

**REGULATION 43-101 RESPECTING  
STANDARDS OF DISCLOSURE FOR MINERAL PROJECTS**

Securities Act

(R.S.Q., c. V-1.1, s. 331.1, par. (1), (3), (6), (8), (11) and (34))

**PART 1 DEFINITIONS AND INTERPRETATION**

**1.1 Definitions**

In this Regulation

“adjacent property” means a property

- (a) in which the issuer does not have an interest;
- (b) that has a boundary reasonably proximate to the property being reported on;  
and
- (c) that has geological characteristics similar to those of the property being reported on;

“data verification” means the process of confirming that data has been generated with proper procedures, has been accurately transcribed from the original source and is suitable to be used;

“development property” means a property that is being prepared for mineral production and for which economic viability has been demonstrated by a feasibility study;

“disclosure” means any oral statement or written disclosure made by or on behalf of an issuer and intended to be, or reasonably likely to be, made available to the public in a jurisdiction of Canada, whether or not filed under securities legislation, but does not include written disclosure that is made available to the public only by reason of having been filed with a government or agency of government pursuant to a requirement of law other than securities legislation;

“early stage exploration property” means a property that has

- (a) no current mineral resources or mineral reserves defined; and
- (b) no drilling or trenching proposed;

in a technical report being filed in a local jurisdiction;

“exploration information” means geological, geophysical, geochemical, sampling, drilling, trenching, analytical testing, assaying, mineralogical, metallurgical and other similar information concerning a particular property that is derived from activities undertaken to locate, investigate, define or delineate a mineral prospect or mineral deposit;

“feasibility study” means a comprehensive study of a mineral deposit in which all geological, engineering, legal, operating, economic, social, environmental and other relevant factors are considered in sufficient detail that it could reasonably serve as the basis for a final decision by a financial institution to finance the development of the deposit for mineral production;

“historical estimate” means an estimate of mineral resources or mineral reserves prepared prior to February 1, 2001;

“IMMM Reporting Code” means the classification system and definitions of mineral resources and mineral reserves approved by The Institution of Materials, Minerals, and Mining in the United Kingdom, as amended;

“JORC Code” means the Australasian Code for Reporting of Mineral Resources and Ore Reserves prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Mineral Council of Australia, as amended;

“mineral project” means any exploration, development or production activity, including a royalty interest or similar interest in these activities, in respect of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals;

“Regulation 44-101” means Regulation 44-101 respecting Short Form Prospectus Distributions;

“preliminary assessment” means a study that includes an economic analysis of the potential viability of mineral resources taken at an early stage of the project prior to the completion of a preliminary feasibility study;

“preliminary feasibility study” and “pre-feasibility study” each mean a comprehensive study of the viability of a mineral project that has advanced to a stage where the mining method, in the case of underground mining, or the pit configuration, in the case of an open pit, has been established and an effective method of mineral processing has been determined, and includes a financial analysis based on reasonable assumptions of technical, engineering, legal, operating, economic, social, and environmental factors and the evaluation of other relevant factors which are sufficient for a qualified person, acting reasonably, to determine if all or part of the mineral resource may be classified as a mineral reserve;

“producing issuer” means an issuer with annual audited financial statements that disclose

(a) gross revenues, derived from mining operations, of at least \$30 million for the issuer’s most recently completed financial year; and

(b) gross revenues, derived from mining operations, of at least \$90 million in the aggregate for the issuer’s three most recently completed financial years;

“professional association” means a self-regulatory organization of engineers, geoscientists or both engineers and geoscientists that

(a) is

(i) given authority or recognition by statute in a jurisdiction of Canada, or

(ii) a foreign association listed in Appendix A;

(b) admits individuals on the basis of their academic qualifications and experience;

(c) requires compliance with the professional standards of competence and ethics established by the organization; and

(d) has disciplinary powers, including the power to suspend or expel a member;

“qualified person” means an individual who

(e) is an engineer or geoscientist with at least five years of experience in mineral exploration, mine development or operation or mineral project assessment, or any combination of these;

(f) has experience relevant to the subject matter of the mineral project and the technical report; and

(g) is in good standing with a professional association and, in the case of a foreign association listed in Appendix A, has the corresponding designation in Appendix A;

“quantity” means either tonnage or volume, depending on which term is the standard in the mining industry for the type of mineral;

“SAMREC Code” means the South African Code for Reporting of Mineral Resources and Mineral Reserves prepared by the South African Mineral Committee (SAMREC) under the auspices of the South African Institute of Mining and Metallurgy (SAIMM), as amended;

“SEC Industry Guide 7” means the mining industry guide entitled “Description of Property by Issuers Engaged or to be Engaged in Significant Mining Operations” contained in the Securities Act Industry Guides published by the United States Securities and Exchange Commission, as amended;

“technical report” means a report prepared and filed in accordance with this Regulation and Form 43-101F1 Technical Report that does not omit any material scientific and technical information in respect of the subject property as of the date of the filing of the report; and

“written disclosure” includes any writing, picture, map or other printed representation whether produced, stored or disseminated on paper or electronically, including websites.

### **1.1 Mineral Resource**

In this Regulation, the terms “mineral resource”, “inferred mineral resource”, “indicated mineral resource” and “measured mineral resource” have the meanings ascribed to those terms by the Canadian Institute of Mining, Metallurgy and Petroleum, as the CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by CIM Council, as those definitions may be amended.

### **1.2 Mineral Reserve**

In this Regulation, the terms “mineral reserve”, “probable mineral reserve” and “proven mineral reserve” have the meanings ascribed to those terms by the Canadian Institute of Mining, Metallurgy and Petroleum, as the CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by CIM Council, as those definitions may be amended.

### **1.3 Independence**

In this Regulation, a qualified person is independent of an issuer if there is no circumstance that could, in the opinion of a reasonable person aware of all relevant facts, interfere with the qualified person’s judgment regarding the preparation of the technical report.

## **PART 2      REQUIREMENTS APPLICABLE TO ALL DISCLOSURE**

### **2.1      Requirements Applicable to All Disclosure**

All disclosure of scientific or technical information made by an issuer, including disclosure of a mineral resource or mineral reserve, concerning a mineral project on a property material to the issuer must be based upon information prepared by or under the supervision of a qualified person.

### **2.2      All Disclosure of Mineral Resources or Mineral Reserves**

An issuer must not disclose any information about a mineral resource or mineral reserve unless the disclosure

(a) uses only the applicable mineral resource and mineral reserve categories set out in sections 1.2 and 1.3;

(b) reports each category of mineral resources and mineral reserves separately, and states the extent, if any, to which mineral reserves are included in total mineral resources;

(c) does not add inferred mineral resources to the other categories of mineral resources; and

(d) states the grade or quality and the quantity for each category of the mineral resources and mineral reserves if the quantity of contained metal or mineral is included in the disclosure.

### **2.3      Prohibited Disclosure**

(1) An issuer must not make any disclosure of the

(a) quantity, grade, or metal or mineral content of a deposit that has not been categorized as an inferred mineral resource, an indicated mineral resource, a measured mineral resource, a probable mineral reserve or a proven mineral reserve; or

(b) results of an economic analysis that includes inferred mineral resources.

(2) Despite paragraph (1)(a), an issuer may disclose in writing the potential quantity and grade, expressed as ranges, of a potential mineral deposit that is to be the target of further exploration if the disclosure

(a) includes a 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 target being delineated as a mineral resource; and

(b) states the basis on which the disclosed potential quantity and grade has been determined.

(3) Despite paragraph (1)(b), an issuer may disclose a preliminary assessment that includes inferred mineral resources if

(a) the results of the preliminary assessment are a material change or a material fact with respect to the issuer; and

(b) the disclosure

(i) includes a statement that the preliminary assessment is preliminary in nature, that 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 preliminary assessment will be realized; and

(ii) states the basis for the preliminary assessment and any qualifications and assumptions made by the qualified person.

(4) An issuer must not use the term preliminary feasibility study, pre-feasibility study or feasibility study when referring to a study unless the study satisfies the criteria set out in the definition of the applicable term in section 1.1.

## **2.4 Disclosure of Historical Estimates**

Despite section 2.2, an issuer may disclose an historical estimate using the historical terminology if the disclosure

- (a) identifies the source and date of the historical estimate;
- (b) comments on the relevance and reliability of the historical estimate;
- (c) states whether the historical estimate uses categories other than the ones set out in sections 1.2 and 1.3 and, if so, includes an explanation of the differences; and
- (d) includes any more recent estimates or data available to the issuer.

## **PART 3 ADDITIONAL REQUIREMENTS FOR WRITTEN DISCLOSURE**

### **3.1 Written Disclosure to Include Name of Qualified Person**

If an issuer discloses in writing scientific or technical information about a mineral project on a property material to the issuer, the issuer must include in the written disclosure

- (a) the name; and
- (b) the relationship to the issuer

of the qualified person who prepared or supervised the preparation of the information that forms the basis for the written disclosure.

### **3.2 Written Disclosure to Include Data Verification**

Subject to section 3.5, if an issuer discloses in writing scientific or technical information about a mineral project on a property material to the issuer, the issuer must include in the written disclosure

- (a) a statement whether a qualified person has verified the data disclosed, including sampling, analytical and test data underlying the information or opinions contained in the written disclosure;
- (b) a description of how the data was verified and any limitations on the verification process; and
- (c) an explanation of any failure to verify the data.

### **3.3 Requirements Applicable to Written Disclosure of Exploration Information**

(1) Except as provided in section 3.5, if an issuer discloses in writing exploration information about a mineral project on a property material to the issuer, the issuer must include in the written disclosure

(a) the results, or a summary of the material results, of surveys and investigations regarding the property;

(b) a summary of the interpretation of the exploration information; and

(c) a description of the quality assurance program and quality control measures applied during the execution of the work being reported on.

(2) Except as provided in section 3.5, if an issuer discloses in writing sample, analytical or test results on a property material to the issuer, the issuer must include in the written disclosure

(a) a summary description of the geology, mineral occurrences and nature of mineralization found;

(b) a summary description of rock types, geological controls and dimensions of mineralized zones, and the identification of any significantly higher grade intervals within a lower grade intersection;

(c) the location, number, type, nature and spacing or density of the samples collected and the location and dimensions of the area sampled;

(d) any drilling, sampling, recovery or other factors that could materially affect the accuracy or reliability of the data referred to in this subsection;

(e) a summary description of the type of analytical or testing procedures utilized, sample size, the name and location of each analytical or testing laboratory used, and any relationship of the laboratory to the issuer; and

(f) a summary of the relevant analytical values, widths and, to the extent known to the issuer, the true widths of the mineralized zone.

### **3.4 Requirements Applicable to Written Disclosure of Mineral Resources and Mineral Reserves**

If an issuer discloses in writing mineral resources or mineral reserves on a property material to the issuer, the issuer must include in the written disclosure

(a) the effective date of each estimate of mineral resources and mineral reserves;

(b) details of quantity and grade or quality of each category of mineral resources and mineral reserves;

(c) details of the key assumptions, parameters and methods used to estimate the mineral resources and mineral reserves;

(d) a general discussion of the extent to which the estimate of mineral resources or mineral reserves may be materially affected by any known environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues; and

(e) a statement that mineral resources that are not mineral reserves do not have demonstrated economic viability, if the results of an economic analysis of mineral resources are included in the disclosure.

### **3.5 Exception for Written Disclosure Already Filed**

Sections 3.2 and 3.3 and paragraphs 3.4 (a), (c) and (d) do not apply if the issuer includes in the written disclosure a reference to the title and date of a previously filed document that complies with those requirements.

## **PART 4 OBLIGATION TO FILE A TECHNICAL REPORT**

### **4.1 Obligation to File a Technical Report Upon Becoming a Reporting Issuer**

(1) Upon becoming a reporting issuer in a jurisdiction of Canada an issuer must file in that jurisdiction a technical report for a mineral project on each property material to the issuer.

(2) Subsection (1) does not apply if the issuer is a reporting issuer in a jurisdiction of Canada and subsequently becomes a reporting issuer in another jurisdiction of Canada.

### **4.2 Obligation to File a Technical Report in Connection with Certain Written Disclosure About Mineral Projects on Material Properties**

(1) An issuer must file a technical report to support scientific or technical information in any of the following documents filed or made available to the public in a jurisdiction of Canada describing a mineral project on a property material to the issuer, or in the case of paragraph (c) below, the resulting issuer:

(a) a preliminary prospectus, other than a preliminary short form prospectus filed in accordance with Regulation 44-101;

(b) a preliminary short form prospectus filed in accordance with Regulation 44-101 that includes material scientific or technical information about a mineral project on a property material to the issuer but not contained in

(i) an annual information form, prospectus, or material change report filed before February 1, 2001; or

(ii) a previously filed technical report;

(c) an information or proxy circular concerning a direct or indirect acquisition of a mineral property where the issuer or resulting issuer issues securities as consideration;

(d) an offering memorandum, other than an offering memorandum delivered solely to accredited investors as defined under securities legislation;

(e) for a reporting issuer, a rights offering circular;

(f) an annual information form that includes material scientific or technical information about a mineral project on a property material to the issuer but not contained in

(i) an annual information form, prospectus, or material change report filed before February 1, 2001; or

(ii) a previously filed technical report;

(g) a valuation required to be prepared and filed under securities legislation;

(h) an offering document that complies with and is filed in accordance with the TSX Venture Exchange policy;

(i) a take-over bid circular that discloses a preliminary assessment or mineral resources or mineral reserves on a property material to the offeror if securities of the offeror are being offered in exchange on the take-over bid; and

(j) a news release or directors' circular that contains

(i) first time disclosure of a preliminary assessment or mineral resources or mineral reserves on a property material to the issuer that constitutes a material change in respect of the affairs of the issuer; or

(ii) a change in a preliminary assessment or in mineral resources or mineral reserves from the most recently filed technical report that constitutes a material change in respect of the affairs of the issuer.

(2) Subsection (1) does not apply for disclosure of an historical estimate in a document referred to in paragraph (j) of that subsection if the disclosure

(a) is in accordance with section 2.4; and

(b) includes a statement that

(i) a qualified person has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves;

(ii) the issuer is not treating the historical estimate as current mineral resources or mineral reserves as defined in sections 1.2 and 1.3 of this Regulation; and

(iii) the historical estimate should not be relied upon.

(3) If there has been a material change to the information in the technical report filed under paragraph (a) or (b) of subsection (1) before the filing of the final version of a prospectus or short form prospectus, the issuer must file an updated technical report or an addendum to the technical report with the final version of the prospectus or short form prospectus.

(4) Subject to subsections (5), (6), and (7), the technical report referred to in subsection (1) must be filed not later than the time the document listed in subsection (1) that it supports is filed or made available to the public.

(5) Despite subsection (4), a technical report about mineral resources or mineral reserves that supports a news release must

(a) be filed not later than 45 days after the news release; and

(b) if there are any material differences in the mineral resources or mineral reserves between the technical report filed and the news release, be accompanied by a news release that reconciles those differences.

(6) Despite subsection (4), if a property referred to in an annual information form first becomes material to the issuer less than 30 days before the filing deadline for the annual information form, the issuer must file the technical report within 45 days of the date that the property first became material to the issuer.

(7) Despite subsection (4), a technical report that supports a directors' circular must be filed not less than 3 business days prior to the expiry of the take-over bid.

(8) Subsection (1) does not apply if

(a) the issuer has a technical report filed that supports the scientific or technical information contained in the disclosure and there has been no material change in the



scientific and technical information concerning the property since the date of the filing of the technical report; and

(b) the issuer files an updated certificate in accordance with subsection 8.1 and consent in accordance with subsection 8.3 of each qualified person who has been responsible for preparing or supervising the preparation of each portion of the technical report.

#### **4.3 Required Form of Technical Report**

A technical report that is required to be filed under this Part must be prepared in accordance with Form 43-101F1.

### **PART 5 AUTHOR OF TECHNICAL REPORT**

#### **5.1 Prepared by a Qualified Person**

A technical report must be prepared by or under the supervision of one or more qualified persons.

#### **5.2 Execution of Technical Report**

A technical report must be dated, signed and, if the qualified person has a seal, sealed by

(a) each qualified person who is responsible for preparing or supervising the preparation of all or part of the report; or

(b) a person or company whose principal business is providing engineering or geoscientific services if each qualified person responsible for preparing or supervising the preparation of all or part of the report is an employee, officer or director of that person or company.

#### **5.3 Independent Technical Report**

(1) Subject to subsection (2), a technical report required under any of the following provisions of this Regulation must be prepared by or under the supervision of a qualified person that is, at the date of the technical report, independent of the issuer:

(a) section 4.1;

(b) paragraphs (a) and (g) of subsection 4.2(1); or

(c) paragraphs (b), (c), (d), (e), (f), (h), (i), (j) of subsection 4.2(1) if the document discloses

(i) for the first time a preliminary assessment or mineral resources or mineral reserves on a property material to the issuer, or

(ii) a 100 percent or greater change, from the most recently filed technical report prepared by a qualified person who is independent of the issuer, in total mineral resources or total mineral reserves on a property material to the issuer.

(2) A technical report required to be filed by a producing issuer under paragraph (c) of subsection (1) is not required to be prepared by or under the supervision of an independent qualified person.

(3) A technical report required to be filed by an issuer that is or has contracted to become a joint venture participant, concerning a property which is or will be the subject of the joint venture's activities, is not required to be prepared by or under the supervision of

an independent qualified person if the qualified person preparing or supervising the preparation of the report relies on scientific and technical information prepared by or under the supervision of a qualified person that is an employee or consultant of a producing issuer that is a participant in the joint venture.

## **PART 6 PREPARATION OF TECHNICAL REPORT**

### **6.1 The Technical Report**

A technical report must be prepared on the basis of all available data relevant to the disclosure that it supports.

### **6.2 Current Personal Inspection**

(1) Subject to subsections (2) and (3), before an issuer files a technical report, the issuer must have at least one qualified person who is responsible for preparing or supervising the preparation of all or part of the technical report complete a current inspection on the property that is the subject of the technical report.

(2) Subsection (1) does not apply to an issuer provided that

(a) the property that is the subject of the technical report is an early stage exploration property;

(b) seasonal weather conditions prevent a qualified person from accessing any part of the property or obtaining beneficial information from it; and

(c) the issuer discloses in the technical report, and in the disclosure that the technical report supports, that a personal inspection by a qualified person was not conducted, the reasons why, and the intended time frame to complete the personal inspection.

(3) If an issuer relies on subsection (2), the issuer must

(a) as soon as practical, have at least one qualified person who is responsible for preparing or supervising the preparation of all or part of the technical report complete a current inspection on the property that is the subject of the technical report; and

(b) promptly file a technical report and the certificates and consents required under Part 8 of this Regulation.

### **6.3 Maintenance of Records**

An issuer must keep for 7 years copies of assay and other analytical certificates, drill logs and other information referenced in the technical report or used as a basis for the technical report.

### **6.4 Limitation on Disclaimers**

An issuer must not file a technical report that contains a disclaimer by any qualified person responsible for preparing or supervising the preparation of the report that

(a) disclaims responsibility for, or reliance on, that portion of the report the qualified person prepared or supervised the preparation of; or

(b) limits the use or publication of the report in a manner that interferes with the issuer's obligation to reproduce the report by filing it on SEDAR.

## **PART 7 USE OF FOREIGN CODE**

### **7.1 Use of Foreign Code**

Despite section 2.2, an issuer that

- (a) is incorporated or organized in a foreign jurisdiction; or
- (b) is incorporated or organized under the laws of Canada or a jurisdiction of Canada, for its properties located in a foreign jurisdiction;

may make disclosure and file a technical report that utilizes the mineral resource and mineral reserve categories of the JORC Code, the SEC Industry Guide 7, the IMMM Reporting Code or the SAMREC Code if a reconciliation to the mineral resource and mineral reserve categories set out in sections 1.2 and 1.3 is disclosed in the technical report.

## **PART 8 CERTIFICATES AND CONSENTS OF QUALIFIED PERSONS FOR TECHNICAL REPORTS**

### **8.1 Certificates of Qualified Persons**

(1) An issuer must, when filing a technical report, file a certificate of each qualified person responsible for preparing or supervising the preparation of each portion of the technical report and the certificate must be dated, signed and, if the signatory has a seal, sealed.

(2) A certificate under subsection (1) must state

- (a) the name, address and occupation of the qualified person;
- (b) the title and date of the technical report to which the certificate applies;
- (c) the qualified person's qualifications, including a brief summary of relevant experience, the name of all professional associations to which the qualified person belongs, and that the qualified person is a "qualified person" for purposes of this Regulation;
- (d) the date and duration of the qualified person's most recent personal inspection of each property, if applicable;
- (e) the item or items of the technical report for which the qualified person is responsible;
- (f) whether the qualified person is independent of the issuer as described in section 1.4;
- (g) what prior involvement, if any, the qualified person has had with the property that is the subject of the technical report;
- (h) that the qualified person has read this Regulation and the technical report has been prepared in compliance with this Regulation; and
- (i) that, as of the date of the certificate, to the best of the qualified person's knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

### **8.2 Addressed to Issuer**

All technical reports must be addressed to the issuer.

### **8.3 Consents of Qualified Persons**

An issuer must, when filing a technical report, file a statement of each qualified person responsible for preparing or supervising the preparation of each portion of the technical report, addressed to the securities regulatory authority, dated, and signed by the qualified person

(a) consenting to the public filing of the technical report and to extracts from, or a summary of, the technical report in the written disclosure being filed; and

(b) confirming that the qualified person has read the written disclosure being filed and that it fairly and accurately represents the information in the technical report that supports the disclosure.

## **PART 9 EXEMPTIONS**

### **9.1 Authority to Grant Exemptions**

(1) The regulator or the securities regulatory authority may, on application, grant an exemption from this Regulation, in whole or in part, subject to such conditions or restrictions as may be imposed in the exemption in response to an application.

(2) Despite subsection (1), in Ontario, only the regulator may grant such an exemption.

(3) Except in Ontario, an exemption referred to in subsection (1) is granted under the statute referred to in Appendix B of National Instrument 14-101 *Definitions* opposite the name of the local jurisdiction.

### **9.2 Limited Exemption for Royalty Interests or Similar Interests**

(1) Subject to subsection (2), an issuer that has only a royalty interest or similar interest in a mineral project and is required to file a technical report in accordance with section 4.3 is not required to

(a) comply with section 6.2; and

(b) complete those items under Form 43-101F1 that require data verification, inspection of documents, or personal inspection of the property to complete those items.

(2) Paragraphs (1)(a) and (b) only apply if the issuer

(a) has requested but has not received access to the necessary data from the operating company and is not able to obtain the necessary information from the public domain;

(b) under Item 3 of Form 43-101F1, states the issuer has requested but has not received access to the necessary data from the operating company and is not able to obtain the necessary information from the public domain and describes the content referred to under each item of Form 43-101F1 that the issuer did not complete; and

(c) includes in all scientific and technical disclosure a statement that the issuer has an exemption from completing certain items under Form 43-101F1 in the technical report required to be filed and includes a reference to the title and date of that technical report.

### **9.3 Exemption for Certain Types of Filings**

This Regulation does not apply if the only reason an issuer files written disclosure of scientific or technical information is to comply with the requirement under securities

legislation to file a copy of a record or disclosure material that was filed with a securities commission, exchange or regulatory authority in another jurisdiction.

**PART 10 REPEAL OF FORMER REGULATION AND EFFECTIVE DATE**

**10.1** This Regulation replaces Regulation 43-101 respecting Standards of Disclosure for Mineral Projects that came into force on February 1, 2001.

**10.2 Effective date**

This Regulation comes into force on December 30, 2005.

**Appendix A**

**Recognized Foreign Associations and Designations**

<b>Foreign Association</b>	<b>Designation</b>
American Institute of Professional Geologists (AIPG)	Certified Professional Geologist
Any state in the United States of America	Licensed or certified as a professional engineer
Mining and Metallurgical Society of America (MMSA)	Qualified Professional
European Federation of Geologists (EFG)	European Geologist
Australasian Institute of Mining and Metallurgy (AusIMM)	Fellow or member
Institute of Materials, Minerals and Mining (IMMM)	Fellow or professional member
Australian Institute of Geoscientists (AIG)	Fellow or member
South African Institute of Mining and Metallurgy (SAIMM)	Fellow
South African Council for Natural Scientific Professions (SACNASP)	Professional Natural Scientist
Institute of Geologists of Ireland (IGI)	Professional Member
Geological Society of London (GSL)	Chartered Geologist
National Association of State Boards of Geology (ASBOG)	Licensed or certified in: Alabama, Arizona, Arkansas, California, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Kansas, Kentucky, Maine, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, North Carolina, Oregon, Pennsylvania, Puerto Rico, South Carolina, Texas, Utah, Virginia, Washington, Wisconsin or Wyoming

**FORM 43-101F1  
TECHNICAL REPORT**

*INSTRUCTIONS*

(1) *The objective of the technical report is to provide a summary of scientific and technical information concerning mineral exploration, development and production activities on a mineral property that is material to an issuer. This Form sets out specific requirements for the preparation and contents of a technical report.*

(2) *Terms used in this Form that are defined or interpreted in Regulation 43-101 respecting Standards of Disclosure for Mineral Projects (the “Regulation”) will bear that definition or interpretation. In addition, a general definition regulation has been adopted as National Instrument 14-101 Definitions that contains definitions of certain terms used in more than one regulation. Readers of this Form should review both of these regulations for defined terms.*

(3) *The qualified person preparing the technical report must use all of the headings of the items in this Form and may create sub-headings. If unique or infrequently used technical terms are required, clear and concise explanations must be included.*

(4) *No disclosure need be given in respect of inapplicable items and, unless otherwise required by this Form, negative answers to items may be omitted. Disclosure included under one heading is not required to be repeated under another heading.*

(5) *The technical report is not required to include the information required in Items 6 through 11 of this Form to the extent that the required information has been previously filed in a technical report for the property being reported on, the previous technical report is referred to in the technical report and there has not been any material change in the information.*

(6) *The technical report for development properties and production properties may summarize the information required in the items of this Form, except for Item 25, provided that the summary includes the material information necessary to understand the project at its current stage of development or production.*

(7) *The technical report may only contain disclaimers that are in accordance with section 6.4 of the Regulation and Item 5 of this Form.*

**CONTENTS OF THE TECHNICAL REPORT**

**Item 1            Title Page**

Include a title page setting out the title of the technical report, the general location of the mineral project, the name and professional designation of each qualified person and the effective date of the technical report.

**Item 2            Table of Contents**

Provide a table of contents listing the contents of the technical report, including figures and tables.

**Item 3            Summary**

Provide a summary that briefly describes the property, its location, ownership, geology and mineralization, the exploration concept, the status of exploration, development and operations and the qualified person’s conclusions and recommendations.

#### **Item 4 Introduction**

Include a description of

- (a) who the technical report is prepared for;
- (b) the purpose for which the technical report was prepared;
- (c) the sources of information and data contained in the technical report or used in its preparation, with citations if applicable; and
- (d) the scope of the personal inspection on the property by each qualified person and author or, if applicable, the reason why a personal inspection has not been completed.

#### **Item 5 Reliance on Other Experts**

If a qualified person preparing or supervising the preparation of all or a portion of the technical report is relying on a report, opinion or statement of a legal or other expert, who is not a qualified person, for information concerning legal, environmental, political or other issues and factors relevant to the technical report, the qualified person may include a disclaimer of responsibility in which the qualified person identifies the report, opinion or statement relied upon, the maker of that report, opinion or statement, the extent of reliance and the portions of the technical report to which the disclaimer applies.

#### **Item 6 Property Description and Location**

To the extent applicable, with respect to each property reported on, describe

- (a) the area of the property in hectares or other appropriate units;
- (b) the location, reported by an easily recognizable geographic and grid location system;
- (c) the type of mineral tenure (eg. claim, license, lease) and the identifying name or number of each;
- (d) the nature and extent of the issuer's title to, or interest in, the property including surface rights, the obligations that must be met to retain the property, and the expiration date of claims, licences or other property tenure rights;
- (e) how the property boundaries were located;
- (f) the location of all known mineralized zones, mineral resources, mineral reserves and mine workings, existing tailing ponds, waste deposits and important natural features and improvements, relative to the outside property boundaries;
- (g) to the extent known, the terms of any royalties, back-in rights, payments or other agreements and encumbrances to which the property is subject;
- (h) to the extent known, all environmental liabilities to which the property is subject; and
- (i) to the extent known, the permits that must be acquired to conduct the work proposed for the property, and if the permits have been obtained.

#### **Item 7 Accessibility, Climate, Local Resources, Infrastructure and Physiography**

With respect to each property reported on, describe



- (a) topography, elevation and vegetation;
- (b) the means of access to the property;
- (c) the proximity of the property to a population centre, and the nature of transport;
- (d) to the extent relevant to the mineral project, the climate and the length of the operating season; and
- (e) to the extent relevant to the mineral project, the sufficiency of surface rights for mining operations, the availability and sources of power, water, mining personnel, potential tailings storage areas, potential waste disposal areas, heap leach pad areas and potential processing plant sites.

**Item 8 History**

To the extent known, with respect to each property reported on, describe

- (a) the prior ownership of the property and ownership changes;
- (b) the type, amount, quantity and general results of exploration and development work undertaken by any previous owners or operators;
- (c) historical mineral resource and mineral reserve estimates in accordance with section 2.4 of the Regulation, including the reliability of the historical estimates and whether the estimates are in accordance with the categories set out in sections 1.2 and 1.3 of the Regulation; and
- (d) any production from the property.

**Item 9 Geological Setting**

Include a concise description of the regional, local and property geology.

**Item 10 Deposit Types**

Describe the mineral deposit type(s) being investigated or being explored for and the geological model or concepts being applied in the investigation and on the basis of which the exploration program is planned.

**Item 11 Mineralization**

Describe the mineralized zones encountered on the property, the surrounding rock types and relevant geological controls, detailing length, width, depth and continuity, together with a description of the type, character and distribution of the mineralization.

**Item 12 Exploration**

Describe the nature and extent of all relevant exploration work conducted by, or on behalf of, the issuer on each property being reported on, including

- (a) results of surveys and investigations, and the procedures and parameters relating to the surveys and investigations;
- (b) an interpretation of the exploration information; and
- (c) a statement as to whether the surveys and investigations have been carried out by the issuer or by a contractor and, if the latter, identifying the contractor.

## INSTRUCTION

*If exploration results from previous operators are included, the qualified person or author must clearly identify the work conducted by, or on behalf of, the issuer.*

### **Item 13      Drilling**

Describe the type and extent of drilling including the procedures followed and a summary and interpretation of all results. The relationship between the sample length and the true thickness of the mineralization must be stated, if known, and if the orientation of the mineralization is unknown, state this.

### **Item 14      Sampling Method and Approach**

Provide

(a) a brief description of sampling methods and relevant details of location, number, type, nature and spacing or density of samples collected, and the size of the area covered;

(b) a description of any drilling, sampling or recovery factors that could materially impact the accuracy and reliability of the results;

(c) a discussion of the sample quality, including whether the samples are representative, and any factors that may have resulted in sample biases;

(d) a description of rock types, geological controls, widths of mineralized zones and other parameters used to establish the sampling interval and identification of any significantly higher grade intervals within a lower grade intersection; and

(e) a summary of relevant samples or sample composites with values and estimated true widths.

### **Item 15      Sample Preparation, Analyses and Security**

Describe sample preparation methods and quality control measures employed before dispatch of samples to an analytical or testing laboratory, the method or process of sample splitting and reduction, and the security measures taken to ensure the validity and integrity of samples taken. Include

(a) a statement whether any aspect of the sample preparation was conducted by an employee, officer, director or associate of the issuer;

(b) details regarding sample preparation, assaying and analytical procedures used, the name and location of the analytical or testing laboratories and whether the laboratories are certified by any standards association and the particulars of any certification;

(c) a summary of the nature and extent of all quality control measures employed and check assay and other check analytical and testing procedures utilized, including the results and corrective actions taken; and

(d) a statement of the author's opinion on the adequacy of sample preparation, security and analytical procedures.

### **Item 16      Data Verification**

Include

- (a) a discussion of quality control measures and data verification procedures applied;
- (b) a statement as to whether the qualified person has verified the data referred to or relied upon;
- (c) a discussion of the nature of and any limitations on such verification; and
- (d) the reasons for any failure to verify the data.

**Item 17 Adjacent Properties**

A technical report may include information concerning an adjacent property if

- (a) such information was publicly disclosed by the owner or operator of the adjacent property;
- (b) the source of the information is identified;
- (c) the technical report states that its qualified person has been unable to verify the information and that the information is not necessarily indicative of the mineralization on the property that is the subject of the technical report;
- (d) the technical report clearly distinguishes between mineralization on the adjacent property and mineralization on the property being reported on; and
- (e) if any historical estimates of resources or reserves are included in the technical report, they are disclosed in accordance with section 2.4 of the Regulation.

**Item 17 Mineral Processing and Metallurgical Testing**

If mineral processing or metallurgical testing analyses have been carried out, include the results of the testing, details of the testing and analytical procedures, and discuss whether the samples are representative.

**Item 18 Mineral Resource and Mineral Reserve Estimates**

A technical report disclosing mineral resources or mineral reserves must

- (a) use only the applicable mineral resource and mineral reserve categories set out in sections 1.2 and 1.3 of the Regulation;
- (b) report each category of mineral resources and mineral reserves separately and if both mineral resources and mineral reserves are disclosed, state the extent, if any, to which mineral reserves are included in total mineral resources;
- (c) not add inferred mineral resources to the other categories of mineral resources;
- (d) disclose the name, qualifications and relationship, if any, to the issuer of the qualified person who estimated mineral resources and mineral reserves;
- (e) include appropriate details of quantity and grade or quality for each category of mineral resources and mineral reserves;
- (f) include details of the key assumptions, parameters and methods used to estimate the mineral resources and mineral reserves;
- (g) include a general discussion on the extent to which the estimate of mineral resources and mineral reserves may be materially affected by any known environmental,

permitting, legal, title, taxation, socio-economic, marketing, political or other relevant issues;

(h) identify the extent to which the estimates of mineral resources and mineral reserves may be materially affected by mining, metallurgical, infrastructure and other relevant factors;

(i) use only indicated mineral resources, measured mineral resources, probable mineral reserves and proven mineral reserves when referring to mineral resources or mineral reserves in an economic analysis that is used in a preliminary feasibility study or a feasibility study of a mineral project;

(j) if inferred mineral resources are used in an economic analysis, state the required disclosure set out in subsection 2.3(3) of the Regulation;

(k) when the results of an economic analysis of mineral resources are reported, state “mineral resources that are not mineral reserves do not have demonstrated economic viability”;

(l) state the grade or quality, quantity and category of the mineral resources and mineral reserves if the quantity of contained metal or mineral is reported; and

(m) when the grade for a polymetallic mineral resource or mineral reserve is reported as metal equivalent, report the individual grade of each metal, and consider and report the recoveries, refinery costs and all other relevant conversion factors in addition to metal prices and the date and sources of such prices.

#### *INSTRUCTION*

*A statement of quantity and grade or quality is an estimate and should be rounded to reflect the fact that it is an approximation.*

#### **Item 19 Other Relevant Data and Information**

Include any additional information or explanation necessary to make the technical report understandable and not misleading.

#### **Item 20 Interpretation and Conclusions**

Summarize the results and interpretations of all field surveys, analytical and testing data and other relevant information. Discuss the adequacy of data density and the data reliability as well as any areas of uncertainty. A technical report concerning exploration information must include the conclusions of the qualified person. The qualified person must discuss whether the completed project met its original objectives.

#### **Item 21 Recommendations**

Provide particulars of the recommended work programs and a breakdown of costs for each phase. If successive phases of work are recommended, each phase must culminate in a decision point. The recommendations must not apply to more than two phases of work. The recommendations must state whether advancing to a subsequent phase is contingent on positive results in the previous phase.

#### **Item 22 References**

Include a detailed list of all references cited in the technical report.

### **Item 23      Date and Signature Page**

The technical report must have a signature page at the end, signed in accordance with section 5.2 of the Regulation. The effective date of the technical report and date of signing must be on the signature page.

### **Item 24      Additional Requirements for Technical Reports on Development Properties and Production Properties**

Technical reports on development properties and production properties must include

(a) Mining Operations - information and assumptions concerning the mining method, metallurgical processes and production forecast;

(b) Recoverability - information concerning all test and operating results relating to the recoverability of the valuable component or commodity and amenability of the mineralization to the proposed processing methods;

(c) Markets - information concerning the markets for the issuer's production and the nature and material terms of any agency relationships;

(d) Contracts - a discussion of whether the terms of mining, concentrating, smelting, refining, transportation, handling, sales and hedging and forward sales contracts or arrangements, rates or charges are within industry norms;

(e) Environmental Considerations - a discussion of bond posting, remediation and reclamation;

(f) Taxes - a description of the nature and rates of taxes, royalties and other government levies or interests applicable to the mineral project or to production, and to revenues or income from the mineral project;

(g) Capital and Operating Cost Estimates - capital and operating cost estimates, with the major components being set out in tabular form;

(h) Economic Analysis - an economic analysis with cash flow forecasts on an annual basis using proven mineral reserves and probable mineral reserves only, and sensitivity analyses with variants in metal prices, grade, capital and operating costs;

(i) Payback - a discussion of the payback period of capital with imputed or actual interest; and

(j) Mine Life - a discussion of the expected mine life and exploration potential.

### **Item 25      Illustrations**

(a) Technical reports must be illustrated by legible maps, plans and sections, which may be located in the appropriate part of the report. All technical reports must be accompanied by a location or index map and more detailed maps showing all important features described in the text. In addition, technical reports must include a compilation map outlining the general geology of the property and areas of historical exploration. The location of all known mineralization, anomalies, deposits, pit limits, plant sites, tailings storage areas, waste disposal areas and all other significant features must be shown relative to property boundaries. If information is used, from other sources, in preparing maps, drawings, or diagrams, disclose the source of the information.

(b) If adjacent or nearby properties have an important bearing on the potential of the property under consideration, their location and any mineralized structures common to two or more such properties must be shown on the maps.

(c) If the potential merit of a property is predicated on geophysical or geochemical results, maps showing the results of surveys and their interpretations must be included in the technical report.

(d) Maps must include a scale in bar form and an arrow indicating north.

*INSTRUCTION*

*Illustrations should be sufficiently summarized and simplified so that they are not oversized and are suitable for electronic filing.*