.

It is against this increasing requirement that the JSE reviewed its listing requirements, and established the linkage between these and the Code.

The new JSE Listing requirements : Section 12

As mentioned earlier, during the compilation of the Code, the JSE began drafting a new set of listing rules for mineral companies, which were then promulgated in September 2000.

These listing rules adopted the Code in its entirety for the public reporting of Resources and Reserves, in order for this reporting to be consistent with international practice.

The listing requirements further require that:

- ▶ Competent Persons must comply with the Code and must ensure that the information that is presented is of such standard that they should be clearly satisfied in their own minds that they could face their peers and demonstrate competence in the commodity, type of deposit and situation under consideration

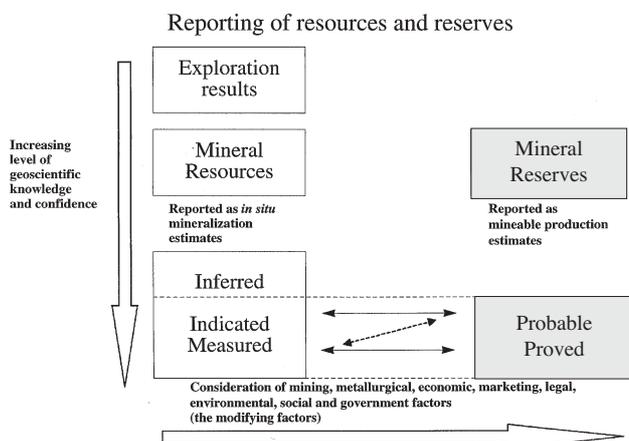


Figure 3—Intent and definitions embodied in the SAMREC Code

- ▶ They should also be satisfied that their reporting has ensured full disclosure by the entity commissioning its work of all material information that might prejudice the integrity and accuracy of the information that is being reported upon. No information should be disclosed which could mislead the readers of the report with respect to the commercial prospects of the projects being reported upon
- ▶ They should also be satisfied that their work has not been unfairly influenced by the commissioning entity as a result of unfair pressure over fees, time or future rewards
- ▶ Individuals and companies that prepare and report under this section under the guidelines of the Code should be aware that, as part of the JSE approval process, the JSE Listings Division will be referring all Competent Person's reports to an independent technical reader's panel constituted by SAMREC for assessment and comment. Any material complaints concerning a Competent Person will be referred by SAMREC to the JSE Listings Division for disciplinary action by the body under which they are registered as professionals.

The process which is described in the last paragraph (extracted from the Listing rules), is as shown in Figure 4, and the disciplinary procedure implied by it is as shown in Figure 5.

Of significance in terms of valuation, is that the Listing requirements, in the case of both exploration and mining companies, refer extensively to the inclusion of economic factors used both in the SAMREC 'modifying factors' as well as financial information used in the costing or cash-flow estimates.

In the case of exploration companies, this includes a detailed estimate/statement of:

- ▶ The exploration funding requirements for at least two years following publication of the Competent Person's report
- ▶ The exploration expenditure incurred to date and/or budgeted for
- ▶ The projected adequacy of capital raised for exploration purposes.

This is of particular significance to valuation of these companies, since common practice is to value these operations on a cost/expenditure basis, or on a mineral content basis.

In the case of mining companies, the requirements are more specific with regard to valuation, viz:

'Notwithstanding disclosures made in terms of paragraph 12.14(a), the Competent Person's report must include annualized forecast free cash flow mining valuation numbers and all key criteria and assumptions made in arriving at such valuation, which shall include in tabular form, without limiting the generality thereof, that portion of the life of the mine, stated in years, as determined by the Competent Person for valuation purposes (for which there are reasonable prospects that the Mineral Resources and Mineral Reserves can sustain the relevant life of mine cash flows), and for each such life-of-mine year, the following:

- ▶ Expected run-of-mine tonnage and grade to be mined
- ▶ A reconciliation of the grade and tonnage of the Mineral Reserves (fully diluted to plant) back to *in situ* Mineral Reserves

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- Recovery factors showing final grade recoveries reconciled back to Mineral Reserves delivered to plant
- Revenue receivable per final defined product unit sold and in total (for the year)
- Mining, beneficiating, smelting, refining, marketing, environmental and any other cost categories per defined unit (e.g. run of mine tonne, reef tonne, recovered unit) and in total (for the year)
- Capital expenditure, differentiating between initial, new and ongoing capital expenditure
- Expected salvage value of assets less liabilities including environmental liabilities at the end of the cash flow valuation
- Taxation, royalties and other similar charges (providing pertinent descriptive details where relevant)
- Unredeemed capital expenditure balances and assessed losses
- Expected interest and finance costs
- Changes in working capital and consequent cash flow implications
- An estimate of all funding requirements and funding movements, differentiating between debt, equity and internal resources
- Repayment of long-term loans and debt
- Final net free cash (for each year)
- Range of real or nominal discount rates used to discount the free cash flow per annum and consequent net present values
- The net present value per share or unit used for final valuation purposes
- Economic assumptions such as exchange rates, interest rates, inflation rates, escalation and de-escalation rates and any other relevant factors, and
- The specific terms of any forward sale or hedging contracts entered into.'

These provisions have thus established a linkage between the Resource and Reserve reporting, and the valuation of their exploitation in terms of cash flow analysis in feasibility studies.

The intent here is again that the principles of transparency, materiality and competence are carried through to valuation, although these are not explicitly stipulated in the requirements. To do so, will require the development of an appropriate valuation Code, which will define these issues in mineral property valuation.

Valuation methodologies

Currently, South Africa does not have a Code for valuation, such as the VALMIN Code, or the proposed CIMVal Code.

The author undertook a survey of current practices, based on responses from operating companies, analysts, bankers, academics, government agencies and other interested parties.

Although this survey was a very preliminary assessment, and therefore not fully comprehensive or statistically representative, it did give some useful information on which to estimate the status quo in mineral project valuation.

Table I shows a summary of most commonly used methods, for various types of assets and their valuation.

In addition to these, properties with no history of exploration are valued on a R/ha basis, on market comparables with similar transactions over the same mineral potential, or on a nominal rate approach.

This is particularly important in the light of the fact that under South African legislation, mineral rights and surface rights may be separated, and end in separate ownership. This becomes interesting when surface rights are expropriated or repossessed, and the mineral rights are then separated out, but with no indication of value.

In terms of assessing a broad description of current South African practice, Table II shows the situation by development stage and purpose.

The analysis shows a preference for discounted cash-flow techniques, at any stage where sufficient information is available for conducting a meaningful exercise.

This analysis is in broad agreement with practices worldwide, which are illustrated in the following Tables, III and IV, taken from practice reported in Canada. The comparison is valuable, since it shows that current practice in South Africa, although not formalized or regulated, aligns internationally, and therefore will allow the development of a Code based broadly on the *status quo*.

The survey showed that while there is no specific Code other than SAMREC and the Section 12 Listing requirements, there is a large degree of commonality of approach, which can be summarized as follows.

- Companies or organizations conducting valuations generally use more than one methodology for valuation, in order to mitigate against any risks or shortcomings in a particular methodology. For

JSE ⇌	Samrec ⇌	Panel of readers ⇌	Panel of readers ⇌	JSE ⇌	Samrec ⇌
Refers draft prospectus to Samrec	Nominates readers	Reader signs agreement /contract relating to confidentiality, conflict of interest, responsibilities and deadlines	1. Reader reviews and checks for compliance with the Samrec Code and JSE rules. 2. Recommends to JSE modifications, acceptance or rejection	1. Acknowledges Readers report and recommendations 2. Refers back to applicant company/competent person and requests revision 3. Assures anonymity of readers 4. Accepts/rejects reviewed document for listing 5. Informs Samrec of all outcomes	1. Co-ordinator reviews prospectus/report ito recommendations to JSE. 2. Recommends to the JSE modifications, acceptance or rejection.

Figure 4—SAMREC review procedure in terms of Section 12 of the JSE Listing requirements

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Complaint	Samrec Committee	Statutory body
Complaint may be either iro competent person's report specifically, or interpretation/ use of reserve and/or resource in prospectus (misuse of CPR) or procedural non- compliance or gross negligence or others.	Evaluates complaint to determine if breach to SAMREC and/or JSE has occurred. Report type and magnitude of breach and refers to JSE who refer to respective statutory body.	SACNASP, ECSA, PLATO Evaluates complaint and decides on procedures and sanction according to its own Code and regulations Informs SAMREC of decision.

Figure 5—Disciplinary procedure adopted by SAMREC

example, whilst within a DCF analysis, both IRR and NPV would be calculated in order to deal with the limitations of each, cost methods and market comparables would also be used. Furthermore, sensitivity analysis establishes a range of possible outcomes.

- The methodologies to be applied are dependent on the availability of information. Thus, exploration property valuation is more often based on multiples of expenditure or market comparable methods (based for example on \$/oz), because of the lack of confidence in the Resource statement (based on SAMREC), or on the projection of future cash-flows.
- Generally, DCF analysis is the preferred methodology for operations where future cash flows can be identified. However, the accuracy of analysis is entirely open to the accuracy of the input information, the assumptions applied and the discount rates used. Herein lies a concern that lack of competence or standards can very easily influence the outcome of these valuations, especially where two parties are entering into a negotiation for a sale or merger, where the motivation for the transaction is not common to both parties.
- Option pricing methods are not widely used at this stage in South Africa. They are generally reserved for valuations where information is scarce, as in the case of exploration properties.
- In the case of operating mines, real option pricing, despite the understanding that it values future management flexibility more adequately than DCF, is not often used. This is because of two factors. Firstly, its perceived complexity makes it unattractive to operating mine personnel. Secondly, larger companies feel that they will not attempt to find value in a project which has not stood up to the test of DCF. In other words, if a project is not sufficiently robust to be

acceptable in DCF terms, then it would not provide sufficient returns under an option pricing scenario. This assumes that sufficient sensitivity and risk analysis has been conducted to define sufficient confidence in the valuation outcome.

- Discount rates in South Africa may often be overstated. This is apparent while the country is in an economic cycle where inflation is declining, and where interest rates are also declining. Furthermore, risk premiums which are applied may result in double discounts where diligent risk assessment and mitigation has already been done on key input variables.
- The discount rates which are applied, are generally based on a Cost of Capital, when used for calculation of NPV. Whilst these should be based on the Capital Asset Pricing model for equity, and cost of debt, the more common practice is to use generic rates which are applicable to the particular company. Furthermore,

Type of asset	Most common methodology
Exploration properties	Multiple of expenditure; R/ha; \$/oz; market comparables
Unexploited mineral rights	Multiple of expenditure; R/ha; \$/oz; option pricing; tail ??-ounce
Resources and Reserves	DCF; option pricing; tail-ounce; R/ha; \$/oz
Property rights	Market value
Mining operations	DCF; option pricing; market capitalization/ounce
Fixed assets	Lesser of cost and net realizable value
Moveable assets	Lesser of cost and net realizable value
Property	Lesser of cost and net realizable value
Land	Lesser of cost and net realizable value
Liabilities	Appraised value
Goodwill	Difference between book and actual value
Share interests	Market value
Service agreements	Cost
Residual value	Salvage value; appraised value

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Table II

Common South African practice, at each stage or purpose of valuation

Development stage	Preferred methodology	Approach
Mineral Rights over virgin territory	R/ha market comparables or nominal rate	Market
Early exploration	Multiple of expenditure; R/ha or \$/oz market comparables	Cost/market comparables
Advanced exploration	Discounted cash-flow; option pricing	Income/option pricing
Pre-feasibility studies	Discounted cash-flow	Income
Feasibility studies	Discounted cash-flow	Income
Development stage	Discounted cash-flow	Income
Production stage	Discounted cash-flow	Income
Salvage or closure	Appraised value or historical cost	Cost/market comparables
Other applications		
Capital Gains Tax	Discounted cash-flow or DCF of dividend or royalty stream	
Transfer duty	Discounted cash-flow or DCF of dividend or royalty stream	
Environmental legislation	Discounted cash-flow or DCF of dividend or royalty stream	
Mergers and acquisitions	Discounted cash-flow or DCF of dividend or royalty stream	
Expropriation	Discounted cash-flow or DCF of dividend or royalty stream	

Table III

Common practice in valuation methods applied

Approach	Methods	Brief description of method
Cost	Appraised value method Historical cost method	Meaningful past exploration costs plus warranted future costs Cost less any outstanding obligations and/or depletion
Income	Discounted cash-flow analysis	The NPV of a stream of cash flows
Market	Comparable transactions Market capitalization per reserve or resource ounce Market capitalization per ounce of annual production Option agreement/JV terms	Similar properties should have similar value Total capitalization dollars divided by total reserve or resource Similar to above but based on production. The incoming participant agrees to make certain payments and/or expenditures on the property
Option pricing	Call option value Put option value	Allows flexibility, good for significant unknowns Allows flexibility, good for significant unknowns
Other	Gross contained metal value Statistical/probabilistic Geoscience factor method Decision tree analysis Rules of thumb	Tonnage x grade x price Probability factor applied to NPV of a theoretical deposit A methodology established by Kilburn using location, grade, geology and applying a factor to each category Utilizing traditional yes-no analysis and also applying a probability factor Back of the envelope analysis, e.g. \$15 per ounce in the ground

Source: CIMVal

Table IV

Valuation techniques typically applied at various stages of project life

	Property stage characteristic	Dominant methods
1	Very early stage exploration, (just above the level of 'moose pasture' with a few holes drilled with encouraging results)	Appraised value/cost approach, market comparables
2	Early stage exploration (with several holes drilled with encouraging results)	Appraised value/cost approach, market comparables
3	Late stage exploration (decision made to do a full bankable feasibility study, pre-feasibility already completed with positive results)	Discounted cash flow, market comparables
4	Early development (a full bankable feasibility study completed and the bank financing lined up; construction to begin in the next six months)	Discounted cash flow, market comparables
5	Late development (full completion to be reached in the next six months)	Discounted cash flow, market comparables
6	Producing mine	Discounted cash flow, market comparables
7	Late stage producing mine (reserves to be depleted in 2 years; limited further exploration potential)	Discounted cash flow, market comparables
8	Mine closed (equipment still on site, limited further exploration potential)	Salvage value

Minimum Acceptable Rates of Return, as hurdle rates, are often simply established as the Cost of Capital with a premium which reflects the company's aversion to risk. It is likely that these calculations for discount rates will become more critically derived, given the move to more debt finance, international financing and tighter projects.

- The principle of a willing buyer and a willing seller, operating at arm's length is, or should be, generally applied. If this is done, and the principles of transparency, materiality and competence are applied, fair market value should be derived, no matter what the purpose or intent of the valuation exercise.
- Essentially, all valuations which are in the public

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domain should be subject to these principles and standards, especially those which are regulated activities such as listings and mergers. In this regard, there is agreement that a Code which is in line with international practice, and which links the three aspects of Resource and Reserve reporting, Listing requirements and valuations, is necessary. This Code should embody principles and standards already developed in SAMREC, IAS and Section 12, as well as those already developed in other international Codes. The Code will also address those issues which are peculiar to South Africa.

- ▶ There is agreement that the Code should not be prescriptive on valuations methodologies to be used, but, like SAMREC, should establish principles and guidelines, and establish definitions for competency.
- ▶ Independent technical and valuation assessment should be incorporated into normal practice, especially in circumstances of hostility, but also as a check on the quality and accuracy of input variables, assumptions and risks.
- ▶ The Code will address valuations in the public domain, but, as with SAMREC, the content and intent should be extended to everyday practice, for both internal and external use. There should therefore, be clear audit trails for value, from Resource statements through to the Balance sheet, and the assessment of market value in the stock exchange.
- ▶ Independent valuation is also necessary for the assessment of salvage values, liability assessment, and valuations of inventory, stock, fixed and moveable assets. Definition and agreement are required as to the accounting methodology to be used in each or all cases (historical cost, book value, market value, etc.), and the treatment of depreciation.
- ▶ The issue of goodwill in transactions is one that has not been defined and described in transactions. The principle should be incorporated that goodwill is valued and amortized in the valuation process. A number of transactions have been conducted in South Africa, involving substantial components of goodwill, in the establishment of so-called empowerment companies.
- ▶ Value is placed on mineral properties, mineral rights, surface rights, property and royalties by the State, through the Department of Minerals and Energy. This is for the purpose of establishing value and compensation in the case of expropriation, and for establishing the value of State-owned rights and royalties, or for the purpose of establishing tax, lease or other rent type payments. Various methodologies are used for this purpose, and covered by various statutes and precedents. Clearly, in the interests of transparency and materiality, these situations must be adequately addressed within the Code for valuation, which would then include the input of professional property valuers engaged for these purposes.
- ▶ Property valuers have used royalty flows to estimate value of mineral properties in some circumstances. Whilst this is in line with professional valuation practice (The National Property Education Committee), this methodology is open to inaccuracy due to risk in future cash-flow and variation in future outputs, and is

inconsistent with the approach adopted by the Department of Minerals and Energy, which uses either capital statements of *in situ* reserves, or share valuations and ratios. Clearly these inconsistencies need to be addressed.

- ▶ Various guidelines have been developed, both within South Africa, and worldwide, on appropriate accuracy levels to be embodied in feasibility studies and valuations.

These accuracy levels are dependent on the quality of input information as well as its quantity. Normal risk management processes should ensure consistency in dealing with input parameter risk, linked to feasibility study level of detail required. Table V shows an approximate detail scale to be used as a guideline, but this appears to vary from company to company, although it is clear that a bankable feasibility study and valuation will require accuracy of all input parameters to be within 5%, and to have been the subject of substantial risk and sensitivity analysis, to the extent of having statistical confidence limits applied.

The derivation of these accuracy levels is done through critical assessment of the input variables, in order to reduce risk and uncertainty.

This is done through sensitivity analysis to identify key variables, with an increasing tendency to follow this with a simulation to assess confidence levels and the quantification of risk.

This is becoming increasingly important in order to assess the debt coverage that the project can sustain, especially from the financier's point of view.

Independent reports

Independent reports value mining assets using various methodologies, including discounted cash flow analysis and industry valuation benchmarks such as multiples of cash flows, earnings, production, resources and reserves. These valuation methodologies tend to consider historical information only in so far as it provides an indication of future performance, with the principle focus being on the prospects for the assets, in terms of the size and quality of future earnings and cash-flows.

Valuations cover mining assets, Mineral Rights, service agreements, share interests and liabilities, and the valuations are based on the technical data which is outlined in the report of the Independent Technical Adviser, which verifies the accuracy of the input information.

The interests of the independent advisers must therefore be taken into account in the development of a valuation Code.

Circumstances peculiar to South Africa

From the above analyses, it is clear that there is a need to develop a Code for Valuation for South Africa. This Code should embrace as many of the aspects which have been addressed in the VALMIN and CIMVal Codes as are applicable to South Africa, operating in a global environment, but it should also take cognisance of certain circumstances and issues which are peculiar to South Africa. Some of these are as follows.

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- The Draft Minerals Development Bill is currently under public scrutiny. The Bill has as its main aim the return of Mineral Rights to State ownership. The stated purpose of this is to open Mineral Rights access to a wider section of the community, and to stimulate investment into the small and medium scale mining sector. Implications of the Bill are that Mineral Rights should be utilized, and that dormant Rights should be redistributed.

From an economic point of view, this requires that Rights be valued, either from the perspective of valuing their feasibility, or from valuing for the purpose of expropriation.

Furthermore, the intent of the Bill has already seen the establishment and entrance of a number of new companies, either independently or as joint venture partners.

Under these circumstances issues relating to fair valuation become increasingly important, for valuation, expropriation and financing purposes.

- The circumstances described immediately above require that small mining companies conduct valuations and feasibility studies, for raising finance. The Valuation Code will need to take into account the requirement for these organizations that methodologies which require significant levels of external opinion, do not become prohibitively expensive, and thereby become self-defeating.
- Capital Gains Tax is to be introduced to South Africa in October 2001. In principle, any upgrading of information on Resources and Reserves implies an increase in value, which would then be liable for Capital Gains Tax upon realization of value. This aspect may also be self-defeating in terms of encouraging investment, and also requires that valuation take account of these issues. This will need to be investigated and catered for in the Code.
- South Africa, in terms of sustainable development of the minerals industry, must provide for 'social capital' for issues such as the prevalence of HIV/AIDS, increasing standards for environmental care, training and development, as well as dealing with residual risks and liabilities. The valuation of these aspects needs careful consideration.
- The taxation policy relating to appropriation has been covered in detail, and will result in clauses relating to capital appropriation, capital allowances, dividend valuation and other tax issues being incorporated. This also provides the opportunity to recommend changes in fiscal policy that are appropriate to international consistency in reporting and valuation.
- Under South African legislation, gleaned from Roman-Dutch Law, mineral rights are a limited real right in that they can be separated from the ownership of land, and transferred to a third party. However, this can only happen once the minerals have been separated from the land. This complication has to be taken into account in valuation of properties, where this separation can occur.

A summary of the circumstances in South Africa

The above analyses form the basis of the following summary of the situation in South Africa, with regard to mineral property valuations.

- The South African mining industry is on a fast track to globalization, not only in terms of corporate strategy of major companies, but also in terms of the effects on new emerging companies. Changes in economic, fiscal and regulatory policy internally are creating the need for consistent valuation, which is in line with international practice.
- Changes in ownership, and the change in structure of companies, requires a set of guidelines and rules that can be consistently applied.
- IAS is increasingly being adopted as the preferred method/benchmark for financial reporting. A number of definitions still have to be developed and incorporated, and these need to link to a Code for Valuation, such that financial reporting on mineral projects is consistent with international practice, Listings requirements, and other public reporting.
- The SAMREC Code has been adopted for reporting of Resources and Reserves, through a process which has ensured that it is consistent with international practice. It has been adopted and incorporated into the JSE Listing rules, which places South Africa in a leading position as far as valuation requirements are concerned, for listing purposes. The final linkage will be the development of a Code for Valuation.
- A review and disciplinary procedure has been developed for dealing with transgressions of the SAMREC Code and Listing requirements. There is some concern that the sanctions which may be imposed are inadequate, or difficult to apply in practice. Thus, there are views that the Code should embody more stringent regulations and sanctions, should malpractice or incompetence be discovered.
- The compilation of the SAMREC Code has been an inclusive process, although there are concerns from certain quarters that the process was not inclusive enough, and that the development of a Valuation Code will require input from quarters not previously considered. This includes, for example, the professional property valuer, the independent technical advisers, the Ministry of Finance, the auditors and so on.
- The Code must examine and define the competency requirements for a Competent Valuer. As with the Competent Person described in SAMREC, the Competent Valuer will be required to have requisite experience and qualifications, and be registered as a

Table V

Accuracy levels common in stages of project valuation

Type of feasibility study	Accuracy of capital cost estimates	Engineering completed	Suitability of DCF methodology
Exploration review	50%	nil	No
Order of magnitude study	40%	2-3%	Generally, yes
Advanced exploration studies	20-40%	3-10%	Yes
Pre-feasibility study	20%	10%	Yes
Feasibility study	10%	30%	Yes
Job control estimates	5%	50-70%	Yes

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competent mineral property valuer. The details of these requirements need to be established.

- The principles of transparency, materiality and competence must underpin the contents and intent of the Code for Valuation of mineral properties.
- The Code must be developed as a guideline, which is prescriptive to the extent of stipulating competencies, registration, accounting methodologies, accuracy levels, and formats. It will not be prescriptive on issues such as methodologies of valuation to be applied or other areas where discretion and flexibility are required.
- Residual inconsistencies must be highlighted. Where these are statutory, then the Code should identify and highlight these, with a view to influencing governmental policy, where it is in the interests of the stakeholders to do so.
- The Code should take account of circumstances peculiar to South Africa, and incorporate these. Other than this, the Code should use VALMIN and CIMVal as the base, recognizing the good work that has already been done in Australia and Canada, and recognizing the value of the international consistency already established through these documents.
- Accuracy levels for the stages of development of feasibility studies and analyses need to be developed, which should be embodied in the Code. This will be indicative of the degree of risk analysis that is necessary in arriving at a bankable feasibility study.

The way forward: the birth of the SAMVal Code

This paper, based on discussion and response to the issue of mineral property valuation in South Africa, was originally requested for presentation at the VALMIN Congress in Brisbane in October 2001.

Its research and compilation has identified the need for the development of a Code for Mineral Property Valuation for South Africa, which is consistent with international practice, and which takes account of local circumstances.

The paper will be presented in Brisbane, and will be published in the *Journal* of the South African Institute of Mining and Metallurgy.

The SAIMM would seem to be the logical custodian of the development of the Code, given its track record of the development of the SAMREC Code, and given its professional and independent, non-commercial status.

Publication is therefore intended to spark interest in the subject from a wide range of stakeholders, and to enlist participation in the formation of an inclusive committee structure to discuss and develop the new Code.

Such a committee will include, and not be limited to, amongst others:

- The SAIMM
- The mining companies
- The Chamber of Mines
- The Financial Institutions
- The JSE Securities Exchange
- The South African Council for Valuers
- Academia
- The Law Society and the Bar
- Independent advisers

- The Institute of Chartered Accountants
- The Learned Societies
- Etc.

A steering group and appropriate working groups will then be established to move forward on a schedule to be developed, which will ensure meaningful and measurable progress on the issue.

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