

**Reporting Mineral Resources and Mineral Reserves
in the United States of America**

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Technical and Regulatory Issues
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ABSTRACT

The Committee for Mineral Reserves International Reporting Standards (CRIRSCO) was formed in 1994 to promote development and adoption of international standards for estimation and reporting of exploration results, mineral resources and mineral reserves. The CRIRSCO standards have been accepted by most mining companies and professional societies worldwide. Market regulators from Australia, South Africa and Canada, require that these standards be followed when releasing public information. Among these requirements is the use of specific definitions for what constitutes exploration results, mineral resources and mineral reserves. If such information is publicly disclosed in must be estimated by a Competent or Qualified Person.

In the United States of America, public disclosures are regulated by the US Securities and Exchange Commission. The SEC does not recognize the CRIRSCO guidelines, and some of the SEC requirements for public release of information are materially different from those applicable in other countries.

The CRIRSCO definitions and the Competent Person requirements are reviewed and compared with those of the SEC. The organization of the SEC and its rule making process are briefly discussed. Ongoing efforts to bring the US regulatory requirements closer to those applicable in other countries are presented, as well as other activities which CRIRSCO is entertaining with the United Nations, the International Accounting Standard Board and other international organizations to reach the objective of worldwide standardization of reporting procedures.

INTRODUCTION

Over the last twelve years considerable progress has been made towards worldwide standardization of requirements for estimation and reporting of exploration results, mineral resources and mineral reserves. The organization leading this effort is known as CRIRSCO, the Combined Reserves International Reporting Standards Committee, also known as the Committee for Mineral Reserves International Reporting Standards.

CRIRSCO was founded in Sun City, South Africa, in 1994 and serves as the industry body responsible for promotion of international best practices. Its current membership includes Australia, Canada, South Africa, the United States of America (US), the United Kingdom (UK), Ireland and other European countries, and Chile. In addition CRIRSCO is actively pursuing acceptance of uniform definitions with the International Accounting Standards Board (IASB), the United Nations European Commission on Energy (UN ECE) and the International Council of Mining and Metals (ICMM).

All professional organizations which represent the CRIRSCO member countries have accepted the CRIRSCO definitions of exploration results, mineral resources and mineral reserves. In addition these definitions have been accepted by the regulatory agencies of three of these countries, Australia, Canada and South Africa, and must be used when

publicly reporting information in these countries. With the exception of the US the CRIRSCO definitions are also accepted by, but not included in the reporting rules of the regulatory agencies of the other member countries.

In the US, the Society for Mining, Metallurgy, and Exploration, Inc (SME) recommends that the CRIRSCO definitions be used; and most mining companies are using these definitions for internal purposes. However the requirements of the US Securities and Exchange Commission (SEC), which regulates public reporting of resources and reserves in the US, are materially different from those applicable in other countries.

In this paper, the CRIRSCO definitions are reviewed. The SEC regulations concerning public reporting are summarized and compared with those applicable in other major financial markets. The SEC organization is described to the extent that it relates to the mining industry. An effort by the mining industry to move the SEC reporting requirements closer to those applicable in other countries is also discussed. Conclusions are drawn concerning likely trends for future reporting in the US and worldwide.

The reader of this paper should keep in mind that the requirements for public reporting of exploration results, resources and reserves vary from country to country as well as over time. The opinions expressed here are those of the author only. Companies publicly releasing information subject to US regulations or regulations applicable in other countries should seek the advice of security counsel before making such releases.

MINERAL RESOURCES AND MINERAL RESERVES

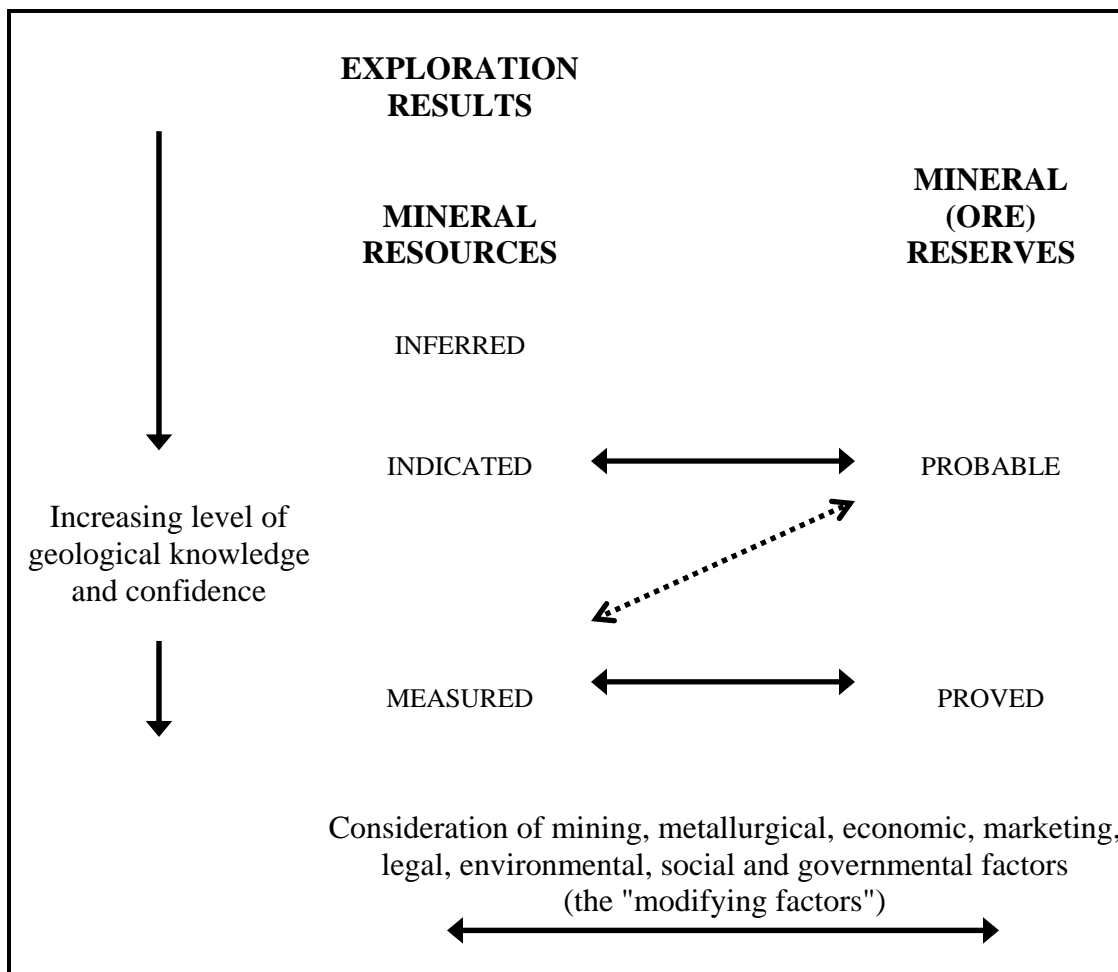
In this section definitions and guidelines are summarized which must be followed by companies whose public releases are made in countries whose regulators have accepted the CRIRSCO definitions. The text used in this and the next section is heavily borrowed from the JORC code which applies to companies subject to the rules and regulations of the Australian Stock Exchange (ASX). However the text has been modified for the purpose of this presentation and the reader should refer to the JORC code or other country-specific codes and regulations (such as NI43-101 in Canada and the SAMREC code in South Africa) before publicly releasing information.

According to the CRIRSCO guidelines, information reported by exploration and mining companies must be classified as belonging to one of the following categories: “exploration results”, “mineral resources” or “mineral reserves”¹. Mineral resources must be classified as inferred, indicated or measured, while mineral reserves must be classified as probable or proven. Figure 1 sets out the framework for classifying exploration results, mineral resources and mineral reserves. This classification reflects different levels of geological confidence and different degrees of technical and economic

¹ In this paper the terms “mineral reserves” and “ore reserves” are used interchangeably. However preferences and regulations concerning the use of these terms vary depending on the country in which the information is reported.

evaluation. Mineral resources can be estimated mainly on the basis of geoscientific information with some input from other disciplines. Mineral reserves, which are a modified subset of the indicated and measured mineral resources, require consideration of those factors affecting extraction, including mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors, and should in most instances be estimated with input from a range of disciplines.

Figure 1 – General Relationship between Exploration Results, Mineral Resources and Mineral Reserves



In certain situations, measured mineral resources could convert to probable mineral reserves rather than to proved mineral reserves because of uncertainties associated with modifying factors which are taken into account in the conversion from mineral resources to mineral reserves. This relationship is shown by the broken arrow in Figure 1.

In certain situations, previously reported mineral reserves could convert back to mineral resources because of new information according to which a mineral reserve can no longer

be reported. The resulting two-way relationship is shown by the two-headed arrows in Figure 1.

“Exploration results” include data and information generated by exploration programs that may be of use to investors. The reporting of such information is common in the early stages of exploration when the quantity of data available is generally not sufficient to allow any reasonable estimates of mineral resources. Examples of exploration results include results of outcrop sampling, assays of drill hole intercepts, geochemical results and geophysical survey results. With few exceptions, if a company reports exploration results in relation to mineralization not classified as a mineral resource or a mineral reserve, estimates of tonnages and average grade must not be assigned to the mineralization.

Public reports of exploration results must contain sufficient information to allow a considered and balanced judgment of their significance. Reports must include relevant information such as exploration context, type and method of sampling, relevant sample locations, land tenure status, plus information on any other relevant criteria. Public reports of exploration results must not be presented so as to unreasonably imply that potentially economic mineralization has been discovered.

A “mineral resource” is a concentration or occurrence of material of intrinsic economic interest in or on the Earth’s crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, geological characteristics and continuity of a mineral resource are known, estimated or interpreted from specific geological evidence and knowledge. Mineral resources are sub-divided, in order of increasing geological confidence, into inferred, indicated and measured categories.

Portions of a deposit that do not have reasonable prospects for eventual economic extraction must not be included in a mineral resource. It is the responsibility of the “Competent Person” to determine whether a mineral resource can be publicly released and to categorize the resource as measured, indicated or inferred. The term “Competent Person” is defined in the next section of this paper. Determining what constitutes a “reasonable prospect for eventual economic extraction” is arguably one of the most difficult decisions which must be made by the Competent Person. As will be discussed later in this paper, the SEC considers that the CRIRSCO definition of mineral resources leaves too much to the judgment of the Competent Person, opening the door to abuses.

A “mineral reserve” is the economically mineable part of a measured and/or indicated mineral resource. It includes diluting materials and allowances for losses, which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors (the modifying factors). These assessments demonstrate at the time of reporting that extraction could reasonably be justified. Mineral reserves are sub-divided in order of increasing confidence into probable mineral reserves and proved mineral reserves.

Mineral reserves are those portions of measured and/or indicated mineral resources which, after the application of the modifying factors, result in an estimated tonnage and grade which, in the opinion of the Competent Person making the estimates, can be the basis of a viable project. The term “economically mineable” implies that extraction of the mineral reserve has been demonstrated to be viable under reasonable technical and financial assumptions. What constitutes the term “realistically assumed” will vary with the type of deposit, the level of study that has been carried out and the financial criteria of the individual company. The role of the Competent Person is critical in assessing whether economic feasibility can be reasonably assumed. In order to achieve the required level of confidence in the modifying factors, appropriate studies must be carried out prior to determination of the mineral reserve. These studies must be based on a mine plan that is technically achievable and economically viable.

Rules and regulations which specify the studies that must be completed and the documentation required vary between countries. It is a responsibility of the Competent Person to be fully aware of all applicable rules and regulations before a mineral reserve is publicly released..

THE COMPETENT OR QUALIFIED PERSON

In Australia and South Africa it is required that exploration results, mineral resources and mineral reserves be estimated and reported by or under the responsibility of a “Competent Person”. The same requirement applies in Canada, except that the term “Qualified Person” is used instead of “Competent Person”. In this article the term “Competent Person” will be used.

A Competent Person is defined as an individual who:

- (1) is an engineer or geoscientist with at least five years of experience in mineral exploration, mine development or operation, or mineral project assessment;
- (2) has experience relevant to the subject matter of the mineral project and the technical report; and
- (3) is in good standing with a recognized professional organization which is a self-regulatory organization of engineers and/or geoscientists that admits individuals on the basis of their academic qualifications and experience, requires compliance with the professional standards of competence and ethics established by the organization, and has disciplinary powers, including the power to suspend or expel a member.

The list of recognized professional organizations varies from country to country as well as over time. Lists are published by the regulatory agencies and it is the responsibility of

the Competent Person to make sure that they belong to a professional organization which is recognized by the regulators of the country in which information is publicly released.

The key qualifier in the definition of a Competent Person is the word “relevant”. A Competent Person must have a minimum of five years experience which is 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 preparing a report on exploration results, the relevant experience must be in exploration. 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.

Determination of what constitutes relevant experience can be a difficult area and common sense has to be exercised. For example, in estimating mineral resources for vein gold mineralization, experience in a high-nugget, vein-type mineralization such as tin, uranium etc. will probably be relevant whereas experience in massive base metal deposits may not be. To qualify as a Competent Person in the estimation of mineral reserves for alluvial gold deposits, considerable experience in the evaluation and economic extraction of this type of mineralization would be needed.

The key word “relevant” also means that it is not always necessary for a person to have five years experience in each and every type of deposit in order to act as a Competent Person if that person has relevant experience in other deposit types. For example, a person with twenty years experience in estimating mineral resources for a variety of metalliferous hard-rock deposit types may not require five years specific experience in porphyry copper deposits in order to act as a Competent Person. Relevant experience in the other deposit types could count towards the required experience in relation to porphyry copper deposits.

As a general guide, persons being called upon to act as Competent Persons 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. If doubt exists, the person should either seek opinions from appropriately experienced colleagues or should decline to act as a Competent Person.

Estimation of mineral resources may be a team effort (for example, involving one person or team collecting the data and another person or team preparing the estimate). Estimation of ore reserves is very commonly a team effort involving several technical disciplines. If only one Competent Person signs the mineral resource or mineral reserve documentation, that person is responsible and accountable for the whole of the documentation. It is important in this situation that the Competent Person accepting overall responsibility for a mineral resource or mineral reserve estimate and supporting documentation prepared in whole or in part by others, is satisfied that the work of the other contributors is acceptable.

THE US REGULATORY ENVIRONMENT

The definitions and requirements discussed in the last two sections are not recognized by the US Securities and Exchange Commission. To understand the US regulatory environment it is helpful to review the SEC organization, the rules currently in effect, and how these rules are being developed and enforced.

The Securities and Exchange Commission has five Commissioners who are appointed by the President of the United States with the advice and consent of the Senate. Their terms last five years. To ensure that the Commission remains non-partisan, no more than three Commissioners may belong to the same political party. The President also designates one of the Commissioners as Chairman. The SEC is divided into four divisions which report to the Commission: the Division of Corporation Finance, the Division of Market Regulation, the Division of Investment Management, and the Division of Enforcement.

The division which regulates public reporting of exploration results, mineral resources and mineral reserves is the Division of Corporation Finance. Violations or possible violations of the reporting rules are referred to the Division of Enforcement. As of the time of this writing key members of the SEC and the Division of Corporation Finance were as shown on Figure 2.

Figure 2 – SEC Organization as it relates to Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves

<p>The Commission: Five Commissioners</p> <p>Appointed by the President of the United States for 5 Years Chairman: Christopher Cox</p>			
<p>Four Divisions</p>			
Division of Corporation Finance	Division of Market Regulation	Division of Investment Management	Division of Enforcement
<p>Division of Corporation Finance</p>			
Director, Division of Corporation Finance		John White	
Assistant Director, Office of Natural Resources and Food		Roger Schwall	
Senior Mining Engineer		Ken Schuler	
Senior Mining Engineer		Roger Baer	

The Division of Corporation Finance's mission is to see that investors are provided with material information in order to make informed investment decisions, both when a company initially offers its stock to the public and on a regular basis as it continues to give information to the marketplace. The Division also provides guidance to companies on SEC rules and forms and proposes new and revised rules to the Commission.

The Division of Market Regulation establishes and maintains standards for fair, orderly, and efficient markets. The Division regulates the major securities market participants, including broker-dealers, self-regulatory organizations (such as stock exchanges), and transfer agents.

The Division of Investment Management regulates investment companies (such as mutual funds), including variable insurance products, and federally registered investment advisers.

The Division of Enforcement investigates possible violations of securities laws, recommends Commission action when appropriate, either in a federal court or before an administrative law judge, and negotiates settlements.

The Division of Corporation Finance is divided into offices, of which the office of natural resources and food is responsible for regulations that apply to the mining, petroleum and food industries. It is a reflection of the relatively small size of the mining industry that responsibility for this sector of the financial market is shared with the petroleum and food industries.

SEC INDUSTRY GUIDE 7 AND STAFF INTERPRETATION

Before publishing exploration results, mineral resources and mineral reserves, companies which are subject to the rules and regulations of the SEC must refer to Industry Guide 7, "Description of Property by Issuers Engaged or to Be Engaged in Significant Mining Operations". This document was first published more than twenty years ago and has not been updated since then. However the staff of the SEC Division of Corporation Finance has significantly changed its interpretation of Industry Guide 7 over time to take into account other changes in the US and international regulatory environments. Mining and exploration companies which are subject to the SEC rules and regulations must understand not only the content of Industry Guide 7 but also, and arguably more importantly, the current staff interpretation of this content.

Industry Guide 7 applies to companies which are in the exploration, development or production stages. The terms "reserve", "proven (measured) reserve", and "probable (indicated) reserve" are defined. These definitions are similar to those recognized in Australia, Canada, South Africa and the UK, except that the terms "measured reserve" or "indicated reserve" are no longer recognized (and should not be used) outside the US.

However, even if the definitions are similar, the staff interpretation of these definitions is, in many respects, materially different from that of regulators from other countries.

In Industry Guide 7 the term “reserve” is defined as that part of a mineral deposit which could be economically and legally extracted or produced at the time of the reserve determination. The term “economically” is not defined but the staff of the SEC has interpreted it as requiring a feasibility study for new projects, and revised mine plans and cash flows for additions to existing properties. The term “legally” implies description of the legal conditions under which the property is held and can or will be allowed to be operated. Over the last few years the term “at the time of determination” has been interpreted as requiring current capital and operating cost estimates and, to the extent possible, a commodity price equal to the average price which prevailed during the last three years preceding publication of the reserve. For commodities sold under contract, such as coal and iron ore, the contract price must be used for the duration of the contract. Outside the US, management’s reasonable and supportable forward looking price estimates can be used for reserve determination.

The SEC does not recognize the term “resources”. Industry Guide 7 specifically states that:

“Estimates other than proved (measured) or probable (indicated) reserves, and any estimated values of such reserves shall not be disclosed unless such information is required to be disclosed by foreign or state law; provided, however, that where such estimates previously have been provided to a person (or any of its affiliates) that is offering to acquire, merge, or consolidate with, the registrant or otherwise to acquire the registrant’s securities, such estimates may be included.”

When material other than proved or probable reserve is published the staff of the SEC has requested that the term “mineralized material” or some similar term be used. The term “resource” must not be used. When reporting mineralized material, tonnages and grade or quality can be published but the amount of metal or mineral contained should not be reported by companies which are subject to SEC rules. Outside the US, mineral resources can be published if they are characterized as inferred, indicated or measured, and if inferred resources are published separately from indicated or measured.

Industry Guide 7 specifies that, when reports are submitted in support of the information being published, such as geological, deposit modeling, metallurgical, engineering or feasibility reports, the name of the authors of the reports must be included. The relationship between the authors and the company submitting the report to the SEC must also be stated. Industry Guide 7 does not state whether the authors of the reports should have specific qualifications or competencies. There is no requirement that the authors of the reports be independent from the company for which the report was prepared. Outside the US, publicly released information must be estimated by a Competent or Qualified Person and, depending on circumstances, independence of the Competent Person may be required.

THE SARBANES-OXLEY ACT OF 2002

The Sarbanes-Oxley act of 2002 (SOX) was passed by the Congress of the United States “to protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws, and for other purposes.” Some of the main objectives were to clarify and strengthen requirements for independence of financial auditors, to clarify and increase corporate responsibility for public disclosure, and to enhance the requirements for financial disclosure. Since this act was passed, the rules concerning public reporting have been significantly strengthened, and this process is still in the making, the most recent rules being related to public disclosure of financial remuneration of company officers.

Initially there were questions whether the Sarbanes-Oxley requirements applied to the publication of exploration results, mineral resources and mineral reserves. It is now generally accepted that these requirements apply to all information which has a material impact on financial reporting, including exploration results, mineral resources and mineral reserves. One section of SOX has had more of an impact on public reporting than any other: Section 404, “Management Assessment of Internal Controls”. This section specifies that the Commission of the SEC must prescribe rules requiring that, if a company is required to publish an annual report, this report contain an internal control report, which shall:

- (1) state the responsibility of management for establishing and maintaining an adequate internal control structure and procedures for financial reporting; and
- (2) contain an assessment, as of the end of the most recent fiscal year of the issuer, of the effectiveness of the internal control structure and procedures of the issuer for financial reporting.

In addition, with respect to the internal control assessment required above, each registered public accounting firm that prepares or issues the audit report for the issuer shall attest to, and report on, the assessment made by the management of the issuer.

Section 404 makes the company management responsible for establishing, maintaining and assessing the effectiveness of internal controls. In addition Section 404 makes the auditing accounting firm responsible for evaluation of the management’s statement concerning the effectiveness of these controls. Introduction of Section 404 has resulted in increasing attention being given by management and external auditors to controls and procedures put in place to estimate and report exploration results, mineral resources and mineral reserves. Most mining companies have developed documented procedures, with defined lines of responsibility. The effectiveness of the internal control structure and procedures is assessed by periodic internal and external audits. A committee of the Board of Directors is also responsible for reviewing company estimates of resources and reserves before they are publicly disclosed. In the opinion of the author of this paper, the

Section 404 requirement that management establishes, maintains, assess the effectiveness of, and be responsible for internal controls and procedures, has significantly improved industry practices and should result in enhanced disclosure.

THE SEC RULE-MAKING PROCESS

There are material differences between the SEC requirements for public reporting of exploration results, mineral resources and mineral reserves, and the corresponding requirements by non-US regulatory agencies. Reaching the objective of universal standards will require changes, including changes in the SEC rules and the staff interpretation of these rules. How such changes could occur requires understanding of the SEC rule making process. Some of the critical options available for rule making are summarized in Figure 3.

The rulemaking process usually begins with a rule proposal. The staff of the SEC drafts a detailed formal rule proposal and presents it to the full Commission. A rule proposal is specific in its objectives and methods for achieving its goals. Following approval by the Commission, the rule proposal is presented to the public for a specified period of time for review and comment. Input is considered as a final rule is crafted.

Sometimes an issue is so unique and/or complicated that the Commission seeks out public input on which, if any, regulatory approach is appropriate. A concept release is issued describing the area of interest and the Commission's concerns and usually identifying different approaches to addressing the problem, followed by a series of questions that seek the views of the public on the issue. The public's feedback is taken into consideration as the Commission decides which approach, if any, is appropriate.

Another process consists in a person requesting that the Commission issue, amend or repeal a rule of general application. Once again the public's feedback is taken into consideration as the Commission decides which approach, if any, is appropriate.

Various approaches were considered, which could be followed to achieve convergence of the SEC rules with those applicable outside the US. It was decided that a preferred approach would consist in submitting recommendations to the Division of Corporation Finance for their review and comments. It was felt that this approach would be most productive since ultimately any rule concerning the mining industry would have to be drafted and adopted by the Division of Corporation Finance.

Figure 3 – Overview of SEC Rule Making Process

Documents Published by the Commission of the SEC	
Concept Releases	The Commission occasionally publishes "concept" releases to solicit the public's views on securities issues and better evaluate the need for future rulemaking.
Rule Proposals	The Commission publishes "rule proposals" to solicit the public's views on securities issues before a final rule is issued
Final Rules	Final rules published by the Commission are legally binding
Interpretive Releases	The Commission occasionally provides guidance on topics of general interest to the business and investment communities by issuing "interpretive" releases, in which it publishes its views and interprets the federal securities laws and SEC regulations.
Policy Statements	From time to time, the Commission issues a "policy statement" to clarify its position on a particular matter.
Documents Published by the Staff of the SEC	
Staff Interpretations	Staff interpretations are written or oral statements made by members of the SEC's staff to provide guidance to those who must comply with the federal securities laws. However, because they represent the views of the staff, they are not legally binding.
Petitions Made to the SEC by the Public	
Petition for Rule Making Submitted to the SEC	Any person may request that the Commission issue, amend or repeal a rule of general application.

ISSUES FACED BY THE INTERNATIONAL MINING INDUSTRY

A number of significant issues are faced by international mining companies which publicly report exploration results, mineral resources and mineral reserves, when this reporting is subject to the rules and regulations of the US Securities and Exchange Commission. The reasons for these issues can be summarized as follows:

- The SEC requirements, as specified in Industry Guide 7, are not well defined, resulting in staff interpretations which vary over time.

- There are inconsistencies between SEC requirements for financial reporting (which must follow US GAAP) and for technical reporting (as defined in Industry Guide 7 and staff comments)
- There are inconsistencies between US reporting requirements (defined by Industry Guide 7) and reporting requirements applicable in other major financial markets (defined by the JORC code in Australia, NI 43-101 in Canada, and the SAMREC code in South Africa.)

As a leading US and international mining professional society, the Society for Mining, Metallurgy, and Exploration, Inc. (SME) recognized that it should play a key role in assisting the mining industry in defining and resolving these issues. To accomplish this objective, members of SME met with the SEC Division of Corporation Finance in 2003, and completed an informal survey of the mining industry. SME also organized a focus meeting in Reston, Virginia, USA, in 2004, attended by technical and financial representatives of the international mining industry, regulators from Australia, Canada and the US, and representatives of other sectors of the industry. Five specific issues were retained as needing particular attention:

- Commodity price: Which price assumptions should be made when estimating mineral reserves?
- Publication of mineral resources: Under which conditions should publication of mineral resources be allowed?
- Requirements for technical and economic study: What type of technical and financial study should be completed before a mineral reserve can be published?
- Permit and legal requirements: which legal requirements should be satisfied before a mineral reserve can be published?
- Role of Competent Person: should there be a requirement that resources and reserves estimated for the purpose of public disclosure under SEC rules are estimated under the supervision of a Competent Person?

FORMATION OF “SEC RESERVES WORKING GROUP”

Following the 2004 meeting in Reston, SME formed the “SEC Reserves Working Group” (the Working Group) whose mission was as follows:

- Develop an industry position with respect to the five issues listed above.
- Present the industry position to the SEC for comment.

SEC regulations have both technical and accounting components, and to ensure that the Working Group was representative of as wide a range of industry interests as possible, the Working Group was composed of mining companies, consulting companies and accounting firms. The companies whose representatives formed the Working Group are listed on Figure 4. Technical, accounting and management representatives all played an active role in the deliberations of the Working Group.

Figure 4 – Entities whose Representatives formed the Reserves Working Group

<p>Chair: Jean-Michel (J.M.) Rendu, Mining Consultant Richard P. Co-Chair: Graff, CPA, The Graff Consulting Group, LLC</p>	
<p>Mining Companies</p> <ul style="list-style-type: none"> • Anglo American Plc • AngloGold Ashanti • Arch Coal • Barrick Gold Corporation • BHP Billiton • Freeport-McMoran Copper & Gold Inc • INCO • Kinross Gold Corporation • Newmont Mining Corporation • Peabody Energy • Phelps Dodge Mining Company • Placer Dome Inc • Rio Tinto Plc 	<p>Accounting Firm:</p> <ul style="list-style-type: none"> • PricewaterhouseCoopers LLP <p>Consulting Firms</p> <ul style="list-style-type: none"> • AMEC Inc, Mining & Metals Consulting • Behre Dolbear & Company, Inc. • Independent Mining Consultants • John T. Boyd Company • Pincock, Allen, & Holt

A coal review group was assembled to ensure that coal-specific issues were taken into consideration. The Working Group recommendations were also submitted for review to mining and consulting companies; members of accounting firms, investment banks, and various national and international committees and organizations; to financial analysts; and to university professors.

The Working Group recommendations were submitted to the staff of the SEC Division of Corporation Finance for their review and comments on April 30, 2005.

RECOMMENDATIONS SUBMITTED TO THE SEC

The recommendations submitted by the Working Group to the staff of the SEC can be summarized as follows:

Commodity Pricing

Currently the staff of the SEC requires that, whenever applicable, the commodity price used for reserve estimation is the average price of the last three years. This interpretation of Industry Guide 7 is considered applicable to commodities whose price is listed on open markets, such as precious and base metals. For other commodities such as iron ore, coal, and industrial minerals, forward looking prices may be applicable provided they are supported by available information such as sales contracts. The SEC staff also strongly recommends that commodity prices be publicly disclosed.

Other regulatory agencies, such as those of Canada, Australia and South Africa accept management's reasonable and supportable price forecasts. Disclosure of commodity prices is preferred but not required.

The SEC staff requirements for reserve estimation differ from financial requirements as specified by US GAAP (Generally Accepted Accounting Principles). According to US GAAP, SEC Reserves must be used for depreciation, depletion, and amortization and management's long term outlook must be used for purchase price allocation and impairment testing. The commodity price to be used for accounting purposes is management's reasonable and supportable price forecast, not the last-three year average price.

The Working Group's opinion was that, to best inform the public, the prices used for reserve estimation should be consistent with the assumptions made by management for internal planning and required to be made for financial reporting. However the Working Group also recognized that the use of a single commodity price (such as a three-year average) makes comparison between companies easier. Depending on circumstances this prescriptive approach can also prevent the use of excessively optimistic forward-looking price assumptions². For these reasons the Working Group made the following recommendations:

- Management's reasonable and supportable forward looking price estimates should be used for reserve estimation.
- Justification of the prices used should be fully documented. This document should be available to the SEC on request. This requirement would reduce the risk that arbitrarily high commodity prices are used.

² A concern of the Working Group was that when prices are rapidly decreasing after reaching the top of a cycle, the three-year trailing price average may in fact be overly optimistic.

- Public disclosure of the prices used should be recommended but not required.
- If historical prices are available, a “reserve sensitivity test” should be performed based on a “test price” equal to the three year historical price average. The test results and the test price should be publicly disclosed. This requirement would facilitate comparison between mining companies.

Publication of Mineral Resources

Industry Guide 7 specifies that a company must not disclose estimates other than proved or probable reserves unless:

- (1) such information is required to be disclosed by foreign or state law; or
- (2) such information was previously provided to a person that is offering to acquire, merge or consolidate with the company.

In practice the staff of the SEC has allowed publication of estimates other than proved or probable reserves, subject to the following conditions:

- The term “resource” must not be used, because of its similarity with the term “reserve”. Terms such as “other mineralized material” can be used.
- Only tons and grades or quality can be published. The quantity of potentially valuable commodity contained in the resource (such as metal content) must not be published.

Other regulatory agencies, such as those of Canada, Australia and South Africa, accept publication of mineral resources provided they are categorized as measured, indicated or inferred, and provided inferred resources are listed separately from the other categories of resources. From an accounting point of view, US GAAP recognizes that material other than reserves has value, which value is defined as “Value Beyond Proven and Probable Reserves” (VBPP). VBPP must be taken into account in purchase price allocation and asset impairment.

The Working Group’s opinion was that, because mineral resources have value which is recognized by US GAAP, by other international regulators, and by the investing public, companies should be allowed to publish this information. Under current regulations there can be inconsistencies between material information voluntarily disclosed to the public in foreign markets and that readily available to US investors. However the Working Group also recognized that, because the definitions of mineral resources are by necessity not as prescriptive as those of mineral reserves, publication of mineral resources could be misleading and stricter definitions should be developed. For these reasons the Working Group made the following recommendations:

- Companies subject to SEC rules and regulations should be allowed to publicly disclose mineral resources.
- Before being disclosed, resources should be classified as measured, indicated, or inferred. Modifications to the definition of these three classes are recommended to make them less subjective. Classification should take into account the precision with which the resource is estimated as well as the size of this resource in relation to the mining method likely to be used.
- As defined, mineral resources represent material which has “reasonable prospects for eventual economic extraction”. The assumptions made and method used to demonstrate such reasonableness should be documented and such documentation should be available to the SEC on request. This requirement would significantly reduce the risk that misleading information is publicly released.

Technical and Economic Study Requirements

As specified in Industry Guide 7, a reserve is defined as that part of a mineral deposit which could be economically and legally extracted or produced at the time of the reserve determination. The term “economically” is not defined, but the staff of the SEC has stated that a feasibility study should be completed for new projects, and that revised mine plans and cash flows should be prepared for addition of reserves to existing properties.

Other regulatory agencies, such as those of Australia, Canada and South Africa, do not specify what type of technical and economic studies should be completed. Whether the necessary studies have been completed must be determined by the Competent Person or Qualified Person responsible for estimation and reporting of the reserve. In Canada, NI43-101 allows the use of either a preliminary feasibility study (pre-feasibility study) or a full feasibility study to define a reserve. NI43-101 also specifies that a Technical Report must be submitted, whose content is specified. The JORC code states that the term “economically mineable” implies that extraction of the mineral reserve has been demonstrated to be viable under reasonable financial assumptions and that appropriate studies must have been completed accordingly, but that it may not be necessary for these studies to be at the level of a final feasibility study. Conversely the staff of the SEC has specifically stated that pre-feasibility studies are not acceptable as proof that a reserve can be declared.

The Working Group recommendations can be summarized as follows:

- A mineral reserve should be defined as the economically mineable part of a measured or indicated mineral resource. This definition is consistent with that adopted outside the US but requires recognition by the SEC of the terms measured and indicated mineral resource.
- The type of study which should be completed before a mineral reserve is publicly disclosed should be determined by a Competent Person. This recommendation

would require that the SEC accepts the definition of a “Competent Person” and the requirement that a Competent Person be responsible for reserve estimation and disclosure.

- A “Mineral Reserves Declaration Report” should be completed under the responsibility of the Competent Person. The content of this Mineral Reserves Declaration Report should be determined by the Competent Person. A check list should be given for guidance. The report should be available for review by the staff of the SEC on request.

Permitting and Legal Requirements

As stated in Industry Guide 7, for a reserve to be published it must be demonstrated that it can be legally extracted or produced when determined. There must be reasonable expectation that all permits, ancillary rights and authorizations required can be obtained in a timely fashion. This SEC requirement is not materially different from that applicable in other non-US regulatory environments.

The Working Group recommendations do not represent a change in permitting and legal requirements, but rather a clarification of what these requirements are. The recommendations can be summarized as follows:

- The reporting entity must have a legally enforceable mineral title sufficient to allow exploration, development and extraction of the mineral reserve.
- There must be reasonable expectation that all permits, ancillary rights and authorizations required for mining and processing can be obtained in a timely fashion.

Competent Person

According to Industry Guide 7 the name of the person preparing reports in support of a published reserve must be included in the report. There is no specification of the qualification that such a person should have. Conversely the Australian, Canadian and South African regulators specify that reserves must be estimated by a Competent or Qualified Person. The minimum conditions that a person must satisfy to be recognized as a Competent or Qualified Person are also specified by the regulators and vary only slightly from one regulatory environment to another.

In the US, financial auditors are required to follow guidelines of the Generally Accepted Auditing Standards (GAAS). These guidelines recognize that Specialists (such as geologists) may be used by independent auditors in the audit of financial statements prepared in conformity with US GAAP.

The Working Group recommended that mineral resources and mineral reserves should be estimated by a Competent Person defined as:

- a geologist, engineer, geoscientist, or other mining professional;
- who is a member of an approved professional organization which admits its members primarily on the basis of education and experience, and which has a code of ethics which it is willing and able to enforce; and
- who has at least five years relevant experience.

When these recommendations were drafted by the Working Group, there were few professional institutions in the US which had an enforceable code of ethics and which could be joined by those commonly responsible for estimation and reporting of mineral resources and mineral reserves. SME recognized this as a major shortcoming and concluded that a new class of SME members should be formed which could be recognized, not only in the US but also by Canadian, Australian and South African regulators, as an approved professional organization.

REGISTERED MEMBERS OF THE SOCIETY FOR MINING, METALLURGY, AND EXPLORATION, INC.

In 2005, mostly as a result of the recommendations made by the Working Group that resources and reserves be estimated by a Competent Person, the Board of Directors of the Society for Mining, Metallurgy, and Exploration, Inc. (SME) voted for the formation of a new class of members to be known as Registered Members.

A Registered Member is a scientist, engineer or technologist who is concerned in various ways with the discovery, extraction and utilization of minerals, metals and energy sources. The membership includes geologists and other geoscientists, mining engineers and metallurgists, environmentalists, other engineers and other scientists and technologists. A person eligible for admission in the class of Registered Member must:

- (1) have a university degree from a US accredited university or a recognized overseas university; and
- (2) have a minimum of five years of professional experience, of which at least three must have been in a position of responsibility, defined as one in which the individual was depended on for significant participation and decision making.

University degrees must be in fields related in various ways with the discovery, extraction and utilization of minerals, metals and energy sources. Professional experience must be in the mineral and extractive industries, or in government, educational, research, professional or commercial organizations concerned with those industries. Every Registered Member shall observe and be bound by the SME Code of Ethics as published by SME from time to time. Any alleged breach of this code or any alleged unprofessional

conduct by a Registered Member which may be brought before the SME ethics committee shall be investigated and, if proved, shall be dealt with in accordance with SME defined procedures.

The class of Registered Members was designed not only to satisfy the recommendation made to the SEC that reserves be estimated by a Competent Person member of an approved professional organization, but also for recognition by regulators outside the US. In Australia a person preparing and reporting exploration results, mineral resources and mineral reserves must be a member of an Australasian professional organization recognized by the Australian Stock Exchange (ASX), or of a Recognized Overseas Professional Organization (ROPO) which must also be recognized by the ASX. Similarly in South Africa the person must be a member of a South African professional organization recognized by the Johannesburg Stock Exchange (JSE), or a ROPO also recognized by the JSE. In Canada the person must be a member of a Canadian professional organization or a foreign “professional association” as defined in National Instrument 43-101 and included in a list updated periodically by Canadian regulators.

In January 2006, SME applied for recognition by Australian, Canadian, and South African regulators. The SME class of Registered Members was recognized as a ROPO by the JORC committee and the ASX in March 2006. At the time this paper was written the South African and Canadian regulators were in the process of reviewing the SME application for recognition.

The SME started accepting Registered Members on January 1, 2006 and more than 250 applications were received during the first three months of the year.

CONCLUSION: WHERE ARE WE AND WHERE DO WE GO NEXT?

The similarity of recent codes and guidelines is illustrated in Figure 5³. Considerable progress has been made towards standardizing international requirements for estimation and reporting of exploration results, mineral resources and mineral reserves. However much more needs to be done, primarily in the US but also with a number of international bodies. The SEC Reserves Working Group submitted its recommendations to the SEC on 30 April 2005. The staff of the SEC has expressed interest in these recommendations but no official response was received from the SEC for a number of reasons:

- As required by Sarbanes-Oxley the SEC has an obligation to review all companies listed on the US stock exchanges every three years. The first three year period ended September 2005.

³ Figure 5 was reproduced from the following article after modifications: Stephenson, P.R., International Resource/Reserve Reporting Standards, in “Digging Deeper”, AMC Consultants Pty Ltd, Melbourne, Australia, September 2005, pp 2 & 3.

Figure 5 – Comparison of Codes and Guidelines

	Australasia	Canada	South Africa	UK / Western Europe	Chile	USA - SME	USA - SEC	USA – GAAP / GAAS
CRIRSCO-type standards have been adopted	Yes	Yes	Yes	Yes	Yes	Yes	No	N/A
Reporting standards recognized by National Regulators	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Competent Person requirement	Yes	Yes	Yes	Yes	Yes	Yes	No	(1)
Reporting of mineral resources allowed	Yes	Yes	Yes	Yes	Yes	Yes	No	N/A
Inferred resources allowed in economic studies	(2)	(3)	(2)	(2)	(2)	(2)	No	Yes
Level of study required to declare a Mineral Reserve	(4)	(5)	(4)	(5)	(5)	(4)	(6)	N/A
Commodity price process specified by National Regulators	No	No	No	No	No	No	Yes	No

USA-SME: USA Society for Mining, Metallurgy, and Exploration, Inc.

USA-SEC: USA Securities and Exchange Commission

USA-GAAP/GAAS: USA Generally Accepted Accounting Principles / Generally Accepted Auditing Standards.

- (1) US auditors expect that reserves are estimated according to SEC rules and satisfy Sarbanes Oxley requirements for processes and controls.
 - (2) Competent Person decides to which extent Inferred Resources can be used if at all. Because of the risk involved, caution should be exercised if this category is considered in technical and economic studies.
 - (3) Allowed in certain restricted circumstances.
 - (4) Appropriate assessment and studies are required as determined by Competent Person.
 - (5) Pre-feasibility is required in Canada and Chile and expected in the UK and Western Europe.
 - (6) Feasibility study is required for new projects. Mine plan and cash-flow analysis are required for additions to existing projects. Requirements vary with commodity being mined.
- N/A: Not applicable. No stated position with respect to this item.

- Another Sarbanes-Oxley requirement is that the SEC develops new rules for public reporting and internal controls which apply to all public companies, not only the mining industry.
- Priorities for rule making are given to issues related to all public companies, or to companies which represent large sectors of the financial market. The mining industry is a small sector, and related issues are not given high priority.

In an effort to continue the forward movement towards standardization, the SME recently decided to contact the Director of the Division of Corporation Finance, to inquire whether review of the Working Group recommendations could be given higher priority. A possible path forward would consist in the SEC issuing Concept Releases to update Industry Guide 7. At the time this paper was written it was too early to know how the SEC would respond to this inquiry.

On an international basis CRIRSCO has become the partner of choice to discuss public reporting issues that are of direct relevance to mining companies. International organizations with which CRIRSCO is discussing such reporting issues include:

- The United Nations (UN ECE), where CRIRSCO is working to ensure recognized, industry-friendly reporting standards which would be accepted in new areas of strong business development such as Russia, China and India.
- The International Accounting Standards Board (IASB), where the development of new International Financial Reporting Standards could bring in the need for much more extensive reserve disclosure.
- The Society of Petroleum Engineers (SPE), with which CRIRSCO is working at the request of the IASB to examine potential convergence of resource and reserve definitions with the risk that, without strong representation, mining companies could have oil industry reporting standards imposed on them.
- The SEC, where CRIRSCO is directly and indirectly supporting the Working Group efforts to remove the many inconsistencies between reporting in the US and elsewhere.
- The International Council of Mining and Metals (ICMM) with which CRIRSCO is discussing possible alliance to obtain stronger mining industry recognition and participation.

Because of the variety of countries and public and private entities concerned with estimation and reporting of mineral resources, a question will always remain: Is it possible to reach international agreement and, more importantly, is a goal of international homogeneity a desirable goal? Answering this question is required to define the long-term role of CRIRSCO. It is this author's opinion, which is arguably widely shared, that:

- General guidelines should be developed that are accepted and followed by all, to ensure that publicly disclosed mineral resources and mineral reserves can be understood and interpreted appropriately by the public for which disclosures are made. Changes in these general guidelines would require consensus agreement.
- Within this general framework, country specific codes and guidelines will continue to be developed. Differences between countries will persist depending on the significance of the mining sector, the legal environment, the changing

expectations of the regulators and the financial market. Such differences are not only necessary but indeed critical to ensure a progressive rule-making process. Each country will learn from progress made elsewhere, and will modify its own rules taking into account global experience, the result being continuous improvement of worldwide reporting practices.

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