SME GUIDE FOR REPORTING EXPLORATION INFORMATION, MINERAL RESOURCES, AND MINERAL RESERVES

(The SME Guide)

PREPARED BY:

THE RESOURCES AND RESERVES COMMITTEE
OF
THE SOCIETY FOR MINING, METALLURGY, AND EXPLORATION, INC.

AND APPROVED BY:

THE BOARD OF DIRECTORS
OF
THE SOCIETY FOR MINING, METALLURGY AND EXPLORATION, INC.

12999 East Adams Aircraft Circle
Englewood, CO 80112
www.smenet.org
303 948 4200

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Foreword

i. This *SME Guide for Reporting Exploration Information, Mineral Resources, and Mineral Reserves* (the SME Guide) has been adopted by the Society for Mining, Metallurgy, and Exploration, Inc. (SME) for use by members of this organization and others. A history of the Guide is provided in Appendix H.

ii. The SME Guide is recommended as a minimum standard for any individual, sole proprietorship, partnership, limited liability company, corporation, or other legal entity (Company) reporting Exploration Information and estimates of Mineral Resources and Mineral Reserves to outside parties for public or private purposes.

iii. In the SME Guide, the definitions of some important terms are highlighted in **bold** text. The guidelines are written using regular font. Paragraphs with a border on the left side and written in *italics* give directions on how to interpret definitions and guidelines. The definitions and other terms used in the SME Guide are listed in the Glossary (Appendix B).

iv. The U.S. Securities and Exchange Commission (SEC) regulates the reporting of Exploration Information, Mineral Resources, and Mineral Reserves by companies subject to the filing and disclosure requirements of the U.S. SEC as promulgated in its Regulation S-K, Industry Guide 7, and staff communications. Decisions as to whether information should be filed with the SEC or reported publicly are the sole responsibility of the person or Company making the filing or public disclosures, and the contents of such filings and public disclosures are prescribed by SEC rules, regulations, and interpretations, including but not limited to Industry Guide 7 and other staff communications. The reporting of Exploration Information, Mineral Resources, and Mineral Reserves may also be subject to other national and international rules and regulations. These rules and regulations vary from time to time, and at any given time may not be consistent with the guidance given by the SME Guide. The advice of securities counsel should be sought in preparing filings for the SEC or other securities regulatory authorities, and in preparing other public disclosures.

v. It is recognized that further review of the SME Guide will be required from time to time to remain consistent with internationally recognized standards. Constructive suggestions are solicited from all users of the SME Guide. Comments should be sent to:

Chairperson, Resources and Reserves Committee
Society for Mining, Metallurgy and Exploration, Inc.
12999 East Adams Aircraft Circle
Englewood, CO 80112
www.smenet.org
303 948 4200

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Governing Principles

1. The SME Guide seeks to ensure transparency, materiality, and competence in reports on Exploration Information, Mineral Resources, or Mineral Reserves prepared by or for the Company holding a Mineral Deposit(s) to inform outside parties, such as investors or potential investors and their advisers, or to satisfy regulatory requirements (referred to herein as Public Reports, whether used for public or private purposes).

- ***Transparency*** requires that the reader of a Public Report is provided with sufficient information, the presentation of which is clear and unambiguous, so as to understand the Public Report and not to be misled.
- ***Materiality*** requires that a Public Report contain all the relevant information for the purpose of making a reasoned and balanced judgment regarding the Exploration Information, Mineral Resources, or Mineral Reserves being reported.
- ***Competence*** requires that the Public Report be based on work that is the responsibility of suitably qualified and experienced mining industry professional(s) termed *Competent Person(s)* who are either Registered Members of SME or eligible members of another Recognized Professional Organization (RPO) subject to an enforceable professional code of ethics and rules of conduct (see Competence and Responsibility, Clause 9, below).

> *In order to ensure Transparency, one or more Competent Persons should provide explanatory commentary on the material assumptions underlying the presentation of Exploration Information, Mineral Resources, or Mineral Reserves.*
>
> *A Competent Person[1] should consider the benchmark of Materiality to be the inclusion of all aspects relating to the Exploration Information, Mineral Resources, or Mineral Reserves on which the audience of a Public Report would reasonably expect to be provided explicit comments from the Competent Person. A Competent Person should discuss any material aspect for which the presence or absence of comment could affect the public perception of the mineral occurrence. Any Public Report should indicate that Mineral Resources and Mineral Reserves are always estimates with attendant uncertainties.*
>
> *A Competent Person should provide a balanced discussion of risks and opportunities accompanying statements of Mineral Resources and Mineral Reserves.*
>
> *A Public Report should be supported adequately by text, figures, tables, sections, and maps to demonstrate competence by conveying material information in a transparent manner. Figures of any type should contain appropriate explanatory information in the form of titles and/or captions, and legends.*

[1] CRIRSCO is the Committee for Mineral Reserves International Reporting Standards (See Appendix G). Various CRIRSCO members use different terms for the Competent Person; e.g., Canada (Qualified Person) and Chile (Qualified Competent Person). These alternative terms are considered to be directly equivalent to Competent Person. As used herein a Competent Person can be singular or plural.

2. Additional principles should also be considered by Competent Persons when preparing Public Reports:

- ***Consistency between Financial Reports and Technical Studies***: Financial statements and reports may take into account Pubic Reports on Mineral Resources and Mineral Reserves and may include assumptions concerning commodity prices, exchange rates, and other parameters of significance. To be clear and unambiguous, financial information should be based on the same assumptions as those made in the corresponding Public Reports.
- ***Consistency between International Markets***: For global entities, transparency requires information in Public Reports and accompanying financial statements to be reported on a consistent basis in all financial and securities markets. Only then can the information supplied be comparable, clear, and unambiguous.

3. The SME Guide does not constitute legal advice or guidance. Users of the SME Guide are cautioned to obtain legal advice as to the disclosure requirements of U.S. state and federal securities laws and corresponding foreign laws when offering, selling, or purchasing securities or other investment interests in mining properties. SME disclaims responsibility for the adequacy of disclosures made in accordance with the SME Guide under these or any other laws and any liabilities arising therefrom. This being said, the guidance provided has been developed and refined over many years and is recommended practice. The verb "should" has often been used rather than "shall" or "must," which would normally be used in a law or in a legally-binding standard.

Scope

4. Public and Private Reporting: The SME Guide is recommended as a minimum standard for reporting Exploration Information, Mineral Resources and Mineral Reserves for Public Reports by both publicly held and privately held Companies holding Mineral Deposits. A Mineral Deposit (including coal, diamonds, industrial minerals, and mineral products obtained through in situ recovery methods) is defined herein as an accumulation of mineral(s) of potential economic interest within estimated geological boundaries.

5. Use of the SME Guide: Public Reports should provide relevant and material information concerning a Mineral Deposit that could influence its economic value, which is necessary to make a reasoned and balanced assessment of the Exploration Information, Mineral Resources, and Mineral Reserves and attendant risks and opportunities being reported. Public Reports refers to reports provided to parties outside the Company, such as current or potential investors and their advisors, regulators, and others (see Public Reporting—General below).

> *While every effort has been made within the SME Guide to cover the situations likely to be encountered in the reporting of Exploration Information, Mineral Resources, and Mineral Reserves, inevitably there will be situations when doubt exists as to the appropriate procedure to follow. In such cases, those compiling or reviewing reports under the SME Guide should refer to its intent to ensure that such reporting contains all necessary information for the purpose of making a reasoned and balanced judgment regarding the Exploration Information, Mineral Resources, and Mineral Reserves reported. In this*

connection, the governing principle of transparency requires that the decision process of the Competent Person be explained whenever the SME Guide is not explicit as to the appropriate procedure to follow.

Table 1, included in the SME Guide, supplies a checklist of items that should be considered when evaluating a project. The relative importance of the items in Table 1 of the SME Guide will vary with each project depending on the geological environment and technical constraints, as well as economic, marketing, legal, environmental, infrastructure, social, and governmental considerations pertaining at the time of evaluation. When evaluating a project, the relative importance of each item should be weighed. All relevant information should be given careful consideration before deciding which information should be reported to the public. Table 1 of the SME Guide should be considered a guide to facilitate a rational and orderly approach to evaluation; as always, transparency and materiality are the overriding principles that guide the determination as to which information should be included in a Public Report.

The SME Guide does not alleviate the need for exploration and mining professionals to make difficult decisions, such as whether to classify material as a Mineral Resource, or how to further classify Mineral Resources (as Inferred, Indicated, or Measured), or Mineral Reserves (as Probable or Proven). Decisions remain a matter of professional judgment based on knowledge, experience, and industry practices, generally referring to the criteria set forth in Table 1 of the SME Guide.

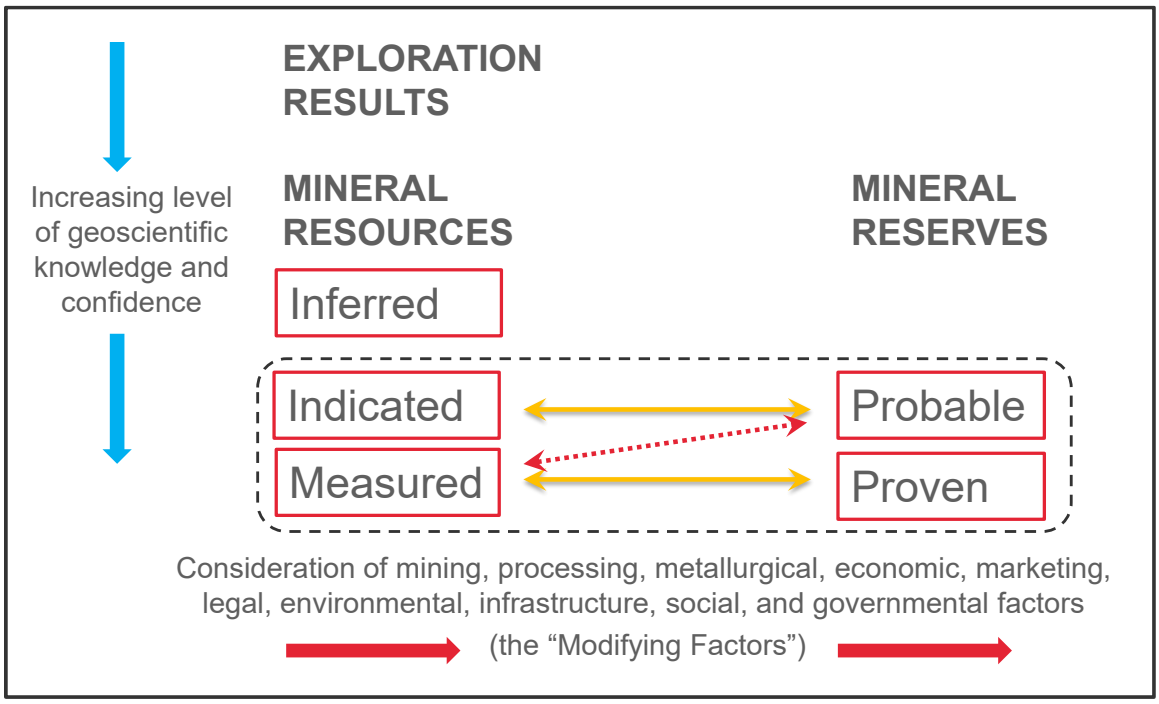
Table 2, included in the SME Guide, provides a range of expected accuracies for capital and operating cost estimates relative to the three study levels outlined in the SME Guide, namely Scoping Studies, Pre-Feasibility Studies, and Feasibility Studies. Scoping Studies are mining studies at a conceptual level, and may be used to identify options for project development and to define and support future work programs to enable conversion of Mineral Resources to Mineral Reserves, whereas the more comprehensive Pre-Feasibility and Feasibility Studies should be used to support declaration of Mineral Reserves.

Estimates of Exploration Information and related interpretations, as well as estimates of Mineral Resources and Mineral Reserves (being predictions of reality based on imperfect and incomplete information available at the time of estimation) are inherently forward-looking statements that will always be inaccurate to some degree. Different individuals analyzing the same data may arrive at somewhat differing interpretations and conclusions. Nevertheless, all Public Reports concerning Exploration Information, Mineral Resources, and Mineral Reserves should have a reasonable basis and be made in good faith.

If at some later date a Mineral Resource or Mineral Reserve estimate is reclassified or proven inaccurate because additional information becomes available or economic conditions have changed, the original estimate was not unreasonable or made in bad faith so long as the Competent Person for the original estimate provided a transparent report that took into account all material information available to the Competent Peron at the time the estimate was made.

6. Relationship between definitions: Figure 1 of the SME Guide sets out the framework for classifying Exploration Information, Mineral Resources, and Mineral Reserves.

Figure 1. General Relationship between Exploration Information, Mineral Resources and Mineral Reserves



The relationships in Figure 1 of the SME Guide reflect different levels of geoscientific knowledge and different degrees of technical and economic evaluation. Mineral Resources can be estimated on the basis of geoscientific information with input from other disciplines to establish reasonable prospects for eventual economic extraction. Mineral Reserves, which are a modified sub-set of the Indicated and Measured Mineral Resources, require consideration of those factors affecting extraction, including mining, processing metallurgical, economic, marketing, legal, environmental, infrastructure, social, and governmental factors (the Modifying Factors, see Clause 7 below), and should in most cases be estimated with input from a range of disciplines.

In certain situations, Measured Mineral Resources could convert to Probable Mineral Reserves rather than to Proven 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 dotted arrow in Figure 1. In such situations, these Modifying Factors should be fully explained.

In certain situations, previously reported Mineral Reserves could convert back to Mineral Resources because of new Modifying Factor 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. The Modifying Factors that resulted in reclassification of a Mineral Reserve should be fully explained.

In some operating mines, additional geological sampling may be the only information needed to support an upgrade from an Inferred Mineral Resource to an Indicated or Measured Mineral Resource. Because the Modifying Factors required to convert Indicated or Measured Resources to Proven or Probable Reserves may have been established for an operating mine, the added geoscientific information can allow immediate reclassification of such incremental Indicated or Measured Resources to Proven or Probable Reserves.

7. **Modifying Factors are considerations used to convert Measured and Indicated Mineral Resources to Proven and Probable Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, economic, marketing, legal, environmental, infrastructure, social, and governmental factors.**

Mineral Resources are supported by Modifying Factors based on benchmarks and/or the opinion and experience of the Competent Person. For Mineral Reserves, Modifying Factors are defined and applied by studies completed at Pre-Feasibility Study or Feasibility Study level.

Competence and Responsibility

8. Any Public Report concerning the Company's Exploration Information, Mineral Resources, and Mineral Reserves of a Company is the responsibility of the Company's management. Any such report, usually only for properties of material value to the Company, should be based on, and fairly reflect the information and supporting documentation prepared by a Competent Person, as defined in Clause 9. For purposes of the SME Guide, "Company" refers to an individual, sole proprietorship, partnership, limited liability company, corporation, or other Company holding an ownership interest in the Mineral Deposit that is the subject of the Public Report.

A Company issuing a Public Report shall make available the name(s) of the Competent Person, all material relationships between the Competent Person and the Company and a statement as to whether the Competent Person is independent of the Company.

When issuing a Public Report, the Company should ensure that a Competent Person has reviewed and provided written consent to the form and context of the information prior to release of the report. Reasonable time should be allowed for the Competent Person to review these materials prior to approval. Consents of Competent Persons should be limited to work performed by the Competent Person or work for which the Competent Person has accepted responsibility. An Example Consent of the Competent Person is provided in Appendix C. Where the Public Report is in the form of a Summary Technical Report or supporting documentation with reference to Table 1 of the SME Guide (see Appendix D), the Competent Person should also provide a certificate disclosing the Competent Person's relationship to the Company, any site visits made, relevant experience to support the Competent Person's work, and the Competent Person's qualifications, including membership at a specified level in a Recognized Professional Organization (RPO). A sample form of such a disclosure certificate is provided in Appendix E.

The foregoing requirements are aimed at ensuring that the Company obtains the higher quality of information intended by the requirement to engage a Competent Person.

9. **A Competent Person is a minerals industry professional who is a Registered Member of SME or a designated member of an approved "Recognized Professional Organization" (RPO) included in a list promulgated by SME from time to time (Appendix A). A requirement for a professional organization to be recognized as an RPO is that it has enforceable disciplinary processes including the powers to suspend or expel a member. A Competent Person should have a minimum of five years relevant experience in the style of mineralization and type of deposit under consideration and in the activity which that person is undertaking.**

The RPO must have jurisdiction over the Competent Person's actions regardless of where the Competent Person resides, where the Mineral Deposit is located or where the Public Report is issued, and in all cases the Competent Person must be subject to the code of ethics of the RPO. Further, the Competent Person should be licensed or registered in any jurisdiction in which such registration is required by law.

A Competent Person may be an employee of the Company or may be an independent third party. In the SME Guide, the term "Company" is understood to refer to the reporting entity that is issuing the Public Report, and "firm" refers to a third party such as a consulting firm, or engineering company, etc. A partnership, limited liability company, firm, or other legal entity that includes one or more Competent Persons may also be considered a Competent Person if and to the extent that such individual Competent Persons participate in the preparation and review of the Public Report.

If the Competent Person is preparing a report on Exploration Information, the relevant experience should be in exploration. If the Competent Person is estimating, or supervising the estimation of Mineral Resources, the relevant experience should 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 should be in the estimation, assessment, and economic evaluation of Mineral Reserves.

The key qualifier in the definition of a Competent Person is the word "relevant," Determination of what constitutes relevant experience can be difficult, and common sense should be exercised. While it is clear that different experience is required to evaluate coal, base metal, industrial mineral, iron ore, sand and gravel, or gold deposits, other differences are less obvious. 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 a low grade disseminated gold deposit may not be relevant. Similarly, to qualify as a Competent Person in the estimation of Mineral Reserves for alluvial gold deposits, considerable (at least five years) experience in the evaluation and economic extraction of this type of mineralization would be needed. This is due to the characteristics of gold in alluvial systems, the particle sizing of the host sediment, and the low grades involved. Experience with placer deposits containing minerals other than gold may not necessarily provide appropriate relevant experience.

However, the requirement of "relevant" experience does not mean a person should 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 20 years' experience in estimating Mineral Resources for a variety of metalliferous hard-rock deposit types may not require as much as 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 experience in relation to porphyry-copper deposits.

In addition to experience in the style of mineralization, a Competent Person taking responsibility for the compilation of Exploration Information or Mineral Resource estimates should have sufficient experience in the sampling and analytical techniques relevant to the deposit under consideration to be aware of problems which could affect the reliability of data. Some appreciation of extraction and processing techniques applicable to that deposit type may also be required.

When applying the Modifying Factors to convert Mineral Resources to Mineral Reserves, the Competent Person should have sufficient knowledge and experience in the application of these factors to the Mineral Deposit. Collaboration of Competent Persons with geology, geostatistics, mining, and extraction/processing experience that is applicable to that deposit type is required.

10. Competent Persons should be 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 decline to act as a Competent Person.

Both reports and documentation should be well organized and archived such that competence is clearly demonstrated, and any forthcoming reviews (e.g., internal or external audits) can be conducted efficiently.

Estimation of Mineral Resources should be a team effort (for example, involving one person or team collecting the data and another person or team preparing the estimate). Estimation of Mineral Reserves is always a team effort involving several disciplines. Where there is a clear division of responsibility within a team, each Competent Person and their contribution should be identified, and responsibility accepted for that particular contribution. However, the definitions have been specifically written to allow an appropriate degree of latitude for Companies to define the organizational structure within which they apply the role of the Competent Person. 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 under the SME Guide. 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, in the Competent Person's professional opinion, that the work of the other contributors is reliable. However, the Competent Person who prepares or supervises the preparation of all or part of a report may include a limited disclaimer of responsibility if the Competent Person is relying on a report, opinion or statement of another specialist who is not a Competent Person, or on information provided by the Company, concerning marketing, legal, political, environmental, or tax matters relevant to the report.

A Competent Person may be an employee of the Company reporting Exploration Information, Mineral Resources, and Mineral Reserves, or an independent consultant. When the Competent Person's findings and recommendations are likely to have material consequences (such as development of a new mining or processing facility, or significant decreases or increases in Mineral Resources, and/or Mineral Reserves), it is important that these findings and recommendations be peer reviewed before the recommendations are finalized. The peer reviewer(s) should qualify as a Competent Person(s) in the context of the project being reviewed.

11. A Company's management is responsible for having a Competent Person review documents supporting Mineral Resource and Mineral Reserve estimates on at least an annual basis. Public Reports should be updated by a Competent Person if there are material changes in Mineral Resources, Mineral Reserves, or other scientific, technical, or economic parameters.

If there are material changes in, or reclassification of, Mineral Resources and Mineral Reserves, timely disclosure is required. In operating mines, reconciliation reports, which compare depleted Mineral Resources and Mineral Reserves with actual production, should be reviewed at least annually.

12. Complaints made in respect of the professional work of a Competent Person (or the individual Competent Persons acting for the Competent Person Firm) should follow procedures of the RPO to which the Competent Person belongs, such that when required they can be investigated and dealt with under the disciplinary procedures of that organization.

13. When estimates of foreign Exploration Information, Mineral Resources, and Mineral Reserves, are prepared by a person who is not a Registered Member of the SME or someone having the appropriate membership designation in a RPO as listed in Appendix A, the Company should nominate a Competent Person to take responsibility for the Exploration Information, Mineral Resources, or Mineral Reserves estimate. The Competent Person undertaking this activity should appreciate that they are accepting full responsibility for the estimate and supporting documentation and should not treat the procedure merely as a "rubber-stamping" exercise.

Rules, regulations, or guidelines concerning the Competent Person and public reporting differ from country to country. When Exploration Information, Mineral Resources, and Mineral Reserves are reported, it is the responsibility of the Competent Person and the Company making a Public Report to ensure that the applicable local disclosure rules, regulations, and guidelines are followed.

14. Supporting documentation detailing Exploration Information, Mineral Resources, and Mineral Reserves estimates, on which a Public Report on Exploration Information, Mineral Resources, and Mineral Reserves is based, should be prepared by, or under the direction of, a Competent Person.

Any individual who is named as the Competent Person for a Public Report accepts overall responsibility for the document and should be satisfied, in the Competent Person's professional opinion, that the work of all other contributors is reliable. If a partnership, limited liability company, or other legal entity is named the Competent Person for a Public

Report (a Competent Person Firm), a partner, officer, manager, employee, or director of the Competent Person Firm must be a Competent Person and should be satisfied in that Competent Person's professional opinion that the work of any other contributors is reliable.

As stated in Clause 8 above, issuance of a Public Report should be based on documentation prepared or reviewed by a Competent Person, and issuance requires the written consent of a Competent Person. If the documentation used to prepare the Public Report was signed by a Competent Person Firm, the signatory for the Competent Person Firm assumes the responsibilities of the Competent Person for the Public Report and should meet the criteria described in Clause 9 above.

15. If documentation used to prepare a Public report was originally signed by a partner, officer, director, employee, or manager of a Competent Person Firm, who is no longer associated with the Competent Person Firm, another partner, officer, employee, director, or manager should accept responsibility for the documentation as the signatory. The new signatory for the Competent Person Firm should satisfy the Competent Person criteria set out in Clauses 8–14 above. Before accepting such responsibility, the new signatory should complete sufficient work to be satisfied, in the signatory's professional opinion, that the content of the documentation remains reliable.

16. A Competent Person should have visited the property that is the subject of the Public Report within at most the past 18 months if accessible and/or have visited sample preparation facilities, analytical laboratories, and metallurgical testing laboratories as appropriate, before initial disclosure of Exploration Information, Mineral Resources, or Mineral Reserves. Additional visits may be needed at a frequency that is appropriate to the Competent Person's view of the risks, opportunities, and level of work being completed (exploration, resource definition, or reserve definition) and in consideration of access to the property. The documentation should contain the date(s) that the Competent Person visited the property.

Public Reporting—General

17. **Public Reports are reports on Exploration Information, Mineral Resources, or Mineral Reserves prepared by or for the Company holding the Mineral Deposit to inform outside parties, such as investors or potential investors and their advisors, or to satisfy regulatory requirements. Public Reports include, but are not limited to annual and quarterly Company reports, securities offering documents, press releases, information memoranda, technical papers, website postings, and public presentations.**

18. Public Reports dealing with Exploration Information, Mineral Resources, and/or Mineral Reserves should only use the terms set out in Figure 1 of the SME Guide.

Public Reports are prepared for different reasons and may contain more or less detail according to their intended purpose and audience. The content of a Public Report should be determined by the Competent Person to be appropriate for its use on the basis of relevance (materiality and transparency) and, where appropriate, backup documentation (such as audit reports) should be referred to or made available. Public Reports should have an effective date.

Reporting of factors and relevant assessment criteria listed in Table 1 of the SME Guide that are most likely to affect the accuracy of estimates made in the Public Report is required. The authors of Public Reports should both identify and evaluate these important factors within their reports. A Mineral Resource and/or Mineral Reserve statement is a summary report of the Mineral Resource and/or Reserve estimates, and should include discussion of key assumptions used in their derivation as per the guidelines in Table 1 of the SME Guide. Mineral Resource statements should include descriptions of the assumptions made that support reasonable prospects for their eventual economic extraction.

Sample formats for various types of Public reports are provided in Appendix D.

Where a particular Public Report addresses only some of the items in Table 1 of the SME Guide, the report should disclose its limited scope and should refer to the physical and/or digital media location and content of other information required for a complete evaluation of the Exploration Information, Mineral Resources, and Mineral Reserves being reported. While such limited-scope Public Reports are commonly prepared as part of the overall preparation of an evaluation, such Public Reports may contain information warranting public disclosure independent of the results of other studies, and the authors of such Public Reports should be cognizant of their responsibilities with respect to the principles of transparency, materiality and competency.

Demonstrating feasibility of eventual economic extraction is not required for reporting Exploration Information or Mineral Resources. However, Mineral Resources should be supported by reasonable prospects of eventual economic extraction. Particular attention should be given to all relevant information that increases or decreases the reasonable prospects that the project will result in eventual economic extraction.

A Company may disclose an historical estimate prepared by others of Mineral Resources and Mineral Reserves, using the original terminology, if the disclosure:

- *identifies the source and date of the historical estimate, including if available any existing supporting technical report;*
- *comments on the relevance and reliability of the historical estimate;*
- *to the extent known, provides the key assumptions, parameters, and methods used to prepare the historical estimate;*
- *states whether the historical estimate uses categories other than those set out in Figure 1 of the SME Guide and if so includes an explanation of differences;*
- *estimates the quantity of historically estimated Mineral Resources and Mineral Reserves that have been extracted, if any, since the date of the historical estimate;*
- *includes an assessment as to the portion of the historical estimate that could be considered to have reasonable prospects for eventual economic extraction and a mapping of the historical estimate to classes of Mineral Resources and Mineral Reserves contained in Figure 1 of the SME Guide;*
- *includes any more recent material estimates or data available to the Company;*
- *comments on what work needs to be done to upgrade or verify the historical estimate as current Mineral Resources or Mineral Reserves; and*

- *states with equal prominence that a Competent Person has not done sufficient work to classify the historical estimate as current Mineral Resources or Mineral Reserves, and that the Company is not treating the historical estimate as current Mineral Resources or Mineral Reserves.*

To avoid confusion, the Public Report should present the current estimate of Mineral Resources and Mineral Reserves as prepared by the Competent Person; in the absence of a current estimate, an historical estimate may be presented. Presentation of a series of estimates showing the changes in Mineral Resources and Mineral Reserves with time could be misinterpreted and is discouraged.

19. Public Reports concerning a Company's Exploration Information, Mineral Resources, or Mineral Reserves should include effective dates for the material information presented. All Public Reports should include a description of the style and nature of mineralization, and reports based on more advanced technical studies should include descriptions of geological interpretation, sampling and assaying, interpolation methods used, mining and processing methods, as well as discussion of other Modifying Factor assumptions and results.

20. A Company should disclose in its Public Reports all material information concerning the status and characteristics of a Mineral Deposit. A Company may also be obligated by applicable laws to update its Public Reports to reflect any material changes in such information.

21. Public Reports should contain an assessment of the critical risks to geometry, grade/quality, tonnage, or contained metal or product in the estimated Mineral Resources or Mineral Reserves. Risks associated with uncertainties in the Modifying Factors should also be identified. Opportunities for expanding the Mineral Resource or Mineral Reserves or for reducing the uncertainty of the Modifying Factors should also be discussed.

22. A Company should review and publicly report on its Mineral Resources and Mineral Reserves at least annually.

Reviews of Mineral Resources and Mineral Reserves should include the relevance of current technical and economic conditions compared to those which may have been applied when the Mineral Resources and Mineral Reserves were estimated. Relevant Assessment Criteria listed in Table 1 of the SME Guide and Modifying Factors should be reviewed. If necessary, technical and economic studies including Pre-Feasibility and Feasibility studies should be updated when there are material changes of a long-term nature (see Clause 40 below).

23. Holders of a royalty, streaming, or other similar interest in mineral properties (a Passive Interest) are not required to prepare Public Reports for disclosure of Exploration Information, Mineral Resources, or Mineral Reserves in respect of such Passive Interest.

Holders of Passive Interests that are reported publicly should review their Mineral Resources and Mineral Reserves at least annually.

A holder of a Passive Interest generally has no executive or operational interest or other participation in the mine or mineral property to which the Passive Interest relates. Rather, the holder's rights regarding the underlying mine or mineral property are defined by contract

terms and are typically limited to the right to receive specific information regarding production, marketing, and sale of minerals used by the Company to confirm calculation of royalty payments or stream deliveries as they are made periodically over time.

As such, the holder of a Passive Interest typically has limited or no access to mining operations or the underlying mineral properties to which the Passive Interest relates, nor to the extensive technical data and other information generated by or available to the owner or operator of the underlying mine or mineral property.

If the holder of a Passive Interest summarizes or reproduces any portion of a Public Report of Exploration Information, Mineral Resources, or Mineral Reserves relating to a mine or mineral property to which the Passive Interest applies, which Public Report was made available by owner or operator of the mine or mineral property, the Passive Interest holder may disclaim responsibility for the contents of the Public Report so long as the holder presents, fairly, in all material respects, the contents of the Public Report as it relates to the Passive Interest; provided however, that the holder should not summarize or reproduce any Public Report that the holder believes to be materially misleading or otherwise unreliable at the time of such summary or reproduction.

24. The reporting of Mineral Resources or Mineral Reserves for polymetallic deposits in terms of metal equivalents (a single equivalent grade of one major metal) is strongly discouraged. If used, the Public Report should show details of all material factors needed to calculate the contribution of each metal constituent. The following minimum information should be reported in reference to metal equivalents:

- individual grades for all metals included in the metal equivalent calculation;
- commodity prices (see Clause 53 below) for all metals, adjusted for smelter/refinery terms;
- metallurgical recoveries for all metals and discussion of the basis on which the recoveries are derived and used (metallurgical test work, detailed mineralogy, similar deposits, etc.);
- a clear statement that it is the Company's opinion that all the elements included in the metal equivalents calculation have a reasonable potential to be recovered and sold;
- any other relevant parameters useful for understanding the equivalent grade; and
- the calculation formula used.

In most circumstances, the metal chosen for reporting on an equivalent basis should be the one that contributes most to the metal equivalent calculation. If this is not the case, a clear explanation of the logic of choosing another metal should be included in the report.

Reporting on the basis of metal equivalents is never appropriate if metallurgical recovery information is not available or able to be estimated with reasonable confidence. For many exploration-stage projects, metallurgical recovery information may not be available or able to be estimated with reasonable confidence.

25. Public Reports on Mineral Resources should specify one or more of the geoscientific knowledge confidence classes of "Inferred," "Indicated," and "Measured." Reports should not

contain Inferred Mineral Resource figures combined with either of the other two classes. The Measured and Indicated classes can be combined only if also reported separately. A Mineral Resource should not be reported in terms of contained metal or product unless corresponding tonnage and grade figures are also presented. Mineral Resources should be specified as inclusive or exclusive of Mineral Reserves (See Clause 46).

26. Public Reports on Mineral Reserves should specify one or both of the classes of "Proven" and "Probable". Reports that combine Proven and Probable Mineral Reserve figures should provide estimates for each class. Reports should not present contained or recovered metal or product figures unless corresponding tonnage and grade figures are also presented. Where recovered metal and product are stated, recovery factors should be provided.

27. Mineral Resource and Mineral Reserve estimates in some cases are reported after the application of adjustments such as cutting of high grades, dilution, mining loss, mine or mill recovery, and "call factors". If Mineral Resource and Mineral Reserve estimates, or the data on which the estimates are based, are materially adjusted or modified for the purpose of making the estimate, this should be clearly stated in a Public Report. The nature of the adjustment or modification should be clearly described and quantified if possible.

28. Public reporting of specific tonnage and grade estimates other than Mineral Resources and Mineral Reserves is not permitted under the SME Guide. As stated in Clause 32 below, for more preliminary estimates such as Exploration Target definition, only ranges of estimated tonnages and grades are allowed and should be accompanied by sufficiently transparent language justifying and qualifying the estimated ranges.

> *Other estimates may be useful for a Company in its internal calculations and evaluation processes, but their inclusion in Public Reports could cause confusion and is therefore not permitted.*

29. Mineral Resource and Mineral Reserve estimates are not precise calculations. Tonnage and grade figures in reports should be expressed so as to convey the order of accuracy of the estimates by rounding off to appropriately significant figures.

> *To emphasize the imprecise nature of a Mineral Resource or Mineral Reserve, the final result should always be referred to as an estimate based on information available at the time of estimation, not as a calculation.*
>
> *Competent Persons are encouraged, where appropriate, to discuss the relative accuracy and/or confidence of the Mineral Resource and Mineral Reserve estimates. The statement should specify whether it relates to overall or local estimates, and, if local, state the applicable tonnage or volume. Where a statement of the relative accuracy and/or confidence is not possible, a qualitative discussion of the uncertainties should be provided.*
>
> *Depending on the accuracy of the estimate, rounding to the second or third significant figure should be sufficient. For example, 10,863,425 tons at 8.23 per cent zinc could be stated as 11 million tons at 8.2 percent or 10.9 million tons at 8.23 percent zinc.*

30. In addition to the various metals and other commodities that are being reported, the presence of materially deleterious elements, contaminants, or minerals that may affect workplace safety and environmental conditions, and processing and/or marketing of the saleable product should be disclosed to the extent known. Examples of such deleterious elements and minerals may include (but are not limited to) talc, asbestiform minerals, iron, arsenic, antimony, fluorine, mercury, thorium, uranium, beryllium, bismuth, cadmium, cobalt, chromium, and lead (where these are not a primary focus of exploration). In addition to these elements, the presence, or potential presence, of significant amounts of unwanted product or waste materials should be reported and the results of direct test work provided if available. If no direct test work has been performed, this should be stated.

Exploration Information

31. An Exploration Target represents a geological concept to be tested to determine the existence of a Mineral Deposit. Information gained through exploration is termed Exploration Results.

32. **An Exploration Target is a statement or estimate of the exploration potential of a Mineral Deposit in a defined geological setting where the statement or estimate, quoted as a range of tons and a range of grade or quality, relates to mineralization for which there has been insufficient exploration to estimate Mineral Resources.**

There should also be a proximate statement that the potential quantity and grade is conceptual in nature, that there has been insufficient exploration to define a Mineral Resource, and that it is uncertain if further exploration will result in the determination of a Mineral Resource or a Mineral Reserve.

> *It is recognized that it is common practice for a Company to comment on and discuss its exploration strategy in terms of target size and type. Any such information relating to Exploration Target size should not be expressed in a way that could be confused as an estimate of Mineral Resources or Mineral Reserves. Any statement referring to potential quantity and grade of the target should be expressed as ranges and should include a detailed explanation of the basis for the assumptions made and procedures used to estimate ranges of tonnage and grade or quality, and extent. The detailed explanation of the basis for the statement of a target should specifically discuss the geological setting and exploration strategy, exploration activity already completed, and the presence of or lack of the following attributes:*
>
> - *analogous deposit with a similar geological setting;*
> - *mineralized outcrops and assays;*
> - *surface geochemical and physical sampling results;*
> - *surface and subsurface geophysical survey results; and*
> - *drill holes, test pits, and underground workings.*
>
> *Proposed exploration activities designed to test the validity of an Exploration Target should be detailed and include the timeframe within which they are expected to be completed.*

33. **Exploration Results include data and information generated by mineral exploration programs that might be of use but which do not form part of a declaration of Mineral Resources or Mineral Reserves.**

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.

If a Company reports Exploration Results in relation to mineralization not classified as a Mineral Resource or a Mineral Reserve, then estimates of tonnages and average grade or quality should not be assigned to the mineralization unless the situation is covered in Clause 32 above, and then only in strict accordance with the requirements of that Clause.

Examples of Exploration Results include results of outcrop sampling, geological mapping, assays of drill hole intercepts, geochemical and physical test results, and geophysical survey results.

34. Public Reports of Exploration Results should contain sufficient information to allow a considered and balanced judgment of their significance. Reports should include relevant information such as effective date, exploration context, type and method of sampling, sampling intervals, relevant sample locations, distribution, dimensions and relative location of all relevant assay and physical data, data aggregation methods, land tenure status, plus information on any of the other criteria listed in Table 1 of the SME Guide that are material to such an assessment.

Public Reports of Exploration Results should not imply that potentially economic mineralization has been discovered. If appropriate to the deposit type, true widths of mineralized zones should be reported. Where true widths cannot be reported, an appropriate qualification should be included in the public report.

Where assay and analytical results are reported, they should be reported using one of the following methods, selected as the most appropriate by the Competent Person:

- *by listing all results, along with sample intervals (or size, in the case of bulk samples);*
- *by reporting weighted average grades of mineralized zones, indicating clearly how the grades were calculated; or*
- *by including representative sections and/or maps.*

Clear diagrams and maps designed to represent the geological context should be included in the Public Report. These should include, but not be limited to a plan view of material drill hole collar locations with geological features and appropriate sectional views including these geological boundaries. If drill holes are not considered to be material by the Competent Person, this should be explained in the Public Report.

Reporting of selected information such as isolated assays, isolated drill holes, assays of panned concentrates or supergene enriched soils or surface samples, without placing them in perspective in the report is unacceptable.

Table 1 of the SME Guide contains a checklist and guideline to which those preparing reports on Exploration Results should refer. The checklist is not prescriptive and, as always transparency and materiality are overriding principles that determine what information should be reported publicly.

Mineral Resources

35. **A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality, and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity, and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.**

Public Reports should include the effective date of the Mineral Resources.

Mineral Resources are subdivided, in order of increasing geoscientific confidence, into Inferred, Indicated, and Measured classes.

Portions of a Mineral Deposit that do not have reasonable prospects for eventual economic extraction should not be included in a Mineral Resource.

The term "Mineral Resource" encompasses mineralization (including, in certain instances, dumps and tailings) which has been identified within reasonable spatial limits and estimated through exploration and sampling and within which Mineral Reserves may be defined by the detailed consideration and application of Modifying Factors. Mineral Resources are based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes.

In some cases, both grade and quality are known, estimated, or interpreted from specific geological evidence and knowledge, including sampling. An example would be nickel and the silica/magnesia ratio in lateritic nickel deposits.

The term "reasonable prospects for eventual economic extraction" implies a judgment (albeit preliminary) by the Competent Person with respect to the technical and economic factors likely to influence the prospect of eventual economic extraction, including the approximate mining parameters, such as dilution, mining recovery, and minimum mining thickness. In other words, a Mineral Resource is not an inventory of all mineralization drilled or sampled, regardless of cut-off grade, likely mining dimensions, location, or continuity; rather it is a realistic estimate of mineralization which, under assumed and justifiable technical and economic conditions, might become economically extractable. Portions of a deposit that do not have potential for eventual economic extraction cannot be included. Portions of the deposit containing significant amounts of deleterious elements/minerals may be included, provided the products can be blended or otherwise beneficiated so as to marketable.

The term "reasonable prospects" implies that Measured, Indicated, and Inferred Mineral Resources are constrained within mining limits for surface mining methods and constrained

to coherent zones for underground extraction, both of which support mining, processing, and future development cost estimates. A deposit model is required, which may be a computer-generated block model or a model based on maps, plans or sections. If necessary, viable beneficiation process(es) should be identified to meet the criteria for reasonable prospects. Economic criteria should be applied in a similar manner to all classes of Mineral Resources (Measured, Indicated, and Inferred). Support for all material assumptions made in determining the reasonable prospects for eventual economic extraction should be documented.

Interpretation of the word "eventual" in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron ore, bauxite, and other bulk minerals or commodities, it may be reasonable to envisage eventual economic extraction as covering time periods in excess of 50 years. For many smaller deposits, application of the concept would normally be restricted to perhaps 10–15 years and frequently to much shorter periods of time. Interpretation and judgment of the word "eventual" is the responsibility of the Competent Person.

Commodity prices used in Mineral Resource reporting should be based on a reasonable and supportable range of commodity prices (see also Clauses 53–57 below). If prices used for Mineral Resource estimation differ from those used for Mineral Reserve reporting, these differences should be documented and supported.

Mineralized stope fill, mineralized in situ remnants, shaft and stope pillars left for ground support purposes, and stockpiles of mineralized material, old dumps and tailings can be considered when reporting Mineral Resources provided they have reasonable prospects for eventual economic extraction.

When publicly reporting Mineral Resource estimates, a statement should be made that, while the estimate of Mineral Resources is based on the Competent Person's judgment that there are reasonable prospects for eventual economic extraction, no assurance can be given that Mineral Resources will eventually convert to Mineral Reserves. Consideration should also be given to inclusion of the reasons why a reported Mineral Resource was not reported as a Mineral Reserve, e.g.*, capital requirement to develop the project may not have been approved.*

*Certain Public Reports (*e.g.*, inventory reports, exploration reports to a government, and other similar reports not intended for providing information for investment purposes) may require full disclosure of all mineralization, including some material that does not have reasonable prospects for eventual economic extraction. Such estimates of mineralization would not qualify as Mineral Resources (either current or historical) by this definition, and therefore should not be included in Public Reports that may be used by or accessible to investors or potential investors and their advisers.*

The terms "Coal Resources" and Mineral Resources can be used interchangeably where it is customary to do so, for coal deposits. Likewise, "Diamond Resources" or "In Situ Recovery (ISR) Resources" may be used; see Clauses 74 to 76, and Clause 78 below.

Table 1 of the SME Guide contains a checklist and guidelines to which those preparing reports on Mineral Resources should refer (in particular, uncertainties with respect to geological interpretations, the geometry of mineralization boundaries, sampling and assay data, and estimates of grade and tonnage). Table 1 of the SME Guide is not prescriptive and, as always transparency and materiality are overriding principles which determine what information should be reported publicly.

36. **An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.**

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and should not be converted directly to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

The "Inferred" class is intended to cover situations where a mineral concentration or occurrence has been identified and limited measurements and sampling completed, but the data are sufficient to allow the inference of geological (and grade or quality) continuity. An Inferred Mineral Resource can be based on interpolation between widely spaced data where there is reason to expect geological continuity of mineralization, but not excessively extrapolated from the data. The proportion of extrapolated Mineral Resource outside the nominal drill grid spacing should be limited and disclosed.

Confidence in the estimate is sufficient to allow the application of assumed but not verified technical and economic parameters for conceptual planning. However, confidence is often not sufficient to allow the results of the application of these technical and economic parameters to be used for incremental planning and production scheduling. For this reason, there is no direct link from an Inferred Mineral Resource to any class of Mineral Reserves (see Figure 1 of the SME Guide). Caution should be exercised if Inferred Mineral Resources are considered in technical and/or economic studies. Inferred Mineral Resources may be considered for mine designs used to estimate Mineral Reserves. However Inferred Material should not be reported as Mineral Reserves and should be treated as waste in the economic analysis supporting the Reserve Test (see Clause 48 below). The manner in which Inferred Mineral Resources are used in mine designs used to estimate Mineral Reserves and the effect on the resulting Mineral Reserves should be estimated, and attendant risks disclosed.

Inferred Mineral Resources should exclude material for which there are insufficient data to allow the inference of geological and grade continuity. Inferred Mineral Resources are intended to be sufficiently defined that their overall tonnages, grades or qualities, and mineral contents can be estimated with a reasonable level of confidence.

In some operating mines, additional geological sampling may be the only information needed to support an upgrade from an Inferred Mineral Resource to an Indicated or Measured Mineral Resource.

37. **An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing, and is sufficient to assume geological and grade or quality continuity between points of observation.**

An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

> *A Mineral Deposit or part of a deposit may be classified as an Indicated Mineral Resource in a Public Report when the nature, quality, amount, and distribution of data are such as to allow the Competent Person determining the Mineral Resource to confidently interpret the geological framework and to assume physical continuity of mineralization. Confidence in the estimate is sufficient to allow the appropriate application of technical and economic parameters to prepare incremental mine plans (typically annual or phases) and production schedules and to enable an evaluation of economic viability. Overall confidence in the estimates is high, while local confidence is reasonable. The Competent Person should recognize the importance of the Indicated Mineral Resource class to the advancement of the project. An Indicated Mineral Resource estimate is of sufficient quality to support detailed technical and economic studies leading to Probable Mineral Reserves which can serve as the basis for major development decisions.*
>
> *In assessing continuity between points of observation, the Competent Person should consider the likely cut-off grade and geometric limits that would be used to prepare incremental (*e.g.*, annual or phased) mine plans.*

38. **A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling, and testing and is sufficient to confirm geological and grade or quality continuity between points of observation.**

A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

> *A Mineral Deposit or part of a deposit may be classified as a Measured Mineral Resource when the nature, quality, amount, and distribution of data are such as to leave no reasonable doubt, in the opinion of the Competent Person determining the Mineral Resource, that the tonnage, grade, geometry of production planning, and scheduling increments can be estimated within close limits and that any variation from the estimate would not significantly affect potential economic viability of individual increments (typically quarterly or smaller). This class requires a high level of confidence in, and understanding of, the geology and controls of the Mineral Deposit. A Measured Mineral Resource estimate is of sufficient quality to support detailed technical and economic studies leading to Mineral*

Reserves which can serve as the basis for major development decisions with no additional sampling or other geological definition required to support these decisions.

39. The choice of the appropriate class of Mineral Resource depends upon the quantity, distribution, and quality of data available, the level of confidence that attaches to those data, and the specific details of the estimation methodology applied. The appropriate Mineral Resource class should be determined by the Competent Person.

Mineral Resource classification is a matter for skilled judgment, and the Competent Person should take into account those items in Table 1 of the SME Guide which relate to confidence in Mineral Resource estimation.

In deciding between Measured Mineral Resource and Indicated Mineral Resource, the Competent Person may find it useful to consider, in addition to the phrases relating to geological and grade continuity in Clauses 37 and 38 above, (i) the phrase in the guideline to the definition for Measured Mineral Resource: ".... any variation from the estimate would not significantly affect potential economic viability of individual increments (typically quarterly or smaller)" and (ii) the guideline to the definition for Indicated Mineral Resource in Clause 37 above "Confidence in the estimate is sufficient to allow the appropriate application of technical and economic parameters to prepare incremental plans (typically annual or phased) and production schedules and to enable an evaluation of economic viability", which contrasts with the guideline to the definition for Inferred Mineral Resource in Clause 36 above: "Confidence in the estimate is sufficient to allow the application of assumed but not verified technical and economic parameters for conceptual planning".

Where deleterious elements/minerals are present that may have an impact on application of the Modifying Factors, their impact should be taken into account when classifying the Mineral Resources as Inferred, Indicated, or Measured.

40. The words "ore" and "reserves" should not be used in stating Mineral Resource estimates as the terms imply that technical feasibility and economic viability have been demonstrated. Such terms are only appropriate when all relevant mining, processing, metallurgical, economic, marketing, legal, environmental, infrastructure, social, and governmental factors have been considered. Reports and statements should continue to refer to the appropriate class or classes of Mineral Resources until technical feasibility and economic viability have been established by appropriate studies. If re-evaluation indicates that the Mineral Reserves are no longer viable, the Mineral Reserves should be reclassified as Mineral Resources or removed from Mineral Resource/Mineral Reserve statements altogether, as applicable in the given case.

It is not intended that reclassification from Mineral Reserves to Mineral Resources should be applied as a result of changes expected to be of a short-term or temporary nature, or where the Company has made a deliberate decision to operate on a non-economic basis. Examples of such situations might be a commodity price decrease expected to be of short duration, mine emergency of a non-permanent nature, transport strike, etc.

Mineral Reserves

41. **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 or extracted and is defined by appropriate level of study at Pre-Feasibility, Feasibility, or equivalent, that includes the application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The reference point at which Reserves are defined, usually the point where the ore is delivered to the processing plant, should be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.**

> *Mineral Reserves are those portions of Mineral Resources that result in an estimated tonnage and grade that, in the opinion of the Competent Person making the estimates, can be the basis of an economically viable project after taking account of all relevant Modifying Factors. Mineral Reserves are subdivided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. The term "economically viable" implies that extraction of the Mineral Reserve has been established or analytically demonstrated (*e.g.*, such as by a cash flow in the report) to be viable and justifiable under reasonable investment and market assumptions. Exploration Targets and Inferred Mineral Resources must be excluded from demonstration of economic viability to support declaration of a Mineral Reserve. The term "Mineral Reserve" need not necessarily signify that extraction facilities are in place or operative, or that all governmental approvals have been received. It does signify that there are reasonable expectations of timely approvals.*
>
> *This guidance does not imply that an economic operation should have Proven Mineral Reserves. Situations arise where Probable Mineral Reserves alone may be sufficient to justify development and operation, for example, deposits to be exploited by deep underground mines. Indeed, Mineral Reserves may not be required for a Company to decide to proceed with the development and extraction of a Mineral Deposit. For example, in the case of gold placer deposits, the amount of sampling required to demonstrate that Mineral Reserves exist can be prohibitively expensive. Other examples include gemstones mined from pegmatites, and uranium deposits extracted using in situ recovery. In such cases, appropriate discussion of the risks and benefits of proceeding without delineating Mineral Reserves should be made in the Public Report.*
>
> *At recently or currently operating properties (brownfield projects) an economic life-of-mine plan can be considered as the appropriate level of study for the reporting of Mineral Reserves, unless those Reserves require significant new infrastructure, such as a new shaft or a new processing method and associated plant.*
>
> *The terms "Ore Reserves" and "Mineral Reserves" can be used interchangeably where it is customary to do so, usually for metallic deposits and some industrial minerals. The terms "Coal Reserves" and "Mineral Reserves" can be used interchangeably where it is customary to do so, for coal deposits. Likewise, "Diamond Reserves" or "In Situ Recovery (ISR) Reserves" may be used; see Clauses 74 to76, and Clause 78 below.*

Table 1 of the SME Guide contains a checklist and guidelines to which those preparing reports on Mineral Reserves should refer. The checklist is not prescriptive and, as always transparency and materiality are overriding principles that determine what information should be reported.

42. **A Probable Mineral Reserve is the economically mineable part of an Indicated and, in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.**

When the confidence in the Modifying Factor(s) is lower than that required to estimate a Proven Mineral Reserve, a Measured Mineral Resource may be reclassified as a Probable Mineral Reserve.

A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve but is sufficient to serve as the basis for a decision to develop the deposit.

43. **A Proven Mineral Reserve is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.**

A Proven Mineral Reserve represents the highest degree of confidence in the estimate. The style of mineralization or other factors could mean that a Proven Mineral Reserve cannot be demonstrated in some deposits. Competent Persons should be aware of the consequences of declaring a Proven Mineral Reserve before satisfying themselves that all of the relevant Mineral Resource parameters and Modifying Factors have been established at a similarly high level of confidence.

Issues with the confidence in the Modifying Factors could mean that some Measured Mineral Resources may not be converted to a Proven Mineral Reserve.

44. The selection of the appropriate class of Mineral Reserve is determined primarily by the classification of the corresponding Mineral Resource and after considering any uncertainties in the Modifying Factors. Allocation to the appropriate class should be made by the Competent Person.

The SME Guide provides for a direct relationship between Indicated Mineral Resources and Probable Mineral Reserves and between Measured Mineral Resources and Proven Mineral Reserves. In other words, the level of geoscientific confidence for Probable Mineral Reserves is at least as high as that required for the determination of Indicated Mineral Resources, and the level of geoscientific confidence for Proven Reserves is the same as that required for the determination of Measured Mineral Resources.

The SME Guide provides for a two-way relationship between Measured Mineral Resources and Probable Mineral Reserves. This is to cover the situation where uncertainties associated with any of the Modifying Factors considered when converting Mineral Resources to Mineral Reserves may result in there being a lower degree of confidence in the Mineral Reserves than

in the corresponding Mineral Resources. Such a conversion would not imply a reduction in the level of geoscientific knowledge or confidence.

If the uncertainties in the Modifying Factors that prevented the Measured Mineral Resource being converted to a Proven Mineral Reserve are removed, then the Measured Mineral Resource may be converted to a Proven Mineral Reserve. No amount of confidence in the Modifying Factors for conversion of a Mineral Resource into a Mineral Reserve can override the upper level of confidence which exists in the Mineral Resource. Under no circumstances can an Indicated Mineral Resource be converted to a Proven Mineral Reserve, unless new information first justifies conversion to a Measured Mineral Resource. Except as noted in the guidance to Clause 6, an Inferred Mineral Resource cannot be converted to a Mineral Reserve unless first converted to an Indicated or Measured Mineral Resource.

45. Public Reports on Mineral Reserves should specify one or both of the classes of "Proven" and "Probable." Reports that combine Proven and Probable Mineral Reserve figures should provide estimates for each class as well. When reporting a Mineral Reserve, tonnages, grades and mineral or metal contents should be reported after taking into account mining loss and mining dilution. Saleable contents including the point of sale (reference point) can be reported after taking into account processing (sometimes called metallurgical) recoveries. If processing recoveries are not taken into account, the percentage expected to be recovered or lost during processing should be reported. Public Reports should include the effective date of the Mineral Reserves.

46. When estimates for both Mineral Resources and Mineral Reserves are reported, the Public Report should include a statement that clearly indicates whether the Mineral Resources are inclusive of, or exclusive of those Mineral Resources that have been modified to produce Mineral Reserves.

For transparency, it is preferred that Mineral Resources be reported as exclusive of Mineral Reserves. However, in some situations, there are reasons for reporting Mineral Resources inclusive of Mineral Reserves. It should be made clear which form of reporting has been adopted. Appropriate forms of clarifying statements may be:

- *"The Measured and Indicated Mineral Resources are exclusive of (in addition to) Mineral Reserves."; or*
- *"The Measured and Indicated Mineral Resources are inclusive of those modified to produce Mineral Reserves."*

In the latter instance, if any portions of Measured and Indicated Mineral Resources have not been modified to produce Mineral Reserves, the relevant details (primarily grade and tonnage) of these unmodified Mineral Resources should be included in the report. This is to assist the audience of the report in forming an opinion of the likelihood of the unmodified Measured and Indicated Mineral Resources eventually being converted to Mineral Reserves. The exception for deposits where geology is the only missing material information described in the guidance to Clause 44 above is applicable.

Mineral Resources (whether inclusive or exclusive of Mineral Reserves) should be tabulated separately from Mineral Reserves. If Mineral Resources are reported exclusive of Mineral Reserves, they should not be aggregated because the resulting total will be misleading and may be misunderstood to give a false impression of the economic potential of a project.

In cases where ''the exception for deposits where geology is the only missing material information'' described in the guidance to Clause 44 above applies and where the quantities and grade of the estimated Mineral Resources and estimated Mineral Reserves are the same (an inclusive case), the estimates can be disclosed in a single table in which both the in situ or contained estimate and the saleable estimate are disclosed in separate columns along with appropriate disclosure in the discussion of the table.

47. Public reporting of a Mineral Reserve will normally indicate that a Company has the intention to mine, or that a tangible asset has been defined by the Company for potential sale or lease.

Where Mineral Reserves have been defined, but are scheduled to be mined in the future, sufficient assurance should be available on an annual basis that, in the judgment of the Competent Person, and endorsed by the Company, that application of the Modifying Factors continues to support the Company's disclosure of Mineral Reserves in the Public Report.

48. A Reserve Test should be conducted at least annually for Mineral Reserves to verify that at a minimum the future undiscounted cash flow from reserves is positive (see also Clause 22 above). The cash flow ignores all sunk costs and only considers future operating (including royalties and severance taxes) and closure costs as well as future capital costs. The Reserve Test should use commodity price(s) as discussed in Clause 53 below, and/or, if applicable, contractual prices.

If the Reserve Test has a negative cash flow, part of the higher cost panels or phases in the Mineral Reserve estimate may need to be eliminated to achieve positive cash flow. If a positive cumulative cash flow cannot be achieved, a Mineral Reserve can no longer be reported. If Inferred Mineral Resources are used in the development of the mine plans and production schedules, they should be treated as waste in the Reserve Test. It is expected that the Company will attempt to achieve an acceptable return on capital invested.

Technical Studies

49. Study definitions are included in the SME Guide to provide clarity on what is expected when reporting using the terms "Scoping Study," "Pre-Feasibility Study," or "Feasibility Study" to describe specific types of Public Reports. The definition of a Scoping Study has been included because of the common usage of the term in Public Reports.

Attention is drawn to the requirement for a Pre-Feasibility Study or a Feasibility Study to have been completed for the Public Reporting of a Mineral Reserve in Clause 41 above. A Mineral Reserve should not be reported based on the completion of a Scoping Study. Table 1 of the SME Guide shows typical assessment criteria for Technical Studies. Table 2 of the SME Guide shows the range of accuracy of cost estimates for Technical Studies. At operating

properties (brownfield projects) an economic life-of-mine plan can be considered as the appropriate level of study (e.g., Pre-Feasibility or Feasibility) for the reporting of Mineral Reserves, unless those reserves require significant new infrastructure, such as a new shaft or a new processing method and associated plant.

Formal assessment of relevant criteria, as listed in Tables 1 and 2 of the SME Guide, is required in order to determine how much available Measured and Indicated Mineral Resource may be converted to Mineral Reserves.

It is recognized that as projects develop the Mineral Resources may change as a result of continued exploration, and changes in the Modifying Factors may cause changes in the Mineral Reserves. These changes may result in multiple technical studies or updates to previous studies.

50. **A Scoping Study is an order of magnitude technical and economic study of the potential viability of Mineral Resources that includes appropriate assessments of realistically assumed Modifying Factors together with any other relevant operational factors that are necessary to demonstrate that at the time of reporting that progress to a Pre-Feasibility Study can be reasonably justified.**

Scoping Studies are commonly early economic evaluations of a project and may be based on a combination of directly gathered project data together with assumptions sourced from similar deposits or operations to the case envisaged. Scoping Studies are also commonly used internally by Companies for comparative and planning purposes. Reporting the general results of a Scoping Study needs to be undertaken with care and should include appropriate proximate cautionary statements that there is no implication that Mineral Reserves have been established or that economic development is assured. In this regard, it may be appropriate to indicate the Mineral Resource inputs to the Scoping Study and the processes applied. Scoping Studies should not include Exploration Targets as part of the mine plan or economic analysis. If the Scoping Study is partially or wholly supported by Inferred Mineral Resources, this should be clearly stated, and a proximate cautionary statement should be included (refer to Appendix F).

Scoping Studies can also be called Preliminary Economic Assessments. "Order of magnitude" as used herein typically implies low accuracy cost estimates (see Table 2 of the SME Guide).

51. **A Pre-Feasibility Study is a comprehensive study that may include a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method, in the case of underground mining, or the pit configuration, in the case of an open pit (surface) mine, is established and an effective method of mineral processing is determined. It includes a financial analysis based on applicable Modifying Factors and the evaluation of any other relevant factors which are sufficient for a Competent Person, acting reasonably, to determine if all or part of the Mineral Resource may be converted to a Mineral Reserve at the time of reporting. A Pre-Feasibility Study is at a lower confidence level than a Feasibility Study.**

A Pre-Feasibility Study will consider the application and description of Modifying Factors to demonstrate economic viability of Measured and Indicated Mineral Resources to support declaration of a Mineral Reserve.

Exploration Targets and Inferred Mineral Resources should be excluded from demonstration of economic viability in support of declaration of a Mineral Reserve, and should be excluded from the Pre-Feasibility study economic analysis. Inferred Mineral Resources should be excluded from Pre-Feasibility Study mine plans and production schedules.

A Pre-Feasibility Study will identify the preferred mining, processing, and infrastructure requirements and capacities, but the Company may not have finalized these matters. Assessments of environmental and socio-economic impacts and requirements will be well advanced (refer to Table 1 of the SME Guide, Articles G and H). A Pre-Feasibility Study will highlight areas that require further refinement within the Feasibility Study stage.

52. **A Feasibility Study is a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable Modifying Factors together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate at the time of reporting that extraction is reasonably justified (economically mineable). The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project. The confidence level of the study will be higher than that of a Pre-Feasibility Study.**

A Feasibility Study is of a higher degree of accuracy than a Pre-feasibility Study and would normally contain mining, infrastructure, and process designs completed with sufficient rigor to serve as the basis for an investment decision or to support project financing. The Feasibility Study will contain the application and description of relevant criteria (as outlined in Tables 1 and 2 of the SME Guide) in a more detailed form or with more certainty than the Pre-feasibility Study, and will address detailed mining schedules, construction and production ramp up, and project execution plans.

Exploration Targets and Inferred Mineral Resources should be excluded from demonstration of economic viability in support of declaration of a Mineral Reserve, and should be excluded from the Feasibility Study economic analysis. Inferred Mineral Resources should be excluded from Feasibility Study mine plans and production schedules.

Terms such as "Full," "Final," "Comprehensive," "Bankable," or "Definitive" Feasibility Study are noted as being equivalent to a Feasibility Study; however, their use should be discouraged to avoid potential confusion.

The SME Guide does not require that a Feasibility Study has been undertaken to convert Mineral Resources to Mineral Reserves, but it does require that at least a Pre-feasibility Study will have determined that the mining project is technically and economically feasible, and that relevant Modifying Factors have been considered for such a conversion. However, there may be some projects for which the Competent Person determines that a Feasibility Study, instead of a Pre-Feasibility Study, is required before the Mineral Resources may be converted to Mineral Reserves due to uncertainties in the Modifying Factors.

Commodity Pricing and Marketing

53. Commodity prices and sales volume expectations used for the determination of Mineral Resources and Mineral Reserves should be based on forward-looking estimates reflecting the Company's reasonable and supportable short- and long-term expectations as supported by available evidence, which may include consensus forecasts, three-year trailing averages, sales contracts, or other price analyses (see Clause 57 below for cases where public disclosure is not appropriate). The basis for the selected prices and sales volumes should be supported by appropriate documentation. The Competent Person should ascertain that these prices and volumes are consistent with sales agreements and marketing determinations or forecasts. Under certain circumstances, it may be appropriate to use different prices for estimating Mineral Resources and Mineral Reserves.

54. For current mining operations, the price and volume profile used for Mineral Resources and Mineral Reserve estimation can reflect current market conditions for short-term forecasts, while trending with time upward or downward toward the long-term price and volume estimates based on the Company's expectations. For Mineral Reserves that are expected to be produced beyond the validity of short-term forecasts, the Company should use long-term price and volume expectations.

55. For commodities sold under existing contracts, Mineral Reserves should be determined based on contract terms. For Mineral Reserves whose production would extend beyond the quantities specified in existing contracts, reasonable and supportable assumptions should be made to determine the likelihood of contract renewal and prices applicable for the estimation and reporting of these Mineral Resources and Mineral Reserves.

56. To demonstrate the economic feasibility of a Mineral Reserve, the estimated prices, combined with Modifying Factors, should be applied to only Measured and Indicated Mineral Resources.

> *Mineral Reserves are the economically mineable part of a Measured or Indicated Mineral Resource; hence, appropriate assessments should demonstrate at the time of reporting that extraction is reasonably justified. This requires that assumptions are made concerning the price of the commodity or product that will be sold when the mine is in production.*
>
> *Mineral Reserves are estimated and published to supply information concerning the value of the deposit and the risk which may be associated with its development. Mineral Reserves are used by a Company, in conjunction with Mineral Resources, for short-term, long-term, and strategic planning. They play a critical role in accounting, including impairment testing, fair value accounting, calculation of depreciation, depletion, and accumulated retirement obligation provision rates. To supply information consistent with the Company's plans and financial reporting, commodity prices used for the determination of Mineral Reserves should be based on forward-looking estimates reflecting the Company's reasonable expectations as supported by all available evidence.*

Most commodities, whether sold using publicly quoted prices (e.g., base metals and precious metals) or under long term contract (e.g., coal and iron ore), experience long-term price cycles. Price expectations should reflect current prices as well as long-term trends. Overly optimistic or pessimistic price expectations could result in significant over or underestimation of Mineral Reserves. It is the responsibility of the Company and the Competent Person to determine whether the prices used for Mineral Reserve estimation are reasonable and supportable, given all available information.

During periods of low prices, a mining Company may choose to temporarily curtail operations and conserve the mineral asset until prices recover. When such actions are taken, Public Reports should be updated to reflect the new information. In such circumstances, previously published Mineral Reserves may not have to be reclassified, provided that, in the opinion of Company and the Competent Person, higher future prices can be reasonably and supportably assumed, and it can reasonably expected that operations will be resumed.

The documentation supporting the Company's expectations should include: comparison of prices with historical and current prices and forward curves, contracts and market considerations, currency exchange rates where applicable, third party sources, and supplemental information.

57. Disclosure in Public Reports of the commodity prices and sometimes also the costs (including other Modifying Factors) used for Mineral Reserve estimation is generally required by the SME Guide. In the absence of applicable securities or other laws to disclose prices, there may be cases, such as when a product is sold under long-term contract, the terms of which should be kept confidential, where there are valid commercial reasons for non-disclosure of prices. Similarly, where disclosure of the long-term price and/or cost assumptions used in the estimation would be detrimental to the Company's business, such as when bidding for sales contracts or property acquisitions or negotiating agreements with third parties, non-disclosure may be justifiable. Whenever prices and/or costs are not disclosed, the reasons should be documented, and the commodity price and/or cost information should nevertheless be available for review by auditors or regulators if required. Even when commodity prices and/or costs are excluded from a Public Report, a description of the methodology used to determine the prices and/or costs should be disclosed. Such disclosure should be in a form which helps the audience of the Public Report to form an opinion that prices and/or costs used represent reasonable views of future prices and/or costs. The exceptions to disclosure of commodity prices and/or costs suggested by this Clause 57 are subject to, and overruled by, any obligations imposed by applicable securities or other laws.

Mineral Title and Permitting Requirements

58. For a Mineral Deposit to be considered a Mineral Reserve, it is required that legally enforceable mineral title sufficient for exploration, development, and extraction is controlled by the Company at the time of determination of Mineral Reserves. If the Company is leasing or sub-leasing the mineral, the lease or sub-lease should be from the holder of the necessary mineral titles.

Supporting documentation should include a brief description of the title, claim, mineral tenure (exploration or exploitation), lease or option under which the Company has the right to hold or operate the property, indicating any conditions that the Company should meet in order to obtain or retain the property. If material and permitted by agreements, royalty terms and claw-back rights of former claim holders should be disclosed. If held by leases or options, the expiration dates of such leases or options should be stated. If extension of leases or options will be needed to mine the Mineral Reserves, there should be reasonable expectation that such extension will be granted.

59. If a Company has title to a Mineral Deposit (title holder) and intends to report Mineral Resources and/or Reserves, and also licenses, leases, or subleases certain Mineral Resources and/or Reserves to another entity for economic consideration, the Mineral Resources and/or Reserves that have been licensed, leased, or subleased, should be reported as a subset of the total Mineral Resources and/or Reserves.

If a Company has licensed, leased, or subleased Mineral Resources and/or Reserves from another title holder, the Mineral Resources and/or Reserves that have been licensed, leased, or subleased, should be shown as a subset of the Company's total Mineral Resources and/or Reserves.

This requirement for additional disclosure is particularly relevant to mineral holding companies whose business is leasing mineral properties, or production sharing.

60. There should be no known material obstacles to exploration or mining, such as those which could prevent exploration or mining activity, or cause shut down of mines or processing plants, or failure to obtain permits or any required license to explore or operate. There should be a reasonable expectation by the Competent Person (whether through reliance on legal and permitting specialists or otherwise) that permits, ancillary rights (including surface and water rights), and authorizations required for mining, and to the extent applicable, processing and marketing, can be obtained in a timely fashion, and maintained for ongoing operations.

The Company should review applicable legal and permitting requirements and document the results of this review. Local environmental laws and processes should be taken into account. To demonstrate reasonable expectation that all key permits, ancillary rights, and authorizations can be obtained, the Company should show understanding of the procedures to be followed to obtain such permits, ancillary rights, and authorizations. Demonstrating earlier success in obtaining the necessary permits can be used to document the likelihood of future success.

Information that materially increases or decreases the risk that the necessary legal rights or permits will be obtained should be publicly disclosed by the Company. It is recognized that the legal and permitting environment may change over time and that such changes could have an impact on Mineral Reserve estimation. If it is determined that obstacles arise or are eliminated, the Mineral Reserve estimates should be adjusted accordingly.

It is recognized that some permits cannot be obtained until after a Mineral Reserve has been estimated. There might be sound business reasons why obtaining some permits should be postponed. It is also recognized that waiting for all permits to be in hand could result in

critical information not being released in a timely fashion, and therefore it is recommended that disclosure of material information occur prior to obtaining permits as appropriate.

Information relating to review of legal and permitting issues may remain confidential to the Company. However, when required, it may be released to regulators or auditors on a confidential basis.

Environmental, Social, and Health and Safety Considerations

61. Reports supporting Mineral Resource and Mineral Reserve estimates should take into account environmental, social (sustainability), and health and safety impacts that are expected during development, operation, and after closure. Past achievements should be used to engage all stakeholders and to plan for continued benefits for all concerned parties.

The Competent Person should review reasonably available and relevant information on environmental, health, permitting, and social or community considerations related to the project and its stage of development. Consideration should be given to include, where relevant a discussion of:

- *a summary of the results of any environmental and/or health studies and a discussion of any environmental issues that could materially impact the Company's ability to extract the Mineral Resources or Mineral Reserves;*
- *requirements and plans for stockpiles, waste and tailings disposal, site monitoring, and water management both during operations and post mine closure;*
- *key project permitting requirements, the status of any such permit applications, and any known requirements to post performance or reclamation bonds;*
- *potential social or stakeholder considerations for the project and the status of any major negotiations or agreements with local communities;*
- *projected mine closure (remediation and reclamation) requirements and costs;*
- *special capital or operating requirements for handling toxic minerals or reagents, as well as other health and industrial hygiene risks; and*
- *if applicable, "Conflict Minerals" should be considered and discussed.*

Mineralized Fill, Pillars, Low-Grade Mineralization, Stockpiles, Dumps and Tailings

62. Mineralized stope fill and stockpiles of mineralized material can be considered to be similar to *in situ* mineralization when reporting Mineral Resources and Mineral Reserves. Consequently, the Competent Person carrying out the assessment of the fill or stockpiles should use the Mineral Resource and Mineral Reserve classes stated in the SME Guide. The Competent Person should review the minability of fill, remnants, and pillars.

Stockpiles are defined to include both surface and underground stockpiles, including broken ore in stopes, and can include ore currently in the ore storage system. Stockpiles in the course of being processed (including leaching), if reported and of economic importance, should be reported separately together with the basis for estimation. If some portion is

currently sub-economic, but there is a reasonable expectation that it will become economic, then this material may be classified as a Mineral Resource. Such stockpile material may include old dumps and tailings storage facility material. If technical and economic studies have demonstrated that economic extraction could reasonably be justified under realistically assumed conditions, then the material may be classified as a Mineral Reserve.

Mineralized remnants, shaft pillars and mining pillars which are potentially mineable and meet the requirements of having reasonable prospects for eventual economic extraction are in situ mineralization and consequently are included in the definitions of Mineral Resources and Mineral Reserves in the SME Guide.

Because processing recoveries for previously mined material (mineralized fill, stockpiles, dumps, and tailings) are usually different from those expected from un-mined in situ material, the Competent Person should make a judgment regarding the required direct sampling and test work to support processing recoveries that can be expected from these types of materials.

For historic tailings, surface or underground stockpiles and waste dumps, production records may not be available describing these materials in sufficient detail. In these cases, the contained grade(s) of the material should be defined by additional sampling. In some cases, it may be difficult to define the grade adequately due to sampling issues. In such cases the Competent Person should be cautious when seeking to define the estimated grade and the classification of such material. For clarity of understanding, it is recommended that tonnage and grade estimates of such materials be itemized separately in Public Reports if they are of material quantity.

The above guidelines apply equally to low-grade in situ mineralization, sometimes referred to colloquially as "mineralized waste" or "marginal-grade material," and often intended for stockpiling and treatment towards the end of mine life. For clarity of understanding, it is recommended that tonnage and grade estimates be itemized separately in Public Reports.

Exploration Information for Coal, Coal Resources and Coal Reserves

63. Coal generally is sold on the basis of product specifications and market acceptance. Such factors as quality and marketability are therefore important and should be considered carefully before declaring Coal Resources or Coal Reserves. Unless otherwise stated, Clauses 1 to 61 above in the SME Guide (including Figure 1 and Tables 1 and 2) apply to Exploration Information, Mineral Resources, and Mineral Reserves for coal.

When reporting information and estimates for coal deposits, the key principles and purpose of the SME Guide apply and should be borne in mind. The requirements for coal are generally similar to those for other commodities with the replacement of terms such as "mineral" by "coal" and "grade" by "quality". Because of coal-specific characteristics—including (i) geological continuity over large areas, (ii) the strategic value of controlling long-term reserves, and (iii) product pricing highly dependent on deposit location and coal quality—the

most significant requirements which should be satisfied before a Coal Resource or a Coal Reserve is estimated are not necessarily the same for coal as they are for other minerals.

64. The terms "Mineral Resource" and "Mineral Reserve", and the subdivisions of these terms as illustrated on Figure 1 of the SME Guide, apply also to coal reporting, but the Company may, in its discretion, elect to substitute the terms "Coal Resource" and "Coal Reserve" along with the appropriate class subdivisions. In both cases the reference point (dry, wet, in situ, washed, saleable, etc.) should be stated.

When reporting Coal Reserves, a clear distinction should be made between reserves where mining losses have been taken into account (sometimes described as "recoverable" or "run-of-mine") and saleable product where both mining and processing losses have been included (sometimes referred to as marketable reserves). All reserves, by definition, include mining losses and dilution, and the use of superfluous description is discouraged. In situ coal is, also by definition, limited to Coal Resources. For Coal Resources that are reported on an in situ basis, the Competent Person should comment on the expected dilution and mining recovery that would occur during operations. As for all minerals, Coal Resources should pass the test for reasonable prospects for eventual economic extraction, with special consideration to geographical access and likelihood of obtaining permits.

65. As for all minerals, it is the responsibility of the Competent Person to determine in each particular situation which specific requirement should be satisfied before a Coal Resource or a Coal Reserve can be estimated. The Competent Person should determine which evaluation criteria in Table 1 of the SME Guide are applicable, which additional evaluation criteria should be taken into account if any, and the relevance of such criteria.

Many criteria listed in Table 1 of the SME Guide which may be critical to the evaluation of other Mineral Deposits, such as base metals or precious metals, will not apply to the evaluation of Coal Deposits. Such criteria as coal quality, cost to markets including transportation cost, location and quality of competing coal reserves, and ability to compete in the market with such coal reserves, are important and should be carefully considered before declaring a Coal Reserve.

Geological similarity between neighboring Coal Deposits can greatly simplify demonstration of a new Coal Resource, as well as reduce the technical and economic study requirements needed to demonstrate a Coal Reserve next to an operating mine. Geological similarity should be demonstrated by means of drill holes, mapping, or other deposit-specific geoscientific evidence to a suitable level of confidence required to estimate Measured and/or Indicated Resources. Mere inference of the continuity of coal thickness and quality from an operating mine onto a neighboring block or property is not sufficient to estimate Measured and Indicated Resources and subsequently a Proven and Probable Reserve.

Demonstration of geological similarity or analogy with an operating mine is usually not sufficient to demonstrate technical and economic feasibility. Factors such as geographical access to the deposit and permitting constraints are likely to be project specific. It is the responsibility of the Competent Person to ascertain that there is sufficient information to demonstrate geological similarity and to determine which Modifying Factors should be taken

into account to demonstrate technical and economic feasibility with a reasonable level of confidence.

When a Coal Deposit is scheduled to be mined at a date some time in the future, declaration of a Coal Reserve implies reasonable expectation at the time of reporting that the necessary permits could be obtained as needed.

Coal Reserves may be held and reported by mineral property owners or managers for their strategic asset value with the specific intent for future mining by themselves or others.

66. Coal Reserves should be reported as saleable product (washed coal) in addition to run-of-mine coal, or as run-of-mine coal where this is the saleable product.

For Coal Deposits, it is common practice to report a saleable product rather than the "as mined" product, which is traditionally regarded as the Mineral Reserve for most minerals. It is important that a clarifying statement is included to ensure that the reader is fully informed as to what is being reported and the reference point at which the sale occurs. Some Coal Deposits may be capable of yielding products suitable for more than one application and/or specification. If considered material by the Company, such multiple products should be quantified and reported.

67. Subject to obligations imposed by applicable securities or other laws, Public Reports on coal may not be required to disclose commodity prices used in estimating Mineral Resources or Mineral Reserves for the reasons stated in Clause 57 above.

Coal is sold in a highly competitive national and international market. A credible market entry strategy should be part of coal price assumptions, and market analysis on price, quantities, and quality of product should support Coal Resource and Coal Reserve statements. Price disclosure can be viewed as price signaling and interpreted as anticompetitive. For business and legal reasons, public disclosure of price assumptions made when estimating Coal Resources and Coal Reserves may be detrimental to the interest of the Company. Other requirements concerning pricing which are included in the SME Guide are applicable to coal. This includes the requirement that prices should be based on forward-looking estimates reflecting the Company's reasonable short- and long-term expectations, and that support for such prices be documented.

Exploration Information, Mineral Resources and Mineral Reserves for Industrial Minerals

68. Industrial minerals, including stone and aggregates, are sold as mineral products that should meet customer specifications and volume demands. As a result, establishing the market for mineral products becomes the first step in evaluating an industrial mineral property. Customer physical and chemical specifications should be met for most industrial minerals. Specialty clays, fillers, and extenders may require additional health and safety testing, plant trials, and consumer marketing tests. Such factors as quality and marketability are therefore very important and should be carefully considered before declaring Mineral Reserves. Unless otherwise stated, Clauses 1 to 62 above in the SME Guide (including Figure 1 and Tables 1 and 2)

apply to Exploration Information, Mineral Resources, and Mineral Reserves for industrial minerals. The Competent Person should determine which evaluation criteria in Table 1 of the SME Guide are applicable, which additional evaluation criteria should be taken into account if any, and the materiality of such criteria.

> *When reporting Exploration Information or Mineral Resource and Mineral Reserve estimates for industrial minerals, the key principles and purpose of the SME Guide apply and should be borne in mind. Chemical analyses may not always be relevant, and other physical and chemical quality criteria may be more applicable (e.g., volume percent mineral). If criteria such as deleterious minerals or physical properties are of more relevance than the composition of the bulk mineral itself, then they should be reported accordingly.*
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> *The factors underpinning the estimation of Mineral Resources and Mineral Reserves for industrial minerals are the same as those for other deposit types covered by the SME Guide. It may be necessary, in preparing to report a Mineral Resource or Mineral Reserve, to take particular account of certain key characteristics or qualities such as likely product specifications, proximity to markets, and present access to market or ability to obtain access to market. Material aspects should be discussed in the Public Report. The market for industrial minerals and specialty metals frequently has supply and demand in a tight balance, and there are significant barriers to market entry. Reliability of continuous supply and quality is of as much if not more importance to the buyer as price. A credible market entry strategy should be part of any commodity price assumptions for Mineral Resources, and expressions of interest or commitments from prospective buyers on price, quantities, and quality of product should support Mineral Reserve statements.*
>
> *For some industrial minerals, it is common practice to report the saleable product rather than the "as-mined" product, which is traditionally regarded as the Mineral Reserve for base and precious metals and other minerals. It is important that, in all situations where the saleable product is reported, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.*
>
> *Some industrial Mineral Deposits may be capable of yielding products suitable for more than one application and/or specification. If considered material by the Company, such multiple products should be quantified either separately or as a percentage of the bulk deposit.*

69. With respect to industrial minerals, stone and aggregate, the Modifying Factors may be significantly more critical than geoscientific knowledge in determining Mineral Reserves. Such factors as quality, transportation, cost to markets, location and quality of competing deposits, and ability to compete with such deposits to access the market, are important and should be carefully considered before declaring Mineral Resources and Mineral Reserves.

70. As a general rule, a Mineral Reserve cannot be estimated unless there are reasonable expectations that all permits, ancillary rights, and authorizations required for mining can be obtained and a viable market identified. For some industrial minerals, such as sand, gravel, and aggregates, permitting requirements may be such that reasonable expectations can only be defined by comparison with competing Mineral Reserves. When a deposit is scheduled to be mined in the future, declaration of a Mineral Reserve implies reasonable expectation at the time of reporting that the necessary markets and permits could be obtained when needed.

71. Subject to obligations imposed by applicable securities or other laws, Public Reports on industrial minerals may not be required to disclose commodity prices used in estimating Mineral Resources or Mineral Reserves for the reasons stated in Clause 57 above of the SME Guide.

Some industrial minerals are sold in a highly competitive local, national, and/or international market. For business and legal reasons, disclosure of price assumptions may be detrimental to the interest of shareholders and may not be advisable. Other requirements concerning pricing included in the SME Guide are applicable to industrial minerals, including the requirement that prices be based on forward-looking estimates reflecting the Company's reasonable and supportable short- and long-term expectations, and that support for such prices be documented. Even when commodity prices are excluded, a description of the methodology used to determine prices should be disclosed.

For Industrial Minerals properties producing more than one product, a combined product revenue stream should be used for economic evaluation.

Exploration Information, Mineral Resources and Mineral Reserves for Diamonds

72. Unless otherwise stated, Clauses 1 to 62 above of the SME Guide (including Figure 1) apply. Table 1 of the SME Guide, as part of the guidelines, should be considered when reporting Exploration Information, Mineral Resources, and Mineral Reserves for diamonds. Diamond deposits can be subdivided into (i) igneous-hosted deposits, (ii) marine and alluvial placers, and (iii) tailings and stockpiles. A combination of the particulate nature of diamonds and generally low-grade nature of diamond deposits present specific problems in sampling, estimation, and development of such deposits, which are discussed in the following sections and in Article L of Table 1 of the SME Guide. The points discussed in the guidelines are not equally applicable to primary and secondary diamond deposits. For example, the use of micro-diamonds for grade estimation is not relevant in the placer environment. The Competent Person should determine which evaluation criteria in Table 1 of the SME Guide are applicable, which additional evaluation criteria should be taken into account, if any, and the materiality of such criteria.

For the purposes of Public Reports, the requirements for diamonds have some similarity to those of other commodities with the replacement of terms such as "mineral" by "diamond". The term grade refers specifically to diamond content and should always be quoted in conjunction with a final (tertiary) crushing top size or re-crush size expressed in millimeters (mm square mesh) and a bottom cut-off for diamond size expressed in millimeters (mm square mesh) or equivalent diamond sieve. Information on diamond price (related to color, shape, clarity, and size) should be quoted in conjunction with grade estimates at the same re-crushing size and bottom cut-off. A grade estimate may be disclosed in early stage sampling using macro-diamond estimation to give a global estimate of grade before an estimate of diamond price value can be made. The term "price" is preferred to "value" as it connotes price per carat or per stone. The term "value" has also been used in this context, but may also be used to denote the monetary value of a parcel taken as a whole.

Micro-diamonds typically are less than 1 mm in size and are recovered by total liberation methods applied to small samples only. Total liberation generally refers to acidization or caustic fusion of samples for micro-diamond recovery. Micro-diamond grade estimation may be used to support macro-diamond estimation once a robust micro- to macro-diamond relationship has been established.

Diamond grade is generally quoted in carats per tonne (cpt), carats per hundred tonnes (cpht); or in the case of offshore and some onshore alluvial deposits, carats per cubic meter (m^3), or the term "planar grade" in carats per square meter (m^2) may be used.

As used in the SME Guide, diamond price represents the estimated producer's selling price in U.S. dollars per carat at a specified time for a parcel of diamonds from a particular locality or geological unit(s), or (if the associated diamond parcel has spatial representivity) for the whole deposit.

The term "quality" should not be substituted for "grade", since in diamond deposits these terms have distinctly separate meanings. Mineral chemistry does not provide direct grade or diamond price information, and shall not be used to infer these parameters for Diamond Resource estimation purposes.

73. For Public Reports dealing with diamonds it is a requirement that any reported valuation of a parcel of diamonds be accompanied by a statement verifying the source of the valuation and that the accompanying price estimate is based on a report from a demonstrably reputable and qualified specialist (diamond valuer), with beyond the usual experience of a Competent Person. The timing of the valuation should be stated, and it should be clearly stated whether the reported estimated price is actual or modeled and, in the latter case, how the modeling was carried out and by whom. Also, it should be stated whether the valuer generating the price estimate is linked to any sales or marketing initiatives associated with this same diamond parcel or future diamond production from the deposit. Reports of diamonds recovered from sampling programs should provide material information relating to the basis on which the sample was taken and the method of recovery of the diamonds. The valuation of diamonds should state the final re-crushing top size and the bottom cut-off of the diamond recovery process, and if the diamond price includes all categories of diamonds recovered above a bottom cut-off. The bottom cut-off should coincide with that used to disclose the diamond grade. Prices should not be reported for parcels of micro-diamonds.

There may be cases where valuation of macro-diamonds recovered from total liberation processes may be useful to the Competent Person and may have been used in the estimation of a modeled diamond price. If such valuations were to be disclosed, then this disclosure should be done in the correct context and carefully qualified so as not to be misleading.

In order to demonstrate that a Diamond Resource has reasonable prospects for eventual economic extraction, some appreciation of the likely stone-size frequency distribution and size-price distribution is necessary, however preliminary.

The stone size distribution and price of diamonds per sieve-size class are critical components in the estimation of the "run-of-mine" (ROM) diamond price. At an early exploration stage, sampling and delineation drilling usually will not provide the required information on

diamond price, which may rely initially on large diameter drilling. As a project moves beyond the conceptual stage, conventional bulk sampling such as pitting, trenching, or exploratory underground development may be done. It is recognized, however, that even bulk sampling will likely not recover sufficient diamonds to establish a representative diamond price, and modeling will still be required.

Ideally the valuation parcel should be representative of size, shape, quality, and color assortment of the diamonds in each geological unit of the Diamond Resource. This representivity is rarely achieved, and in most instances the diamond price used in a resource estimate is a "modeled price" that should be derived by a specialist. The specialist should provide evidence to demonstrate the geological representivity of the price underpinning the diamond parcel by for example, stating the proportion of carats attributed to each geological unit in the resource and in the parcel being valued or modeled.

It is also important to qualify whether a parcel for which the price is to be publicized, is "run-of-mine," if any categories of diamonds have been removed from the parcel, or if the parcel has been separated into different categories e.g., gem, near-gem, industrial or by "selling mix," prior to valuation.

74. Where Diamond Resource or Diamond Reserve grades are based on correlations between the frequency of occurrence of micro-diamonds and of commercial-size stones (macro-diamonds), this should be stated, the reliability of the procedure should be explained, and the bottom cut-off sieve-size for micro-diamonds reported. Details of the laboratory facilities used for the processing of samples and the method for recovery of micro-diamonds should also be disclosed.

Diamond grade estimation using micro-diamond sampling would not be sufficient to estimate a Diamond Resource unless sufficient macro-diamonds were recovered to enable a robust estimate of diamond price and size frequency distribution. However, in the case of a producing mine or advanced development property, where Diamond Resources have been estimated and sufficient macro-diamonds have been recovered to allow estimation of diamond price, and a preliminary size-frequency distribution can be modeled, it is permissible to extrapolate diamond prices and size-frequency distribution if geological homogeneity and continuity can be demonstrated. The Competent Person should comment on the adequacy of the quantity of recovered macro-diamonds to estimate diamond price and an indication of the uncertainty in the price estimate.

Key issues in the micro- to macro-diamond grade modeling approach are the use of appropriate sampling protocols to ensure that dilution in the sample is sufficiently understood. The relationship between the micro- and macro-diamond portions of the total content curve (in situ size-frequency distribution) is critically affected by country rock dilution, diamond liberation, and diamond damage. The relative diamond recovery efficiencies of the sampling and subsequent mining and processing technologies should be addressed.

It is also important to understand that the diamond price and size-frequency distribution may change as additional diamonds are recovered from further sampling, increasing the size (weight) of the parcel used to estimate the price and size-frequency distribution.

75. Diamond sampling does not provide a "total" assay as with many other mineral commodities. Conventional macro-diamond sample processing will not liberate or recover all the contained diamonds, and micro-diamond sample processing only reports diamonds above a cut-off size that varies between laboratories. The relative efficiencies of micro-diamond sampling and full-scale treatment and recovery technologies should be considered, through granulometry and ore dressing studies, to derive appropriate Modifying Factors for the conversion of Diamond Resources into Diamond Reserves.

> *In the case of marine placers, it is common practice, during the conversion of Diamond Resources to Diamond Reserves, to apply mining recovery factors (based on the comparison of realized grades to estimated grades for the types and combination of sampling and mining tools used, and for the type of footwall present in the mined area). Mining recovery factors are also applied for kimberlite deposits and may vary by pipe and/or lithology.*

76. Diamond Resource classification is based on Clauses 35 to 40 above and on the following diamond-specific criteria:

> *An Inferred Diamond Resource would be estimated when the diamond parcel (the recovered stones from samples) is considered by the Competent Person to be too small to be a reasonable representation of the full diamond assortment. Global grade and price estimates may be permissible if supported by adjacent Indicated Diamond Resources.*
>
> *An Indicated Diamond Resource would be estimated when sufficient diamonds have been recovered so that the shape, physical characteristics, grade, and diamond value can be estimated with a reasonable level of confidence.*
>
> *A Measured Diamond Resource would be estimated when sufficient diamonds have been recovered so that the shape, physical characteristics, grade, and diamond price can be estimated with a high level of confidence. As a result of the complexity of Diamond Resource estimation, diamond deposits are rarely classified as Measured Resources (or Proven Reserves). Sampling and estimation of diamond deposits is particularly difficult and expensive, and thus even the assignment of Indicated status may prove difficult.*

Exploration Information for In Situ Recovery (ISR), ISR Resources and ISR Reserves

77. In Situ Recovery ("ISR") involves the circulation of native groundwater, sometimes fortified with oxidizing and complexing agents, through a sub-surface mineralized zone. This mining solution, called lixiviant, is pumped into injection wells, through the mineralized zone, where the mineralization is solubilized; and recovered through extraction wells. This mineral-bearing solution proceeds to a surface processing facility for metal or mineral removal and is then re-fortified, pumped back into the wellfield and re-circulated through the mineralized zone. This re-circulation of lixiviant continues until the mineralized zone is depleted. However, unless otherwise stated, Clauses 1 to 61 above in the SME Guide (including Figure 1 and Tables 1 and 2) apply to Exploration Information, Mineral Resources, and Mineral Reserves for ISR deposits.

Because of ISR-specific characteristics—including (i) hydraulic parameters related to location of the Mineral Deposit within the saturated environment, (ii) hydraulic isolation (confinement) of the mineralization, (iii) permeability of the mineralized interval, and (iv) amenability of the mineralization to lixiviant—the most significant requirements which must be satisfied before an ISR Resource or an ISR Reserve is estimated are not necessarily the same for ISR as they are for other minerals.

78. The terms "Mineral Resource" and "Mineral Reserve", and the subdivisions of these terms as illustrated on Figure 1 of the SME Guide, apply also to ISR reporting, but the Company may, in its discretion, elect to substitute the terms "ISR Resource" and "ISR Reserve" along with the appropriate class subdivisions. In both cases the reference point (in situ, saleable, etc.) should be stated.

79. ISR Resources are intended to be sufficiently defined that their overall tonnages, grades, and mineral contents can be estimated and reported with a reasonable level of confidence.

When reporting information and estimates for ISR deposits, the key principles and purpose of the SME Guide apply and should be borne in mind. The requirements for ISR deposits are generally similar to those for other commodities. However, in some ISR deposits it is common practice in the estimation of ISR Resources and Reserves to use a grade times thickness (GT) as a measure of mineralization cut-off value. This method is based on the product of mineralization grade and true thickness, indicated for each major intercept within the mineralized horizons. Contouring of posted GT values derived from drill holes is commonly used in the uranium ISR industry. ISR Resource estimates may be stated as contained mineral with accompanying percent grade. Some deposits state tonnages while others do not, as no rock is moved in ISR operations, only solutions. ISR Reserve estimates may be stated as recoverable mineral with accompanying percent grade.

80. As for all minerals, it is the responsibility of the Competent Person to determine, in each particular situation, which specific requirement must be satisfied before an ISR Resource or an ISR Reserve can be declared. The Competent Person should determine which evaluation criteria in Table 1 of the SME Guide are applicable, which additional evaluation criteria should be taken into account if any, and the relevance of such criteria.

Many criteria listed in Table 1 of the SME Guide which may be critical to the evaluation of other Mineral Deposits, will not apply to the evaluation of ISR deposits. Such criteria as project-specific hydraulic parameters (transmissivity, hydraulic conductivity), geochemical variability, solubility, sweep factors, leachability, refractory nature of mineralization, and costs associated with producing and restoring from multiple horizons, are important and should be carefully considered before estimating an ISR Resource or ISR Reserve.

Geological similarity between neighboring ISR deposits can be useful in the estimation of new ISR Resources. Geological similarity must be demonstrated by means of drill hole logging, mapping, or other deposit-specific geoscientific evidence to a suitable level of geoscientific confidence and knowledge required to estimate ISR Resources. Mere inference of the continuity of a known mineralized trend from an operating mine onto a neighboring block or property is not sufficient evidence to estimate ISR Resources.

Data resulting from development drilling, onsite aquifer testing to demonstrate confinement of the mineralized zone, and hydraulic communication coupled with dissolution or leach studies generally provide enough technical information to support production. Unless the project is located in a completely new geological province, ISR projects may rely on pilot wellfields or a neighboring project in the same formation and may not need to incur the expenses of producing either a Pre-Feasibility or Feasibility report prior to production. It is the responsibility of the Competent Person to ascertain that there is sufficient information to demonstrate geological similarity and to determine which Modifying Factors must be taken into account to demonstrate technical and economic feasibility with a reasonable level of confidence.

TABLE 1. Checklist of Assessment Criteria

The purpose of this table is to provide a checklist to assist the Competent Person in addressing all material aspects of a project. It is the responsibility of the Competent Person to determine which criteria listed below and which additional criteria should apply to the study of a particular project.[2] The relative importance of the criteria will vary with the particular project and the technical, economic and legal conditions pertaining at the time of determination.

Evaluation of mineral projects involves judgment predicated on knowledge and experience. Mineral Resource and Mineral Reserve estimates are more than arbitrary determinations; they seek to attach confidence as a consequence of method and the data. The methods employed must be valid, tested, use accepted definitions of terms and procedures, and best suited to the making of reliable estimates for the project in question. Evaluation of mineral projects requires periodic examination and analysis of all new and existing data. The dynamic nature of the valuation of mineral projects implies that a valid estimate made at a given time may be significantly changed when new information becomes available.

Evaluation and supporting documentation should consider all the criteria listed below and such additional criteria that may be viewed as significant. Items that are not addressed should be accompanied by an explanation in the documentation as to why they have been excluded or that the work is incomplete. Publicly reported information must be sufficient to make a reasonable and balanced assessment of the significance of this information. When and whether information should be released publicly is subject to current laws and regulations in the relevant jurisdictions.

[2] The assessment criteria for Mineral Resources would normally apply to Scoping Studies; the assessment criteria for Mineral Reserves for planned operations would normally apply to Pre-Feasibility and Feasibility Studies, or, in the case of operating mines, the assessment criteria for Mineral Reserves would normally apply to life-of-mine plans at Pre-Feasibility or Feasibility Study level.

In some cases, it will be appropriate for a Public Report to exclude some commercially-sensitive information. A decision to exclude commercially-sensitive information would be a decision for the Company issuing the Public Report, and such a decision should be made in accordance with any relevant regulations in that jurisdiction. Such information could include Exploration Information, markets, product specifications, contract terms, commodity prices, and costs. In cases where commercially-sensitive information is excluded from a Public Report, the Public Report should provide summary information (for example, the methodology used to determine economic assumptions where the numerical value of those assumptions is commercially sensitive).

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
A. General			
1. Purpose of report	• Statement of Company for whom the report was prepared, whether it was intended as a full or partial evaluation, what work was conducted, what work remains to be done. • Name of Report author and relationship of the author to the Company.	• See Exploration Information.	• See Exploration Information.
2. Project Description	• Description of commodity, magnitude of project, background, and business arrangement.	• See Exploration Information.	• See Exploration Information.
3. Project Location	• Description of location (country, state or province, county, latitude and longitude, etc.). • A map showing location and access should exist.	• See Exploration Information.	• See Exploration Information.
4. Property Ownership	• Description of ownership of mineral rights, surface rights, access rights, leases, concessions, royalties, agreements, and other encumbrances and liabilities. • Nature of Company's existing rights or those still to be obtained to prospect or mine, plus any obligations to earn those rights and time limits. • Disclosure of back-in agreements or rights and, to the extent known, historic or current	• See Exploration Information.	• See Exploration Information.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
	environmental liabilities. • Discussion of relevant adjacent properties.		
5. Accessibility, Climate, Local Resources, Infrastructure, and Physiography	• Topography, elevation, and flora and fauna. • Means to access the property. • Proximity of project to population centers and restricted use areas. • Climate and length of operating season. • Sufficiency of surface rights for mining and processing. • Availability and sources of power, water, mining personnel, potential tailings and waste storage areas, heap leach and processing plant sites.	• See Exploration Information.	• See Exploration Information.
6. Project History	• Description of prior ownership and ownership changes. • Exploration and/or production history. • Significant historical Mineral Resource and Mineral Reserve estimates.	• See Exploration Information.	• See Exploration Information. • Comparison of historical production performance statistics to current and planned operations, including the reliability of these and how they relate to the current estimates.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
7. Site Visits	• Comment on any site visits and dates undertaken by the Competent Person(s) and outcome of those visits. • Reviews of surface sampling, geophysics, and mapping programs. • If no visits were undertaken, state why.	• Comment on site visits and dates undertaken by the Competent Person(s) and outcome of those visits. • Visits during major drilling programs and metallurgical sample selection. • Review logging, sampling, drill hole locations.	• See Mineral Resource. • Multiple visits during Pre-Feasibility and Feasibility Studies to view aspects of infrastructure layout sites, road access, stakeholder meetings. • Multiple visits (at least annual) during development of life-of-mine plans to review current and planned operations.
8. Units of Measure	• Units of measure, currency, and relevant exchange rates used should be stated.	• See Exploration Information.	• See Exploration Information.
B. Project Data			
1. Location	• Maps and cross sections and other two- or three-dimensional representation of results should exist, showing location of samples, drill holes, exploration pits, underground workings, geological data, etc. • When evaluating drill hole results, consideration should be given to depth to top and bottom of mineralization, to total length and grade of intercepts, and to the accuracy of survey information including down-hole surveys.	• See Exploration Information. • Particular attention should be given to drill-hole and other sample survey information including down-hole surveys. • If the sample locations are not well known, the effect on the resource estimates should be considered. • The location of drill-hole collars should be accurate, and the adequacy of the down-hole surveying technique should be reviewed and commented on. • If more than one coordinate system is in use on the project, the relationship between the systems needs to be established and verified. • Changes in magnetic declination with time should be accounted for and documented. Effects of vertical and	• See Mineral Resource. • The location of samples and other relevant features (property lines, mine workings, etc.) should be well-known.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
		horizontal components of the magnetic field and magnetic storms on magnetic declination at high latitudes should be considered.	
2. Geology	• Description of the nature and reliability of geological information (rock types, structure, alteration, mineralization, and relation to known mineralized zones, etc.). • Description of the deposit type and physical continuity of mineralization. • Description of drill-hole logging and mapping procedures. • Description of geophysical and geochemical data, including dimension, type, results, and implications. • Reliable geological maps and cross sections of appropriate scales should exist to support interpretations. • Preliminary assessments or observations of geotechnical and hydro-geological conditions that can impact mining and processing assumptions.	• See Exploration Information. • Particular attention should be given to drill-hole logging and other sample information used in resource evaluation. • A description of the thoroughness with which all significant lithologic, stratigraphic, structural, mineralogical, alteration, or other geological or geotechnical characteristics were recorded. • Significant data, or data that could materially influence the estimated quantity and quality of the resource, should be discussed.	• See Mineral Resource.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
3. Topography	• General topographic map is sufficient.	• Topographic map in sufficient detail to support mine planning and conceptual infrastructure layout.	• Detailed topographic map. • Aerial surveys must be checked with ground controls and surveys, particularly in areas of rugged terrain, dense vegetation, or high altitude.
4. Sampling			
a. Method	• Description of sample type and sample collection method (hand, grab, trench, channel, or chip sample; core hole, rotary hole, or reverse circulation; bulk sample, etc.). • Discussion of sample quality, size, and representativeness (sample recovery, high grading, selective losses or contamination, and any other factors that may have resulted in sample biases, etc.). • QA/QC procedures adopted for sample collection including core cutting and splitting as required and should be implemented early in exploration of a mineral prospect. • Discussion of whether duplicate samples or alternative methods of sampling were used to verify sample quality. • Description of indirect methods of measurement (geophysical methods), with attention given to potential or actual errors or biases in interpretation.	• See Exploration Information. • The quantity and quality of sample information is critical to the reliability of resource estimates and should be documented. • Particular attention should be given to this information.	• See Mineral Resource.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
b. Preparation	• Description of laboratory and method used for sample preparation, sub-sampling and size reduction, and likelihood of inadequate or non-representative samples (improper size reduction, contamination, etc.). • Discussion of whether tests were performed to verify the suitability of sample preparation and the magnitude of sample preparation error.	• See Exploration Information. • Verification of the suitability of sample preparation is required.	• See Mineral Resource.
c. Analysis	• Identification of laboratory and analytical method (fire assay, AA assay, emission spectroscopy, etc.). • Discussion of relevance of laboratory accreditation, precision, and accuracy, including the use of quality control programs (blanks, duplicates, certified or standard reference materials), and submission of samples to other laboratories for verification. • Collection of baseline trace element, whole-rock analyses, and evaluation for possible deleterious elements.	• See Exploration Information. • Verification of analytical techniques and quality control programs are required. • Check sampling and assaying must have been performed by independent laboratories. • Quantitative evaluation of QA/QC data. • Assaying of all payable and penalty elements; physical tests as required by product specifications. • Discussion of methods used to detect the presence of deleterious elements or minerals that will affect mining, processing, environmental programs, or worker safety.	• See Mineral Resource.
d. Sample Verification	• Collection of independent samples (witness samples) under the supervision of the Competent Person.	• See Exploration Information.	• See Exploration Information.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
	• Can include channel samples, twin holes, visual inspection, resampling split core, etc.		
e. Bulk Density	• Generally based on preliminary test work or benchmarking.	• Discussion of how the bulk density was determined (assumed, measured, or estimated). • If assumed, which assumptions were made and on which basis. • If measured, by what method and how abundant and representative are the bulk density data. • If estimated, what methodology was used to estimate the density. • Discussion of whether different bulk densities were used in different parts of the deposit and why. • Bulk density should be stated as on a dry or wet basis.	• See Mineral Resource. • The bulk density must account for void spaces (vugs, porosity, etc.) and for differences between rock types, structural and alteration zones within the deposit. • Waste bulk densities should be well defined.
f. Sample Security	• Measures taken to ensure sample security and chain of custody should be documented. • Retention of sample rejects, pulps, and remaining core.	• See Exploration Information.	• See Exploration Information.
g. Database Management	• Measures taken to ensure data have not been corrupted by, for example, transcription or keying errors. QA/QC and data validation procedures used. • Security of project data (backups). Protocols for changing data in database.	• See Exploration Information. • Methods used to verify primary data and to validate the database should be described. • Checks on integrity of previous entries in database when new information is added.	• See Mineral Resource.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
C. Interpretation			
1. Geological Interpretation and Model	• Description of genetic model and inferences made from this model. • Discussion of adequacy of data density and reliability, and whether the quality and quantity of information are sufficient to support statements made or inferred concerning potential for significant economic discovery. • Orientation of drill holes and other samples in relation to the geological structures and mineralization to ensure unbiased interpretation of true widths. • If true widths are unknown, there should be a clear statement to this effect.	• See Exploration Information. • Discussion of sufficiency of data density to assure continuity of mineralization, geological boundaries, and provide an adequate database for the estimation procedure used. • Discussion of the extent to which the interpretation is based on data or on assumptions and whether consideration was given to alternative interpretations or models. • Geologic models of key attributes (e.g., lithology, structure, alteration, stratigraphy).	• See Mineral Resource.
2. Resource Model	• Not required, but preliminary model may exist to assist in quantification of potential tonnage and grade ranges. • Weight averaging techniques, grade capping, and cut-off grades. • Assumptions used for any reporting of metal equivalent values. • If possible, establish Exploration Target ranges for grades and tonnages.	• Detailed description of the method and reasons used, and the assumptions made, to estimate tonnages and grades (section, polygon, inverse distance, geostatistical, or other method). • Description of how the geological interpretation was used to develop domains and control the resource estimates. • Discussion of basis for using, or not using, grade cutting or capping, or restriction of the volume of influence. • Compositing or data aggregation methods used should be described.	• See Mineral Resource.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
		• If a computer method was chosen, description of programs and parameters used. • Geostatistical methods are extremely varied and should be described in detail. • The method chosen should be supported. • The geostatistical parameters, including the variogram, and their compatibility with the geological interpretation should be discussed. • Experience gained in applying geostatistics to similar deposits should be taken into account. • Description of methods used to verify and validate models. • Assumptions used for any reporting of net smelter returns or metal equivalent values.	
D. Resource and Reserve Classification			
1. Criteria	• Not applicable.	• Description and justification of criteria used to classify the resource, including relationship to cut-off grade assumptions. • To classify a resource as Measured or Indicated, there must be a reasonably high level of confidence with respect to the quality of the information used to estimate this resource, as well as the interpretation of this information. • Exploration Targets must be excluded from economic evaluations.	• Description and justification of criteria used to classify the reserves, and confirmation of resource classification assumptions with respect to cut-off grades used in the production schedule. • Description of all Modifying Factors used to demonstrate economic viability of Measured and Indicated Mineral Resources to support declaration of a Mineral Reserve. • Exploration Targets and Inferred

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
		• If Inferred Mineral Resources are used in economic evaluations, this should be disclosed. • Reconciliation with previous Mineral Resource estimates. • A conceptual analysis to justify reasonable prospects for eventual economic extraction	Mineral Resources must be excluded from demonstration of economic viability to support declaration of a Mineral Reserve. • Discussion of the level of confidence in the Modifying Factors. • Uncertainty in Modifying factors may reduce conversion of all or part of the Measured Mineral Resources to a Probable Mineral Reserve. • Reconciliation with previous Reserve estimates.
2. Risks and Opportunities	• Opportunity expressed as Exploration Target ranges of tonnages and grades.	• Discussion of uncertainty of geological boundary assumptions and their risk and opportunity for overall Mineral Resource estimates. • Address uncertainties on the tonnage and grade of production increments. • Determine work programs to upgrade classification or increase resources.	• Determine work programs to upgrade Probable Mineral Reserves to Proven Mineral Reserves.
E. Extraction			
1. Mining			
a. Method	• Description of any Modifying Factors that could have a significant impact on the project viability.	• See Exploration Information. • Discussion of mining method to be used, and selective mining criteria assumed that supports the estimated resource. • Discussion of the dilution implicit in the resource model.	• Mining method(s), mine plans and production schedules defined for the life of the project. • Description and justification of mining method(s) to be used. • Discussion of mining rate, equipment selected, ore control methods, geotechnical and hydrogeological considerations, staffing requirements, health and safety of the workforce, dilution, and recovery.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
			• For surface mines, discussion of pit slopes, slope stability, and strip ratio. • For underground mines, discussion of mining method, rock mechanics considerations, mine design characteristics, and ventilation/cooling requirements. • For in situ recovery or solution mining, discussion of the extraction process, solution grades, host rock chemistry and reaction with solvents, permeability, and porosity. • Consideration of waste rock issues related to impacts on surface and ground water systems.
b. Costs	• Generally not determined.	• State basis for assumptions. • Currency, exchange rates and dates of estimates. See Table 2 of the SME Guide.	• Description and justification of capital and operating costs. • All capital items identified. • Detailed equipment list. • Price quotes for all major equipment items. • Major components of operating costs itemized and supported by functions and elements. • Capital (including sustaining) and operating budgets defined by year. • See Table 2 of the SME Guide.
2. Processing			
a. Method	• Description of any factors that could have a significant impact on mineral processing and/or the project viability.	• See Exploration Information. • Discussion of possible processing methods and any processing or metallurgical test work completed. • A full definition of the minerals, or at	• Description and justification of processing method(s) to be used, equipment, plant capacity, and personnel requirements. • State whether the process method

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
		least the assays, to ensure that the process is suitable and that any contaminants/pollutants/possible by-products are recognized, and suitable process steps have been included in the flow sheet. • Description, to the extent known, of the degree to which the test samples are representative of the various types and styles of mineralization and the Mineral Deposit as a whole. • Composite samples are adequate at this stage of metallurgical testing, although an assessment of the variability is desirable if there is significant variation in test results. • Discussion of whether the process method is widely used and if uncommon or novel, then describe the risks and test work designed to mitigate the risk.	selected is well-tested or new technology. • Detailed flow sheet and mass balance based on comprehensive metallurgical program. • Justification of estimated recovery (proportion of material sent to the processing plant that will be recovered) by geologic zone, whether based on historical operating data from the same property, laboratory tests, or pilot plant results. • Variability samples should be used to conduct metallurgical tests in order to understand changes in processing parameters and results that will be encountered over the life of the mine. • Assumptions or allowances made for deleterious elements or variability in the ore feed to the process. • Known environmental and health and safety risks associated with the flow sheet, with those sections dealing with hazardous materials or operations covered in more detail. • For mineral products that are defined by specification, discussion of the basis for the reserve estimate in accordance with the appropriate mineralogy, testing, and processing requirements to meet the specification.
b. Costs	• Generally not determined.	• State basis for assumptions, taking	• Description and justification of capital

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
		into account processing method on extraction design and rock/mineralogical character.	and operating costs. • All capital items identified. • Detailed major equipment list. • Price quotes for all major equipment items. • Major components of operating costs by functions and elements itemized and supported. • Capital and operating budgets defined by year. • See Table 2 of the SME Guide.
3. Recovery			
a. Mining	• Generally not determined.	• State typical dilution and mining recovery for the selected or proposed mining method.	• Reported tonnages, grades and mineral contents must take into account mining dilution and mining recovery. • Description and justification of mining dilution and mining recovery is required.
b. Processing	• Generally not determined.	• Provide insight gained from preliminary testing and insight into differences between laboratory and commercial scales.	• Discussion of whether the reported tonnages and grades consist of material in place or whether processing recoveries are included. • If in-place metal or quantity are reported, information must be supplied concerning expected processing losses or recoveries. • Justification of processing recoveries is required.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
4. Cut-off Grade	• Typically reported in terms of minimum true thickness and cut-off grade criteria.	• Justification of the cut-off grade used to report resources including but not limited to assumptions made for costs, prices, recoveries, by-product credits if based on revenue, net smelter return.	• Description of methods used to calculate cut-off grades, including but not limited to costs, prices, recoveries, and by-product credits if based on revenue, net smelter return.
F. Supporting Infrastructure and General and Administrative			
1. Facilities	• See A.5 (Accessibility, Climate, Local Resources, Infrastructure, and Physiography).	• See A.5 (Accessibility, Climate, Local Resources, Infrastructure, and Physiography). • It is reasonable to assume that necessary facilities could be built or accessed.	• Necessary facilities have been designed (which may include processing plant, tailings dam, leaching facilities, waste dumps, road and/or rail accesses, ports, power supply, pipelines, offices, housing, security, etc.). • Detailed map showing location of facilities. • Construction schedule developed.
2. Staffing	• See A.5 (Accessibility, Climate, Local Resources, Infrastructure, and Physiography). • Safety plan. • Emergency evacuation plan.	• See A.5 (Accessibility, Climate, Local Resources, Infrastructure, and Physiography). • Safety plan. • Emergency evacuation plan.	• Detailed staffing plan. • Training. • Salary scale. • Work schedule. • Operating days. • Safety plan. • Emergency evacuation plan.
3. Supplies	• Generally not determined.	• Reasonable assumption that necessary supplies can be obtained.	• Necessary supplies have been identified (electricity, reagents, fuels, etc.). • Demonstration that supplies are available as needed.
4. Water Considerations	• Preliminary investigations to support exploration activities.	• Stated reasonable assumptions.	• Water quantity and quality requirements specified and sources of water identified.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
			• Dewatering requirements estimated on the basis of hydrologic and climatic studies. • Water treatment and disposal, water balance and management, and quality control plans in place.
5. Costs	• Generally not determined.	• Stated reasonable assumptions.	• Description and justification of capital and operating costs. • All capital items identified with sufficient detail for costing. • Construction schedule and capital and operating budgets defined by year.
G. Environmental Compliance and Reclamation			
	• Description of environmental factors likely to prohibit the project proceeding, including contaminants in material to be disturbed and deleterious elements likely to occur in products.	• Description of environmental factors that could have a significant impact on the project feasibility and possible means of mitigation. • Progress of environmental, cultural, and archeological baseline studies.	• The necessary permits have been obtained, or there is reasonable basis to believe that all permits required for the project can be obtained in a timely manner. • Description of yearly environmental compliance methods and costs, including reclamation, bonding, and closure plan and costs.
H. Social License			
	• Preliminary review with stakeholders in exploration and project development areas. • Consideration of "Conflict Minerals" regulations. • Sustainable development to support exploration. • Formal contact with local inhabitants.	• Discussion of potential social or community related requirements and plans for the project and the status of negotiations or agreements with local communities and other stakeholders. • Consideration of "Conflict Minerals" regulations. • Sustainable development to support advanced project drilling and	• Social management plan and program, and community and other stakeholder related requirements and agreements. • Consideration of "Conflict Minerals" regulations. • Sustainable development to support construction and operation. • Training programs, local vendor

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
		sampling. • Training programs.	development plan. • Evaluation of political risk and mitigation.
I. Economic Viability			
1. Product Value	• Description of valuable and potentially valuable product(s) including suitability of products to market. • For minerals products where a market is needed prior to beginning exploration, a description of the customer specifications, testing, and acceptance requirements.	• See Exploration Information. • Stated reasonable assumptions concerning likely product value. • Potential markets and ability to enter the market. • Penalties likely incurred for contaminants and conversely, by-product credits if estimated in resource model or assumptions made if based on metallurgical test work.	• See Mineral Resource. • Description of product to be sold. • Discussion of whether there exists a market for the product, its impact on that market, and whether contracts for the sale of the product are in place or expected to be obtained. • Demand, supply, and inventories for the particular commodity; consumption trends and factors likely to affect supply and demand in the future, resulting in commodity price profiles. • Demonstration that the price assumptions are reasonable and supportable. • Justification of assumptions made concerning production cost and value of product at sale point. • Transportation, marketing, down-stream processing, and other costs or losses should be considered.
2. Cash Flow Analysis	• Generally not applied.	• Consideration of order of magnitude capital cost, operating costs, and revenue to indicate reasonable prospects of eventual economic extraction.	• Detailed cash flow analysis for the life of the project, including a summary of taxes, royalties, and government levies. • Sensitivity analysis and simulations of risk related to grade, prices, capital costs, and operating costs, and any

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
			additional significant variables. • Discount rate, internal rate of return, payback period and other metrics.
3. Study Accuracies	• Preliminary Studies often applied to justify exploration targets.	• See Table 2 of the SME Guide in reference to Scoping Studies that might be used to support a Mineral Resource statement.	• See Table 2 of the SME Guide in reference to Pre-Feasibility and Feasibility Studies that are used to support a Mineral Reserve statement.
J. Risk and Opportunity Analysis			
	• Generally not applied. • High-level risk and opportunities reviewed.	• Sufficient risk assessment completed to confirm reasonable prospects of eventual economic extraction. • Resource enhancement opportunities.	• Project technical, social, environmental, and economic risk in the form of a risk register describing likelihood of occurrence and cost. • Description of actions which will be taken to mitigate risk. • No known significant risk of project failure. • Future options to enhance project value.
K. Other Considerations and Recommendations			
	• Description of any other significant information that is likely to prevent or facilitate the economic viability of the project. • Identification of work or conditions required to establish a Mineral Resource.	• Description of any other material information that could prevent or facilitate the potential economic viability of the resource. • Identification of work or conditions required to convert the Mineral Resource to a Mineral Reserve. • Known information that significantly reduces or increases the probability of economic feasibility should be reported. • Resource statements should be reviewed annually.	• While any other material information affecting the project should be discussed, no material impediments to the profitable exploitation of the property should remain. • Material uncertainties about the Modifying Factors have been mitigated or eliminated so that a Competent Person, acting reasonably, can determine if all or part of the Mineral Resource may be converted to a Mineral Reserve at the time of reporting.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
			• It is not required that all permits be issued or that mining and processing facilities have been constructed. • However, there should be a reasonable basis to believe that permitting and construction of the necessary facilities can be accomplished in a timely manner. • Reserve statements should be reviewed annually.
L. Diamonds			
1. Exploration	• Reports of collection and analysis of indicator minerals such as chemically/physically distinctive garnet, ilmenite, chrome spinel and chrome diopside which distinguish them as being sourced from potentially diamondiferous rocks should be prepared by a suitably qualified and accredited laboratory.	• See Exploration Information.	• See Exploration Information.
2. Sample Collection	• Type of sample and purpose, e.g., core drilling for micro-diamond sampling and geology, large diameter drilling to establish stones per unit of volume, and grade or bulk samples to establish diamond value. • Sample size, distribution and representivity.	• See Exploration Information.	• See Exploration Information.
3. Sample Treatment	• Type of facility, treatment rate, and accreditation. • Sample size reduction protocol.	• See Exploration Information.	• See Exploration Information.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
	• Bottom screen cut-size, top screen cut-size and re-crush screen cut-size. • Processes (dense media separation, magnetic separation, grease recovery, X-ray sorting, hand-sorting etc.). • Process efficiency, tailings auditing, spike recovery and granulometry analysis. • Sample head feed and tailings particle granulometry. • Percent concentrate and undersize per sample. • Sample density determination. • Laboratory used and type of process for micro diamond recovery (e.g., caustic fusion or acidization).		
4. Sample Grade	• Sample grade in this section of Table 1 is used in the context of carats per units of mass, area, or volume. • The sample grade above the specified lower cut-off sieve size should be reported as carats per dry metric tonne and/or carats per 100 dry metric tonnes. • For placer deposits, sample grades quoted in carats per m^2 or carats per m^3 are acceptable. • In the marine placer environment	• See Exploration Information.	• See Exploration Information.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
	reserve grades are reconciled on a per m^2 basis. Volume estimates are inherently inaccurate and are used primarily to assist with estimating mining rates and costs.		
5. Sample Characteristics	• Micro and macro diamond sample results per facies. • The weight of diamonds should be stated by sieve-sizes. • The lower cut-off size should be stated.	• See Exploration Information. • Bulk sampling results, global sample grade per facies and local block estimates in the case of Indicated and Measured resources. • Spatial structure analysis and grade distribution. • Stone size/weight and size/number distribution. • Effect on sample grade with change in bottom cut-off screen size.	• See Exploration Information. • Adjustments made to diamond size/weight distribution for sample plant performance versus performance on a commercial scale (Diamond Reserve Modifying Factors).
6. Grade Estimation	• Generally not applied.	• Grade estimation (including geostatistical) and interpolation techniques applied. • Adjustments made to diamond size/weight distribution for sample plant performance and performance on a commercial scale.	• See Mineral Resource.
7. Value (Price) Estimation	• Generally not applied.	• Accreditation of valuer and date of valuation. • Details of parcel(s) sorted and valued, number of stones, carats, and size/weight distribution using a standard progression of sieve sizes for each identified facies, geological unit or domain. • Value per sieve size.	• See Mineral Resource.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
		• Estimation (models) of value with size. Assessment of diamond damage (insignificant, moderate, severe). • Value with change in bottom cut-off size. • Estimate of the uncertainty in the value estimate due to parcel size and comment on the spatial representivity of the valuation parcel. • Clarification as to whether a strict bottom cut-off been applied or does the modeled value include incidental diamonds below the bottom cut-off?	
8. Security and Integrity	• Chain of custody. • Site security.	• Accredited process audit. • Whether samples were sealed after excavation. • Valuer location, escort, delivery, cleaning losses, reconciliation with recorded sample carats and number of stones. • Core samples washed prior to treatment for micro diamonds. • Audit samples treated at alternative facility. • Results of tailings checks. • Recovery of tracer monitors used in sampling and treatment. • Geophysical (logged) density and particle density. • Cross validation of sample weights, wet and dry, with borehole volume and density, moisture factor.	• See Mineral Resource.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
9. Classification	• Not applicable.	• Consider the elements of uncertainty in estimates and develop classification accordingly. • Key elements to consider for resource classification are the geology, drill-hole and sample spacing/interval, spatial representivity, and accuracy of estimates of volume, density, grade, diamond value.	• See Mineral Resource.
M. Qualification of Estimator(s)			
1. Qualifications	• Name and qualification of the Competent Person preparing and reviewing the report, and whether the Competent Person is independent with respect to the Company or project that is the subject of the report. • Include description of at least five years' relevant experience in style of mineralization and type of deposit. • Include statement that the Competent Person's RPO has jurisdiction over the Competent Person's actions with regard to the Mineral Deposit being publicly reported and the Competent Person is subject to the code of ethics of the RPO. • Include statement whether the Competent Person is licensed or registered as an engineer or geoscientist in the jurisdiction in	• See Exploration Information.	• See Exploration Information.

Evaluation Criteria	Exploration Information	Mineral Resource	Mineral Reserve
	which the deposit occurs if required by law in that jurisdiction.		
2. Reliance on other specialists	• Reliance on specialists applies in limited circumstances to highly-specialized information such as legal, political, environmental or tax matters that are outside the purview of a Competent Person. • Identification of: - the source of the information relied upon, including the date, title, and author of any report, opinion, or statement, - the extent of reliance, and - the portions of the Public Report to which the reliance applies.	• See Exploration Information.	• See Exploration Information.
N. References			
	• References cited with author, date, title, and source.	• See Exploration Information.	• See Exploration Information.

TABLE 2. Study Accuracy Ranges for Capital and Operating Cost Estimates

Levels of effort required for components of Technical Studies and their attendant accuracy levels have been the subject of considerable debate and difference of opinion within the mining community. The SME Guide has drawn on the Third Edition of the *Mining Engineering Handbook* (2011) to provide standards to be used by the Competent Person in preparing Technical Studies.

As used in the table, "historic" implies information that may be available and still relevant from similar projects. The term "benchmark" could also be interchangeably used if current data from similar projects are used. "Contingency" is an allowance for items not specified in scope that will be needed, or unanticipated changes in costs, as for example adverse foreign exchange consequences. Contingencies are additive to the cost estimates. Where the data on which the estimate basis are limited, contingency may be specified for the entire estimate. Where sufficient data exist, contingency should be set by facility or cost element (typically as a percentage addition), and a summary of all contingencies should be presented as part of the summary of capital and operating cost estimates.

In Technical Studies, the Competent Person should provide the basis for capital and operating cost estimates and an assessment of the level of accuracy for at least the categories listed below. If considered appropriate, the Competent Person may use the AACE International Guide 47R-11 for the Mining and Mineral Processing Industries (as amended) or other internationally-recognized and accepted guidelines.

Capital Cost Category	**Scoping Study**	**Prefeasibility Study**	**Feasibility Study**
Basis of Estimate to include the following areas: Civil/structural, architectural, piping/HVAC, electrical, instrumentation, construction labor, construction labor productivity, material volumes/amounts, material/equipment, pricing, infrastructure	Order-of-magnitude, based on historic data or factoring. Engineering <5% complete.	Estimated from historic factors or percentages and vendor quotes based on material volumes. Engineering at 5 to 15% complete.	Detailed from engineering at 15% to 25% complete, estimated material take-off quantities, and multiple vendor quotations.
Contractors	Included in unit cost or as a percentage of total cost.	Percentage of direct cost by area for contractors; historic for subcontractors.	Written quotes from contractor and subcontractors.
Engineering, procurement, and construction management (EPCM)	Percentage of estimated construction cost.	Percentage of detailed construction cost.	Engineered estimate derived from first principles.
Pricing	FOB mine site, including taxes and duties.	FOB mine site, including taxes and duties.	FOB mine site, including taxes and duties.
Owner's costs	Historic estimate.	Estimate from experience,	Estimate prepared from detailed

		factored from similar project.	zero-based budget.
Environmental compliance	Factored from historic estimate.	Estimate from experience, factored from similar project.	Estimate prepared from detailed zero-based budget for design engineering and specific permit requirements.
Escalation	Not considered.	Based on Company's current budget percentage.	Based on cost area with risk.
Accuracy Range	± 50%.	± 25%.	± 15%.
Typical contingency (allowance for items not specified in scope that will be needed)	25%.	15%.	10% (actual to be determined based on risk analysis).
Operating Cost Category	**Scoping Study**	**Prefeasibility Study**	**Feasibility Study**
Basis	Order-of- magnitude estimate.	Quantified estimates with some factoring.	Describes the basis of the estimate; detailed from zero-based budget; minimal factoring.
Operating quantities	General.	Specific estimates with some factoring.	Detailed estimates.
Unit costs	Based on historic data for factoring.	Estimates for labor, power, and consumables, some factoring.	Letter quotes from vendors; minimal factoring
Operating Cost Category	**Scoping Study**	**Prefeasibility Study**	**Feasibility Study**
Accuracy Range	± 35%.	± 25%.	± 15%.
Typical contingency (allowance for items not specified in scope that will be needed)	25%.	15%.	10% (actual to be determined based on risk analysis).

Modified from SME Mining Engineering Handbook, 3rd Edition, 2011, pages 300 and 301, Tables 5.1-1, 5.1-2 and 5.1-3.

APPENDIX A
List of Recognized Professional Organizations (RPOs)

This list of Recognized Professional Organizations (RPOs) includes professional organizations recognized by the National Reporting Organizations of CRIRSCO members in the country or region in which a Professional Organization is headquartered. As stated in the SME Guide, the Competent Person should belong to a Professional Organization with jurisdiction over the Competent Person's actions regardless of where the Competent Person resides, where the Mineral Deposit is located or where the Public Report is issued, and in all cases with the Competent Person subject to the code of ethics of the RPO. Further, the Competent Person should be licensed or registered in any jurisdiction in which such registration is required by law.

This list is updated from time to time by the Society for Mining, Metallurgy, and Exploration, Inc. Organizations which wish to be added to the list should contact the SME at the following address:

Chairperson, Resources and Reserves Committee
Society for Mining, Metallurgy and Exploration, Inc.
12999 E. Adam Aircraft Circle
Englewood, CO 80112
U.S.A.

List dated July 2017; updates can be found at www.smenet.org

Professional Organization	Member Designation
Society for Mining, Metallurgy, and Exploration, Inc. (SME).	Registered Member (RM SME).
American Institute of Professional Geologists (AIPG).	Certified Professional Geologist (CPG).
Any state or territory in the United States of America.	Licensed or Registered as a Professional Engineer (P.E.)
Mining and Metallurgical Society of America (MMSA).	Qualified Professional (QP).
Australasian Institute of Mining and Metallurgy (AusIMM).	Fellow, or Member with Chartered Professional designation (FAusIMM, FAusIMM (CP), MAusIMM (CP).
Australian Institute of Geoscientists (AIG).	Fellow or Member, or Registered Professional Geoscientist Member or Fellow (FAIG, FAIG RPGeo, MAIG, MAIG RPGeo).
The Institution of Engineers Australia (Engineers Australia).	Chartered Professional Engineer (CPEng).
The Institution of Professional Engineers New Zealand (Engineers New Zealand, IPENZ).	Chartered Professional Engineer (CPEng).
Engineering Council of South Africa (ECSA).	Professional Engineer or Professional Certificated Engineer (Pr.Eng. or Pr.Cert.Eng.).
South African Council for Geomatics (SAGC).	Professional Surveyor.
Institute of Mine Surveyors of Southern Africa	Professional Surveyor.

Professional Organization	Member Designation
(IMSSA).	
Southern African Institute of Mining and Metallurgy (SAIMM).	Fellow (FSAIMM).
South African Council for Natural Scientific Professions (SACNASP).	Professional Natural Scientist (Pr.Sci.Nat.).
European Federation of Geologists (EFG).	European Geologist (EurGeol).
Institute of Materials, Minerals and Mining (IOM3).	Fellow, Professional Member, Chartered Scientist, or Chartered Engineer (FIMMM, MIMMM, CSi MIMMM, CEng MIMMM).
Institute of Geologists of Ireland (IGI).	Professional Member (PGeo).
Geological Society of London (GSL).	Chartered Geologist (CGeol).
Comisión Calificadora de Competencias en Recursos y Reservas Mineras (Chilean Mining Commission or Comisión Minera; ChCM).	Registered Member.
Any organization or association of engineers and/or geoscientists given authority or recognition by statute in a jurisdiction of Canada.	Licensed, certified, registered or accepted as a Professional Engineer (P.Eng.) or Professional Geoscientist (P.Geo.)
Russian Society of Subsoil Use Experts (OERN).	Expert class.
Mongolian Professional Institute of Geosciences and Mining (MPIGM)	Fellows and Registered Professional Members.
Brazilian Commission for Resources and Reserves (CBRR).	Registered Qualified Professional.
Professional Association of Independent Experts in Subsoil Use of the Republic of Kazakhstan (PONEN).	Fellow or Professional Member.

APPENDIX B
Glossary

Term	Definition
analogous deposit	A deposit that has similar characteristics to, or is comparable in certain respects to the deposit being investigated.
ancillary rights	Secondary or lesser legal entitlements.
assessment criteria	Factors used or assessed when performing a judgment, opinion, or analysis.
back-in agreement	Reversionary interest where the seller can reacquire an interest share for example in an exploration property; synonym for claw-back right.
balanced judgment	Evaluation of facts and data to form a non-biased decision or opinion.
basis of estimate	Project management tool to document projected costs considering available historical and current cost and schedule data. The basis of estimate defines all aspects of a cost estimate at a set point in time.
benchmark	Comparing a selected metric against other measurements to provide a point of reference. Benchmarks can be based on experience, actual data, or regulatory requirements.
beneficiation studies	Characterization of a deposit with respect to its major metallurgical properties; synonym for ore dressing studies.
brownfield	A project or property which is an operating mine or has been previously operational and is now closed; where all major infrastructure is in place and operational or can be made operational with limited expenditure.
call factor	The ratio, expressed as a percentage, which the specific product accounted for in metallurgical recovery plus residue bears to the corresponding product contained in Mineral Reserves. In reconciliation is the ratio of received at mill/delivered to mill.
claim	Right to extract minerals from a designated tract of land.
classes	Confidence categories of Mineral Resources or Mineral Reserves.
commercially sensitive information	Privileged or proprietary information that, if disclosed, could prejudice commercial interests.
commodity price	Market or negotiated price associated with the purchase or sale of a mineral or material.
Company	A person, partnership, organization, or business that has a legal and separately identifiable existence that owns a mineral property or project, or that has an interest in a mineral property or project.
Competent Person	A Competent Person is a minerals industry professional who is a Registered Member of SME or a designated member of an approved "Recognized Professional Organization" (RPO) included in a list promulgated by SME from time to time (Appendix A). A requirement for a professional organization to be recognized as an RPO is that it has enforceable disciplinary processes including the powers to suspend or expel a member regardless of the project's location. A Competent Person must have a minimum of five years relevant experience in the style of mineralization or type of deposit under consideration and in the activity which that person is undertaking.
Competent Person Firm	A partnership, limited liability company, or other legal entity that can be named as the Competent Person for a Public Report.
comprehensive study	A study that has a broad scope and content, involves in-depth technical and scientific assessments, and identifies major risks and opportunities.

Term	Definition
conflict minerals	One of four minerals, columbite–tantalite, cassiterite, gold, wolframite, or their derivatives; or any other mineral or its derivatives determined by the U.S. Secretary of State to be financing conflict in the Democratic Republic of the Congo. Current U.S. legislation requires public companies to provide disclosures about the use of these conflict minerals emanating from the DRC and nine adjoining countries.
consent	Written permission provided by a Competent Person to publish documentation in the form and context in which it will appear on publication.
contained metal or product	Amount of metal or product in a specified volume or tonnage.
contaminants (deleterious elements)	Non-economic elements in the mining and processing sequence that have an impact on mining or processing operations, incur a penalty in product marketing, affect product salability, or require environmental management; synonym for deleterious elements.
contingency	An allowance for items not specified in scope that will be needed, or unanticipated changes in costs, as for example adverse foreign exchange consequences. Contingencies are additive to the cost estimates. Where the data on which the estimate basis are limited, contingency may be specified for the entire estimate. Where sufficient data exist, contingency should be set by facility or cost element (typically as a percentage addition), and a summary of all contingencies should be presented as part of the summary of capital and operating cost estimates.
credible market entry strategy	Realistic determination of how to sell, deliver, and distribute a product.
CRIRSCO	Committee for Mineral Reserves International Reporting Standards.
CRIRSCO Template	A living document that draws on the consensus of the CRIRSCO-style reporting standards to provide a guideline that encapsulates the content of these standards for the benefit of the international mining industry and its various stakeholders.
cut-off	The lowest grade, thickness, grade times (x) thickness, or net smelter return of mineralization that is considered or planned to be economically extracted.
data aggregation	A process in which information or data are collated and presented in a summary format for data analysis purposes.
deposit type	An analogue deposit that is used as the exemplar for all other deposits with similar descriptive and genetic characteristics, e.g., Carlin-type deposits, Stillwater-type deposits.
dilution	Dilution is any low-grade (waste or backfill) material which comes into an ore stream, and reduces the value of the ore stream. Dilution can be divided into external or internal dilution, where internal dilution is internal material below cut-off grade within a reserve block, and external dilution is material below cut-off grade that is outside the reserve bock and must be mined together with the ore. It can be expressed as the percentage material that is classified as waste, as the amount that the mined tonnage will increase, or as a grade reduction. Synonym for mining dilution.
disclosure	Provision of certain information about a Company's activities and financial status.
discount rate	The interest rate used in discounted cash flow analysis to determine the net present value of future cash flows.

Term	Definition
discounted cash flow	A valuation method used to estimate the attractiveness of an investment opportunity, and provide a time-value of money for investment comparison purposes using three key metrics: time, the amount of cash flow expected in defined timeframes, and the expected rate of return. In a discounted cash flow, the future value of a cash flow is discounted by an appropriate discount rate and time period to arrive at the present value.
documentation	A set of documents that provides a record or reference.
economic feasibility	Cost benefit analysis of a mine or project in terms of costs and revenues to determine if the project returns an acceptable profit and whether it is possible to logistically complete the project as envisaged.
economic studies	Prefeasibility, Feasibility or life-of-mine plans that demonstrate the economic viability of Mineral Reserves. Scoping studies that demonstrate the potential economic viability of Mineral Resources.
economic viability	Assessment using a cash flow analysis as to whether a mine or project can show a positive return. Exploration Targets must be excluded from economic evaluations of Mineral Resources and when presenting the mine plan and economic analysis results in a Scoping Study. Exploration Targets and Inferred Mineral Resources must be excluded when demonstrating the economic viability supporting the declaration of Mineral Reserves.
effective date(s)	The cut-off date for the supply of material scientific, technical and economic information contained in a Public Report, Mineral Resource estimate or Mineral Reserve estimate. If relevant, separate dates may be specified for drilling, database, metallurgical test work, Technical Studies, etc.
environmental factor	One of a set of fundamental environmental criteria taken into consideration when evaluating the environmental impact of a mine or project.
environmental impacts	Adverse effects on the existing environment, whether anticipated or actual.
environmental requirements	Standards or regulations which seek to mitigate or avert environmental impacts and the obligatory monitoring which must be performed in support of meeting these standards or regulations.
Exploration Information	Includes Exploration Targets and Exploration Results. An Exploration Target represents a geological concept to be tested to determine the existence of a Mineral Deposit. Information to be sought by exploration is termed an Exploration Target. Information gained through exploration is termed Exploration Results.
Exploration Results	Exploration Results include data and information generated by mineral exploration programs that might be of use to investors but which do not form part of a declaration of Mineral Resources or Mineral Reserves.
exploration strategy	Method by which a Company prioritizes how projects will receive exploration funding or the sequence of exploration activities in a district being explored.
Exploration Target	An Exploration Target is a statement or estimate of the exploration potential of a Mineral Deposit in a defined geological setting where the statement or estimate, quoted as a range of tonnes and a range of grade or quality, relates to mineralization for which there has been insufficient exploration to estimate Mineral Resources.

Term	Definition
Feasibility Study	A Feasibility Study is a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable Modifying Factors together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate at the time of reporting that extraction is reasonably justified (economically mineable). The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project. The confidence level of the study will be higher than that of a Pre-Feasibility Study.
firm	A third-party separate from a Company providing services to a Company. (see also Competent Person Firm).
governmental factor	One of a set of fundamental governmental criteria taken into consideration when evaluating the current or future regulations that may impact on a mine or project.
greenfield	A project or property which has never been in formal operation, and for which no major mining or processing infrastructure has been constructed.
health impact; health impact assessment	A strong effect on health status that will affect someone or something; a means of assessing the effects of policies, plans and projects in diverse economic sectors on health status, using quantitative, qualitative, and participatory techniques.
historical estimate	An estimate of Mineral Resources, Mineral Reserves, or Exploration Target tonnages and grades that was performed by a third-party or unrelated party prior to a Company's acquisition of an interest in the Mineral Deposit under consideration.
Indicated Mineral Resource	An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.
industrial minerals	Solid geological materials which are mined for their commercial value, which are not fuel and are not sources of metals.
Industry Guide 7	“Description of Property by Registrants Engaged or to be Engaged in Significant Mining Operations,” which is the basic mining disclosure policy of the Division of Corporation Finance of the U.S. Securities and Exchange Commission.
Inferred Mineral Resource	An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
infrastructure	The basic physical and organizational structures and facilities needed for mine operation.

Term	Definition
inventory reports	Non-public reports providing tonnages and grades for Mineral Deposits that may not consider the application of reasonable prospects for economic extraction.
land (mineral) tenure	Systems for determining rights to use and enjoy land that provide a mechanism for identifying who has the right to use and occupy land in accordance with the different types of land ownership.
lease	A permit, claim, or license that allows for exploration, or mining, or beneficiation activity, depending on the jurisdiction and applicable mining laws.
legal factor	One of a set of fundamental legal criteria taken into consideration when evaluating the legal regime that may affect mine construction, operation or closure.
legal rights	Legally-guaranteed powers available to a legal entity in realization or defense of its just and lawful claims or interests.
life-of-mine plan	A time-phased mine plan that details the schedule, assumptions, and financial conditions under which the Mineral Reserves will be profitably extracted.
marginal material	Mineralized material that will be mined and/or stockpiled, i.e. processing is deferred for various reasons such as material is currently sub-economic, it would displace higher grade material in the plant, or contains detrimental elements or characteristics, etc.
market acceptance	A measure by which a product or product specifications will be saleable to sufficient parties to warrant mine development or an increase in mine production. Initial market acceptance means at least one end-user has indicated interest; minimum market acceptance means a sufficient number of end-users have indicated interest such that project development can be supported.
marketable reserves	For coal, the tonnage of coal, at specified moisture and quality, that is available for sale after beneficiation; similar definition can apply to industrial minerals and other bulk commodities.
marketing factor	One of a set of fundamental marketing and marketability criteria taken into consideration when evaluating the market for a mine's output.
materiality principle	Public Reports must contain all relevant information for the purpose of making a reasoned and balanced judgment regarding the Exploration Information, Mineral Resources or Mineral Reserves being reported.
Measured Mineral Resource	A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.
metal content	Amount of metal contained in a specified volume.
metal equivalent	A term used where mineralization that has several different metals of economic value has those different metal values converted to the corresponding value of a single metal. Metal equivalents must take into account commodity prices and metallurgical recovery. Metal equivalent calculations are often used to compare similar deposits that have slightly different metal ratios.
metallic deposits	Mineral deposits mined to extract metallic elements.

Term	Definition
metallurgical factor	One of a set of fundamental metallurgical or processing criteria taken into consideration when evaluating the recoveries or processing routes for a mine or project.
mill recovery/process recovery	The percentage of the element(s) of interest that can be recovered through the process plant following metallurgical or other treatment.
mine closure	The period of time when active mining has ceased, and final decommissioning and mine reclamation is underway. Mine closure is considered to be complete when an entity has demonstrated to the satisfaction of the appropriate regulatory authorities that the mining project has reached a safe, stable, self-sustaining, and rehabilitated state.
Mineral Deposit	A Mineral Deposit (including coal, diamonds, and industrial minerals) is an accumulation of mineral(s) of potential economic interest within estimated geological boundaries.
mineral property	An area of land that is held under exploration or mining rights. The definition includes multiple mineral claims or other documents of title that are contiguous or in such close proximity that any underlying Mineral Deposits would likely be developed using common infrastructure. Multiple mineral claims are often also referred to as a "mineral project".
Mineral Reserve	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 or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The reference point at which Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.
Mineral Resource	A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction.
mineralized waste	Waste rock that contains mineralization that grades below the currently economic cut-off.
minimum mining thickness	The smallest thickness used that can be economically mined; thicknesses will vary depending on the mining method selected, and the minimum opening size required.
mining factor	One of a set of fundamental mining criteria taken into consideration when evaluating the mining methods for a mine or project.
mining loss	Mining loss refers to any unrecoverable ore that must be left behind during mining, or any ore that cannot be recovered or processed through the process plant. Synonym for ore loss.
mining option	A set of alternative mining, processing or other options that must be examined to select a single method for future detailed work.
mining recovery	The percentage of the tonnage or contained element(s) or product of interest that can be recovered and delivered for beneficiation by the selected mining method.

Term	Definition
mining schedule	A practical, realistic, and optimal strategy for ore extraction that has been developed after review of all material options and scenarios, including investment and scheduling alternatives (e.g., equipment sizes and placements), ore definition (e.g., cut-off grades, dilution), access mechanics (e.g., shaft or ramp location, pit limits), and ore and waste removal and haulage sequences.
Modifying Factors	Modifying Factors are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors.
National Reporting Organizations	Groups responsible for developing and maintaining reporting guides, codes, and standards for CRIRSCO member countries/regions.
Passive Interest	A royalty, streaming or other similar interest in a mineral property or properties.
peer	Person with in-depth experience with respect to a specific area, e. g, exploration, Mineral Resource estimation, Mineral Reserve estimation, metallurgical test work, economic analysis, etc.
peer review	Evaluation of scientific, academic, professional, or technical work by others who have experience in and are working in the same field.
physical specifications	The essential characteristics that a product must meet to be saleable; or a range of technical parameters that the product must fall within to be saleable.
political factor	One of a set of fundamental political influences taken into consideration when evaluating the political regime that may affect mine development, construction, operation, or closure.
Pre-Feasibility Study	A Pre-Feasibility Study is a comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method, in the case of underground mining, or the pit configuration, in the case of an open pit, is established and an effective method of mineral processing is determined. It includes a financial analysis based on reasonable assumptions on the Modifying Factors and the evaluation of any other relevant factors which are sufficient for a Competent Person, acting reasonably, to determine if all or part of the Mineral Resource may be converted to a Mineral Reserve at the time of reporting. A Pre-Feasibility Study is at a lower confidence level than a Feasibility Study.
Probable Mineral Reserve	A Probable Mineral Reserve is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.
processing factor	One of a set of fundamental metallurgical or processing criteria taken into consideration when evaluating the processing methods for a mine or project.
process flow sheet (also known as process flow diagram)	A graphical representation of the unit operations required to produce a saleable product and to prepare tailings for suitable disposal. The unit operations are arranged sequentially beginning with the arrival of ore at the processing facility and ending at shipment of the end product(s) off site and the discharge of tailings to the tailings facilities. The level of detail increases as projects progress. For a scoping study, the flow sheet may simply be a block flow sheet listing the proposed unit operations for the conceptual process design. For pre-feasibility and feasibility studies, the flow sheets should represent the process in sufficient detail to develop capital cost estimates required to meet the reported level of accuracy of the study. This includes such detail as pumps, number of equipment pieces and sizes, chutes, bins, and flow sheets for support areas such as water management, reagent storage and mixing, and tailings treatment.

Term	Definition
production schedule	The preferred extraction schedule for mining of ore and waste.
production sharing	A contract between one or more entities and the government in which rights to prospecting, exploration, and extraction of mineral resources from a specific area over a specified period of time are determined.
project financing	Long-term financial support for mine development that is based on the project's forecast cash flow.
proponent	An individual or Company that publicly supports a specific action or plan, and argues for it.
Proven Mineral Reserve	A Proven Mineral Reserve is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.
proximate statement	A set of text that is placed near to, or very near to, another sentence or paragraph. Typically, a proximate statement consists of a notification to the reader of risks associated with the text that follows or precedes such a cautionary statement.
Public Reports	Public Reports are reports prepared for the purpose of informing investors or potential investors and their advisers on Exploration Results, Mineral Resources or Mineral Reserves. They include, but are not limited to annual and quarterly Company reports, press releases, information memoranda, technical papers, website postings and public presentations.
Recognized Professional Organization	Approved Recognized Professional Organizations (RPO) are included in a list promulgated by SME from time to time (see Appendix A of the SME Guide). A requirement for a professional organization to be recognized as an RPO is that it has enforceable disciplinary processes including the powers to suspend or expel a member regardless of the project's location. Competent Persons must belong to a RPO at the membership levels shown in Appendix A of the SME Guide.
reference point	Location where product is sold to the customer; may occur at the mine mouth, plant gate, port, or smelter.
Regulation S-K	Regulation under the U.S. Securities Act of 1933 that sets out disclosure requirements for various U.S. Securities and Exchange Commission filings that must be used by public companies.
remnant	A part or quantity of ore or mineralization that is left after the greater part of the ore or mineralization has been mined.
Reserve Test	A test that should be conducted at least annually for Mineral Reserves to verify that the future undiscounted cash flow from reserves is positive.
run-of-mine	Mined ore in its natural, unprocessed state prior to any beneficiation or processing activity being undertaken.
saleable content	The amount of an element or material within a deposit that can be economically marketed.
saleable product	The material or product that can be sold or marketed.
sales volume	The quantity, amount, or number of products sold in a specified time period.
Scoping Study	A Scoping Study is an order of magnitude technical and economic study of the potential viability of Mineral Resources that includes appropriate assessments of realistically assumed Modifying Factors together with any other relevant operational factors that are necessary to demonstrate at the time of reporting that progress to a Pre-Feasibility Study can be reasonably justified.
SEC	U.S. Securities and Exchange Commission.
social factor	One of a set of fundamental social impact criteria taken into consideration when evaluating the likely social impacts of a mine or project.

Term	Definition
social license	The level of acceptance or approval from stakeholders towards a mining project.
socio-economic impact	A strong effect on the existing socio-economic status that will affect someone or something.
socio-economic requirements	Regulations that require documentation and monitoring of socio-economic impacts.
specialist	An individual, entity, or firm that is highly skilled in and has detailed knowledge of a specific and restricted field.
stakeholder	A person, group, community, or organization that has an interest or concern in something where that interest can affect or be affected by a Company's actions, objectives, and policies. Stakeholders subsets include: primary stakeholders (directly affected or can directly affect); secondary stakeholders (indirectly affected, or can indirectly affect); key stakeholders (those who have a major influence).
stockpiles	A pile or storage location for bulk materials, usually low-grade and often below the operating cut-off grade.
stope fill	Artificial support media used to maintain stope stability. Fill materials can include waste rock, low-grade mineralization, tailings, paste or sand fill, etc.
stope pillar	A column of material that is not mined, and is left behind to support the stope.
streaming agreement	An agreement between a Company and an investor for the investor to purchase a percentage of the Company's future production at a fixed price below the current market value. The future production that is the subject of the sale is often a by-product element of the Company's main operations. Also known as resource streaming or metal purchase agreements.
strip ratio	The ratio of the amount of waste rock stripped to ore mined; may be with respect to volume or tonnage.
Summary Technical Report	A summary of a technical document such as a Scoping, Pre-Feasibility or Feasibility Study or life-of-mine plan that presents the summarized information under a set of prescribed headings or sections. A Summary Technical Report should address all the relevant assessment criteria in Table 1 of the SME Guide in written format.
sunk costs	A cost that has already been incurred and cannot be recovered. Also known as a retrospective cost.
supplemental information	Information provided voluntarily to, or requested by U.S. Securities and Exchange Commission staff that is not required as part of an entity's statutory reporting obligations.
supporting documentation	Additional data or reports that supplement or provide back up to a key document.
sustainability	A concept of giving thought to the future to ensure the well-being and quality of life of present and future generations, using the principles of environmental stewardship and preservation, fairness and equity, and participation and partnership.
sustainable development	Sustainable development in mining is the use of the economic benefits of mineral production to build infrastructure and systems within the neighboring communities which will persist beyond mine closure. These may include transportation, communication, health, education, and commercial development as well as training and skills imparted to the inhabitants which can improve economic opportunities for the workers and families during and after mine operation.

Term	Definition
tangible asset	An asset in material or physical form that has a long-term existence, or is acquired for the purposes of mining or processing activities, e.g., land, machinery, equipment, plant, etc.
Technical Studies	Technical Studies include Scoping Studies, Pre-Feasibility Studies, and Feasibility Studies. Other studies may include aspects of exploration, Mineral Resource estimation, mine planning including life-of-mine plans, metallurgical test work, environmental or social studies such as Environmental Impact Assessments and Environmental and Social Impact Assessments, etc.
the SME Guide	2017 SME Guide for Reporting Exploration Information, Mineral Resources, and Mineral Reserves.
tonnage	The weight of material mined; usually specified as ore or waste; in coal and industrial minerals production units may be expressed as volume.
Transparency principle	Transparency requires that the reader of a Public Report is provided with sufficient information, the presentation of which is clear and unambiguous, so as to understand the Public Report and not to be misled.
waste	Unmineralized material that is displaced by mining activity to reach ore.

APPENDIX C
Example of Consent of Competent Person

The Company should obtain the consent of the Competent Person to all Public Reports including information provided by the Competent Person. An example of the consent of a Competent Person to a Public Report[3] follows:

[CP's Letterhead] or
[Insert name of CP]
[Insert address of CP]

CONSENT of COMPETENT PERSON

I, [name of CP], consent to the disclosure of the information in [insert title of documentation (e.g., news release, website, investor presentation)] that is dated [insert date of document] and confirm that the information for which I am responsible is based on, and fairly and accurately reflects, in the form and context in which it appears, the information in my supporting documentation relating to [briefly summarize the type of information for which the CP is responsible (e.g., Exploration Information, Mineral Resources, Mineral Reserves, metallurgical test work, mine planning, environmental statements, financial data, etc.)].

Dated this [insert date].

_____ [RPO Name and Membership Category; Seal or Stamp as appropriate]
Signature of Competent Person

_____
Print name of Competent Person

[3] This Consent is only one example of a Competent Person's consent to disclosure of a Public Report. It is unlikely to be suitable for use in every situation in which the consent of a Competent Person is required. Accordingly, Companies making Public Reports and Competent Persons consenting thereto should ensure that the form of Consent used is appropriate for, and accurately reflects the circumstances of, their own situation. By supplying this example of a Competent Person's Consent to a Public Report, SME is not providing legal advice and does not mean to imply or suggest that this example complies with any applicable laws, including but not limited to United States or foreign securities laws.

APPENDIX D
Public Report Formats

It is recognized that Public Reports can vary in detail from news releases, to website postings, to technical studies, which may be based on Scoping to Pre-Feasibility to Feasibility studies to life-of-mine plans.

In addition to following the basic principles of materiality, transparency and competence, the Competent Person should:

- verify and take responsibility for the data used;
- determine the material issues and (usually) present them to the public in summary form; this may take the form of stating material assumptions to support news releases or more formal reports, particularly for summarization of technical studies. In these cases, the term "Summary Technical Report" may be used, even if there is only documentation and supporting information rather than an actual technical report as back-up; and
- take cognizance of any regulatory requirements regarding the timing, format, and content of Public Reports.

The CRIRSCO-compliant reporting systems use one of two formats to provide information on mineral projects: either a table summarizing information, or a more formal summary technical report document. The Competent Person is recommended to follow one of these formats.

Some countries require specific reporting formats for Public Reports. The SME Guide is based on the CRIRSCO Template to which all CRIRSCO members subscribe. In principle, a report prepared using the SME Guide should be acceptable for filing in any jurisdiction accepting a CRIRSCO-Template compatible standard, code, or guide for public reporting. Similarly, the use of a Public Report prepared in another jurisdiction under a CRIRSCO-Template compatible standard, code or guide can satisfy the requirements of the SME Guide. There can be minor differences between the CRIRSCO-Template compatible standards. If and to the extent that there are material differences between the information reported using another CRIRSCO-Template compatible standard and how it would be reported under the SME Guide, the information should be reconciled to the definitions and standards in the SME Guide and, as appropriate, substituting disclosure satisfying the SME Guide definitions and standards, including an explanation of those aspects of the reporting systems causing the differences.

While noting that it is common practice to capitalize terms that are defined in the CRIRSCO Template, the Competent Persons may use their own style with respect to capitalization, italics, underlining, bold font, etc.

Format 1: Comments on Table 1 of the SME Guide

The Competent Person prepares a letter-report or in some cases an appendix in tabular form to a news release or other public disclosure that includes commentary on relevant assessment criteria in Table 1 of the SME Guide. This report or documentation serves in place of a Summary Technical Report.

Where the Mineral Deposit is relatively simple in geology, mining or beneficiation, comments on Table 1 of the SME Guide will usually suffice to provide a means of conveying material information in a transparent manner. In addition, where a Company is vertically integrated, and mining provides a feedstock to a process that creates a saleable product, with the economic benefit largely coming through a manufacturing process, extensive discussion of geology, mining and on-site beneficiation could be judged immaterial, and comments on Table 1 might be contained in the footnotes to estimated Mineral Resource and Mineral Reserve statements.

Public Reporting using the format set out in the JORC Code is generally acceptable under the SME Guide. That format requires comments on all items of Table 1 of the JORC Code, with statements as to if some items are not relevant, why they are not relevant.

Format 2: Summary Technical Report

Summary Technical Reports are particularly useful for the following:

- providing information about projects and operations;
- providing information in support of mergers, acquisitions, and other corporate arrangements including offerings to sell securities; and
- providing structured evidence of compliance of a business process to estimate Mineral Resources and Mineral Reserves to support a Company's Sarbanes-Oxley Act compliance obligations.

A Summary Technical Report should address all applicable criteria in Table 1 of the SME Guide in written format. Below are the recommended sections for a Summary Technical Report:

- Section 1: Summary
- Section 2: Introduction
- Section 3: Reliance on Other Specialists
- Section 4: Property Description and Location
- Section 5: Accessibility, Climate, Local Resources, Infrastructure and Physiography
- Section 6: History
- Section 7: Geological Setting and Mineralization
- Section 8: Deposit Types
- Section 9: Exploration
- Section 10: Drilling
- Section 11: Sample Preparation, Analyses and Security
- Section 12: Data Verification
- Section 13: Mineral Processing and Metallurgical Testing
- Section 14: Mineral Resource Estimates
- Section 15 Mining Methods and Mine Plan
- Section 16: Recovery and Processing Methods
- Section 17: Project Infrastructure
- Section 18: Market Studies and Contracts
- Section 19: Environmental Studies, Permitting, and Social or Community Impact
- Section 20: Capital and Operating Costs

- Section 21: Economic Analysis
- Section 22: Mineral Reserve Estimates
- Section 23: Adjacent Properties
- Section 24: Other Relevant Data and Information
- Section 25: Interpretation and Conclusions
- Section 26: Recommendations
- Section 27: References

Not all sections will apply to all projects. Appropriate figures and tables should be included. In general appendices are not considered to be necessary. Information discussed in one section need not be repeated in another.

Public Reporting using the format set out in Canadian National Instrument 43-101 Form F1 or set out in the SAMREC Code is acceptable under the SME Guide. Those formats are very similar to the contents for a summary technical report listed above.

[U.S. SEC Filings

The following language is provisional and is suggested by SME for SEC consideration:

Industry Guide 7 constitutes the basic mining disclosure policy of the Division of Corporation Finance of the SEC for Companies that are engaged or to be engaged in significant mining operations. As a result of recent amendments to Industry Guide 7, registrants are encouraged to refer to the SME Guide when seeking to interpret Industry Guide 7. All information subject to Industry Guide 7 that is filed with the SEC is a Public Report subject to this SME Guide. In most cases "supplemental information" that is not filed but merely provided on a confidential basis to the SEC staff in accordance with Industry Guide 7 will nevertheless be a Public Report subject to this SME Guide.**]**

APPENDIX E
Example of Certificate of Competent Person

In some circumstances, certificates of Competent Persons are included in Public Reports, such as summary technical reports or supporting documentation.

Generally speaking, a Certificate of a Competent Person should contain the following information[4]:

(a) the name, address, and occupation of the Competent Person;

(b) the title and effective date of the summary technical report or supporting documentation to which the certificate applies;

(c) the Competent Person's qualifications, including a brief summary of relevant experience, the name of all professional associations to which the Competent Person belongs, and a statement that the Competent Person is a "Competent Person" as defined by of the SME Guide;

(d) the date and duration of the Competent Person's most recent personal inspection of each property, if applicable;

(e) the item or items of the summary technical report or supporting documentation for which the Competent Person is responsible;

(f) whether the Competent Person is independent of the Company as described in Clause 8 above of the SME Guide;

(g) what prior involvement, if any, the Competent Person has had with the property that is the subject of the summary technical report or supporting documentation;

(h) that the Competent Person has read the SME Guide, and the summary technical report or supporting documentation, or part that the Competent Person is responsible for, has been prepared in compliance with the SME Guide; and

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[4] The information provided in the Competent Person's Certificate appended to or included in a Public Report may vary considerably from the information listed here, depending on the Public Report, the Competent Person's responsibilities with respect to that Public Report, and the legal, regulatory or other applicable requirements for, or restrictions on, certifications by Competent Persons. This list is therefore unlikely to be suitable for use in every situation in which a Competent Person certifies a Public Report. Accordingly, Companies making Public Reports and Competent Persons should ensure that the Certificate actually used is appropriate for, and accurately reflects the circumstances of, their own situation. By supplying this list of the typical contents of a Competent Person's Certificate for a Public Report, SME is not providing legal advice and does not mean to imply or suggest that a Certificate including the information on the list complies with any applicable laws, including but not limited to United States or foreign securities laws.

(i) that, at the effective date of the summary technical report or supporting documentation, to the best of the Competent Person's knowledge, information, and belief, the summary technical report or supporting documentation, or the portions of the summary technical report or supporting documentation that the Competent Person is responsible for, contains all scientific and technical information that is required to be disclosed to make the summary technical report or supporting documentation not misleading.

APPENDIX F
Examples of Cautionary Language and Expert Reliance

Some examples of the types of cautionary language that can be used by Companies and Competent Persons in Public Reports follow[5]:

Exploration Targets

If a tonnage and grade range estimate for an Exploration Target is being presented:

"The potential quantity and grade are conceptual in nature, and there has been insufficient exploration to define the exploration targets as a Mineral Resource. It is uncertain if additional exploration will result in the target(s) being delineated as a Mineral Resource."

Mineral Resources

If Mineral Resources are being presented inclusive of those Mineral Resources modified to produce Mineral Reserves:

"Mineral Resources are tabulated inclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability."

If Mineral Resources are being presented exclusive of those Mineral Resources modified to produce Mineral Reserves:

"Mineral Resources are tabulated exclusive of Mineral Reserves."

Scoping Study

If an economic analysis of Measured and/or Indicated Mineral Resources is being presented in a Scoping Study:

"Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability."

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[5] The foregoing examples of cautionary language and language concerning reliance on experts are provided for illustrative purposes for the convenience of users of the SME Guide. They do not constitute legal advice. By selecting these examples, SME does not suggest or imply that the circumstances suggested by these examples are more likely to be encountered than others. Moreover, the examples given are not meant to be comprehensive, as there are innumerable other situations in which entirely different language may be more appropriate. It is unlikely that, even in similar situations, the specific language in the examples will be suitable for use in actual Public Reports covering such situations. Accordingly, Companies making Public Reports and Competent Persons consenting thereto should ensure that the language actually used is appropriate for, and accurately reflects the circumstances of, their own situation. By supplying these examples, SME is not providing legal advice and does not mean to suggest that any of the examples given would satisfy applicable laws concerning disclosure of material information, including but not limited to United States or foreign securities laws.

If an economic analysis of Mineral Resources that includes consideration of Inferred Mineral Resources is being presented in a Scoping Study:

"Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. The economic analysis in the Scoping Study is preliminary in nature, it includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the outcomes provided in the Scoping Study will be realized."

Production Dates

If information on execution plans or other forecasts as to actual dates for information such as permit grants, completion of project milestones or production data on a calendar year basis is being presented in a mining study:

"The production schedules and financial analysis annualized cash flow table are presented with conceptual years shown. Years shown in these tables are for illustrative purposes only."

"Calendar years are used in some sections of the Public Report, in relation to the proposed mine plan and execution plan. The years shown are for illustrative purposes; the actual timing may vary. Additional mining, technical, and engineering studies are planned which may alter the assumptions as discussed in this Public Report, and may result in changes to the calendar timelines presented."

Forward Looking Information

If information that can be considered forward-looking is included in the Public Report for a project that is not in operation:

"Certain information and statements contained in this Public Report are "forward looking" in nature. Forward-looking statements include, but are not limited to, statements with respect to the economic and study-level parameters of the Project; Mineral Resource and Mineral Reserve estimates; the cost and timing of any development of the Project; the proposed mine plan and mining methods; dilution and mining recoveries; processing method and rates and production rates; projected metallurgical recovery rates; infrastructure requirements; capital, operating and sustaining capital cost estimates; the projected life of mine and other expected attributes of the Project; the net present value (NPV) and internal rate of return (IRR) and payback period of capital; capital; future metal prices and market conditions ; the timing of the environmental assessment process; changes to the Project configuration that may be requested as a result of stakeholder or government input to the environmental assessment process; government regulations and permitting timelines; estimates of reclamation obligations; requirements for additional capital; environmental risks; and general business and economic conditions.

All forward-looking statements in this Public Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this Public Report, where applicable. In addition to, and

subject to, such specific assumptions discussed in more detail elsewhere in this Public Report, the forward-looking statements in this Report are subject to the following assumptions:

- *there being no significant disruptions affecting the development and operation of the Project;*
- *the availability of certain consumables and services and the prices for power and other key supplies being approximately consistent with assumptions in the Public Report;*
- *labor and materials costs being approximately consistent with assumptions in the Public Report;*
- *permitting and arrangements with stakeholders being consistent with current expectations as outlined in the Public Report;*
- *all environmental approvals, required permits, licenses and authorizations will be obtained from the relevant governments and other relevant stakeholders within the expected timelines indicated in the Report;*
- *certain tax rates, including the allocation of certain tax attributes, being applicable to the Project;*
- *the availability of financing for planned development activities;*
- *the timelines for exploration and development activities on the Project;*
- *assumptions made in Mineral Resource and Mineral Reserve estimates, including, but not limited to, geological interpretation, grades, metal price and exchange rate assumptions, metallurgical and mining recovery rates, geomechanical and hydrogeological assumptions, capital and operating cost estimates, and general marketing, political, business and economic conditions.*

The Company and the Competent Persons who authored the Public Report undertake no obligation to update publicly or otherwise revise any forward-looking statements whether as a result of new information or future events or otherwise, except as may be required by law."

If information that can be considered forward-looking is included in the Public Report for a project that is operating:

"Certain information and statements contained in this Public Report are "forward looking" in nature. Forward-looking statements include, but are not limited to, statements with respect to the economic assumptions for the operation, Mineral Resource and Mineral Reserve estimates, mine production forecasts, the mine plan and development sequence, dilution and mining recoveries; processing method and production rates; metallurgical recovery; capital, operating and sustaining capital cost estimates; ability to maintain social license to operate; ability to meet government regulations; meeting environmental and permitting requirements; estimates of reclamation obligations; and general business and economic conditions. The results depend on inputs that are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

All forward-looking statements in this Public Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this Public Report, where applicable. In addition to, and subject to, such specific assumptions discussed in more detail elsewhere in this Public Report, the forward-looking statements in this Report are subject to the following assumptions includes:

- *mineral Resource and Mineral Reserve estimates;*

- *assumed commodity prices and exchange rates;*
- *the proposed mine production plan;*
- *projected recovery rates;*
- *sustaining costs and proposed operating costs;*
- *assumptions as to closure costs and closure requirements; and*
- *assumptions as to environmental, permitting, and social risks.*

Additional risks to the forward-looking information include:

- *unexpected variations in quantity of mineralized material, grade or recovery rates;*
- *geotechnical and hydrogeological considerations during mining being different from what was assumed;*
- *changes to costs of production from what is assumed;*
- *failure of plant, equipment or processes to operate as anticipated;*
- *unrecognized environmental, social or permitting risks;*
- *unanticipated reclamation, remediation or closure expenses; and*
- *accidents, labor disputes and other risks of the mining industry.*

The Company and the Competent Persons who authored the Public Report undertake no obligation to update publicly or otherwise revise any forward-looking statements whether as a result of new information or future events or otherwise, except as may be required by law."

Some examples of the types of expert or specialist reliance language that can be used in Public Reports are provided below; examples are based on the Summary Technical Report sections.

Example 1. Where information has been obtained in relation to property agreements, mineral tenure, surface rights, or royalties:

"The Competent Persons have not independently reviewed ownership of the Project area and any underlying property agreements, mineral tenure, surface rights, or royalties. The Competent Persons have fully relied upon, and disclaim responsibility for, information derived from Company and legal experts retained by the Company for this information through the following documents:

- *author name, date: Document Title: name of firm who authored the report and who the report was prepared for, report date, and number of pages. [repeat for each report relied upon]*

This information is used in Sections 4, 14, 21, and 22 of the Summary Technical Report.

Example 2. Where information has been obtained in relation to environmental, permitting, closure planning, and social and community impacts:

"The Competent Persons have not independently reviewed environmental, permitting, closure planning, and social and community impacts. The Competent Persons have fully relied upon, and disclaim responsibility for, information derived from Company and specialist experts retained by the Company for this information through the following documents:

- *author name, date: Document Title: name of firm who authored the report and who the report was prepared for, report date, and number of pages. [repeat for each report relied upon]*

This information is used in Sections 14, 19, 21, and 22 of the Summary Technical Report.

Example 3. Where information has been obtained in relation to product marketing or metal pricing:

The Competent Persons have not independently reviewed the marketing or metal price forecast information. The Competent Persons have fully relied upon, and disclaim responsibility for, information derived from Company and specialist experts retained by the Company for this information through the following documents:

- *author name, date: Document Title: name of firm who authored the report and who the report was prepared for, report date, and number of pages. [repeat for each report relied upon]*

This information is used Sections 14, 18, 21, and 22 of the Summary Technical Report.

Metals marketing, global concentrate market terms and conditions, and metals forecasting are specialized businesses requiring knowledge of supply and demand, economic activity and other factors that are highly specialized and requires an extensive database that is outside of the purview of a Competent Person. The CPs consider it reasonable to rely upon the Company and its specialist experts for such information [insert explanation as to why the reliance is acceptable. e.g., if the information is provided by the Company itself: as the Company is a major global supplier of copper concentrates to the market, and maintains a specialist marketing and contracts department that tracks the copper concentrate market; or e.g., if the information is provided by a specialist expert: as the expert's firm is a global leader in commercial intelligence for the energy, metals and mining industries, and provides independent analysis and advice on assets, companies and markets to these industries]."

Example 4. Where information has been obtained in relation to valuations (e.g., diamond valuations):

The Competent Persons have not independently reviewed the diamond valuations, and have fully relied upon, and disclaim responsibility for, information derived from Company and specialist experts retained by the Company for this information through the following documents:

- *Author name, date: Document Title: name of firm who authored the report and who the report was prepared for, report date, and number of pages. [repeat for each report relied upon]*

This information is used Sections 14, 18, 21, and 22 of the Summary Technical Report.

The CPs consider it reasonable to rely upon the Company and its specialist experts for such information [insert explanation as to why the reliance is acceptable. e.g., if the information is provided by the Company itself: because the valuation was provided by the rough diamond distribution arm of the Company and is the world's largest supplier of rough diamonds, handling nearly half of the world's supply by value; or e.g., if the information is provided by a specialist expert: because the valuation was provided by the specialist expert's firm, which is a recognized international leader in this field, and is the valuer for selected government entities who have diamond royalty interests.]

The Competent Persons are not able to apply quality control measures to the valuation process performed by either the Company or its specialist expert. The reason for this is that diamond valuation is, at best, only partially analytical (in the way that a gold assay process can be termed analytical), as the diamonds are sieved and subjectively classified by color, clarity, etc. The dollar per carat determinations for various stones, however, is ultimately governed by the valuator's price-book. This part of the process is proprietary, governed by a given valuator's view of the marketplace and can vary from valuator to valuator, particularly for larger stones. Even in larger parcels, valuators must then 'model' or extrapolate values in the larger stone size classes where there may be few representatives. The methodology for modeling is also proprietary. These diamond valuation procedures do not lend themselves to quality control measures that a Competent Person could apply as with a commercial assay laboratory. At every step, the Competent Persons are relying on the valuator's opinions of the diamond market and their subjective view of diamond values."

Example 5. Where information has been obtained in relation to the applicable taxation considerations used in an economic analysis:

The Competent Persons have not independently reviewed the taxation as applied in the economic model, and have fully relied upon, and disclaim responsibility for, information derived from Company and specialist experts retained by the Company for this information through the following documents:

- *Author name, date: Document Title: name of firm who authored the report and who the report was prepared for, report date, and number of pages. [repeat for each report relied upon]*

This information is used in Sections 21 and 22 of the Summary Technical Report.

APPENDIX G
CRIRSCO Template-Compliant Standards, Codes, and Guides

Country/Region	Reporting Organization	Name	Date	Website
World-wide	Committee for Mineral Reserves International Reporting Standards (CRIRSCO).	International Reporting Template for the public reporting of Exploration Results, Mineral Resources and Mineral Reserves.	2013	www.CRIRSCO.com.
Australasia	Joint Ore Reserve Committee of AusIMM, AIG, Minerals Council of Australia (JORC).	Australasian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves.	2012	www.JORC.org.
Brazil	Brazilian Commission of Resources and Reserves.	The CBRR Guide for Reporting Exploration Results, Mineral Resources and Mineral Reserves.	2015	www.cbrr.org.br.
Canada	Canadian Institute of Mining, Metallurgy and Petroleum (CIM).	CIM Definition Standards - for Mineral Resources and Mineral Reserves.	2014	www.cim.org.
Chile	Institution of Mining Engineers of Chile (IIMCh).	Code for the Certification of Exploration Prospects, Mineral Resources and Reserves.	2014	www.CRIRSCO.com.
Europe	Pan-European Resources and Reserves Committee (PERC).	Pan-European Standard for Reporting Exploration Results, Mineral Resources and Reserves.	2013	www.percstandard.eu.
Kazakhstan	Kazakhstani Association for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves.	Kazakhstan Code for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves.	2016	www.CRIRSCO.com.
Mongolia	Mongolian Professional Institute of Geology and Mining.	Mongolian Code for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves.	2014	www.CRIRSCO.com.

Country/Region	Reporting Organization	Name	Date	Website
Russia	The Russian Society of Subsoil Use Experts (OERN).	Russian Code for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves (NAEN Code).	2013	www.CRIRSCO.com.
South Africa	SAMCODES Standards Committee.	South African Code for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves.	2016	www.samcode.co.za.
United States	Society for Mining, Metallurgy and Exploration (SME).	The SME Guide for Reporting Exploration Results, Mineral Resources, and Mineral Reserves.	2017	www.smenet.org.

APPENDIX H
History of the SME Guide

In 1981, the U.S. Securities and Exchange Commission (SEC) first published disclosure standards for U.S. mining companies that were eventually designated as Industry Guide 7. However, these disclosure standards did not include detailed guidelines for the disclosure of geology, mining engineering, processing, or other factors required to support estimates of Mineral Reserves as defined in Industry Guide 7. In 1988, at the request of members of the Society for Mining, Metallurgy, and Exploration, Inc. (SME), the President of SME formed "Working Party #79, Ore Reserve Definition," with the mission to develop guidelines for the public reporting of Exploration Information, Mineral Resources, and Mineral Reserves. SME first published those guidelines in the April 1991 issue of *Mining Engineering*, and then as a standalone document entitled *A Guide for Reporting Exploration Information, Resources, and Reserves* in January 1992 (the 1992 SME Guide). Shortly thereafter the SEC staff began recommending use of the 1992 SME Guide for guidance on technical information required to support estimates of Mineral Reserves. In 1996, Working Party #79 was renamed the Resources and Reserves Committee and became a standing committee of SME.

In 1994, the Council of Mining and Metallurgical Institutions (CMMI) started a concerted international effort to create a set of international definitions for reporting Mineral Resources and Mineral Reserves. An ad-hoc International Definitions Group was formed, with representatives from mining and metallurgical institutions from the United States (SME), Australia (AusIMM), Canada (CIM), the United Kingdom (IMM) and South Africa (SAIMM). A major breakthrough came on October 18, 1997 when the CMMI International Definitions Group met in Denver, Colorado and reached a provisional agreement (the Denver Accord) on definitions of Mineral Resources and Mineral Reserves. Concurrently, and since 1992, the United Nations Economic Commission for Europe (UN-ECE) was developing an international framework classification for Mineral Resources and Mineral Reserves. The first edition was published in 1997. Starting in October 1998, joint meetings were held in Geneva between the CMMI International Definitions Group and the UN-ECE Task Force. These meetings resulted in agreement to incorporate the CMMI definitions into the UN Framework Classification.

In 2002, the Combined Reserves International Reporting Standards Committee (subsequently renamed the Committee for Mineral Reserves International Reporting Standards or CRIRSCO) was formed, replacing the CMMI International Definitions Group with the mission to continue coordination between member countries of the development of international standards for the definition and reporting of Exploration Information, Mineral Resources, and Mineral Reserves. Chile joined CRIRSCO in 2002 and developed the first non-English reporting system that follows the international definitions.

The international resources and reserves definitions or their precursors were accepted as part of national reporting systems by the regulatory agencies of Australia (1989), South Africa (2000), Canada (2001), and the United Kingdom (2001). These definitions were formally adopted by the United Nations in 1999 for the categories common to the two classifications (CRIRSCO and UNFC-1999). Following a cooperation agreement between the SPE, CRIRSCO and the Expert Group on Reserve Classification (EGRC) of the UN-ECE, the CRIRSCO definitions were slightly modified to suit the broader scope of the UNFC and were then included in a 2009 revision of the

United Nations Framework Classification (UNFC-2009). However, the equivalence between the definition categories common to the two classifications remained the same as before.

In 2007, the Government of Chile approved a reporting system that includes these definitions. In 2008, the Pan-European Standard was issued by the Pan-European Resources and Reserves Reporting Committee (PERC), and in 2011 the Russian Code was issued by the National Association for Subsoil Examination (NAEN). In 2014, the Mongolian Resource Code was issued by the Mongolian Professional Institute of Geosciences and Mining. In 2015, the Brazilian Commission for Resources and Reserves issued the CBRR Guide for Reporting Exploration Results, Mineral Resources and Mineral Reserves. In 2016, the Kazakhstani Association for Public Reporting of Exploration Results, issued the Kazakhstan Code for the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves.

The 1992 SME Guide was updated in 1999 when the requirement was introduced that the reporting of Mineral Resources and Mineral Reserves should be made by a Competent Person. The SME Guide was updated again in 2007 to reflect changes made by the 2006 CRIRSCO Template. In 2011 and 2012 responding to changes in some national reporting systems, updated standard definitions were proposed and adopted by CRIRSCO, with the understanding that National Reporting Organizations (NROs) could provide guidance reflecting technical and regulatory practice in their jurisdictions.

In 2012, SME petitioned the SEC to update its Industry Guide 7 using the SME Guide as a model. In 2014, the SEC recognized the need to update the disclosure guidance set forth in Industry Guide 7 to better align it align with CRIRSCO and other international standards international standards. The SME Guide was updated in 2014 to incorporate the 2012 CRIRSCO core definitions and to reflect practice within the United States.

In 2017, Industry Guide 7 was updated to incorporate CRIRSCO core definitions and to explicitly recognize the SME Guide as a source of additional guidance for SEC filers. The new Industry Guide 7 seeks to establish uniformity and comparability among SEC filers by requiring estimates of Mineral Resources and Mineral Reserves to be done in accordance with the SME Guide or another CRIRSCO International Reporting Template-compliant reporting system. If non-CRIRSCO International Reporting Template-compliant standards are used, the estimates must be reconciled to the SME Guide, including an explanation of any differences between the estimates under the reporting systems that are material to the reconciliation.

A list of CRIRSCO Template-compliant reporting systems is contained in Appendix G of the SME Guide.