

PERC SUMMARY GUIDE

to
**Public Reporting
for Mineral Companies in Europe**

December 2022 (1st Edition)

The PERC SUMMARY GUIDE is not a substitute for the PERC Reporting Standard and any Competent Person preparing a Public Report must consult the full text of the PERC Reporting Standard at www.percstandard.org



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PERC SUMMARY GUIDE

1. Introduction

The Pan-European Reserves and Resources Reporting Committee's PERC SUMMARY GUIDE provides a valuable starting point to anyone seeking to understand the *Mineral raw materials*¹ industry. The PERC Reporting Standard sets out the required minimum standard and additional guidelines for the *Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves*².

The PERC SUMMARY GUIDE („Guide“) summarises the principles and standard definitions in the **PERC Reporting Standard 2021**. The Guide highlights the key aspects of *Public Reporting for Mineral Companies*, as an easy reference for both non-technical and expert users. The PERC SUMMARY GUIDE assists the reader in familiarising themselves with the sector's language, particularly the proper use of the terms *Exploration Results, Mineral Resources and Mineral Reserves*. The specialist minerals geologist, mining engineer, processing engineer, or any other interested person must fully understand these specific terms, when to use them and, more importantly, when not to use them.

The PERC SUMMARY GUIDE is based on the previously published '*IGI Summary Guide to Public Reporting*' (December 2021) prepared by the Institute of Geologists of Ireland (IGI).

2. Scope

The Pan-European Reserves and Resources Reporting Committee (PERC) is an association of six Europe-based Professional Organisations (PO). PERC was constituted to promote industry best practices in the *Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves* in Europe. In this context, PERC is responsible for managing the PERC Reporting Standard. PERC serves as the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) *Na-*

¹ *Raw Materials* are materials or substances used in the primary production or manufacturing of goods.

² Text in *Italics* represents the defined terms and other common reporting terminology used in the PERC Reporting Standard.

*tional Reporting Organisation (NRO)*³ for Europe, including countries of the European Union (EU), the European Free Trade Association (EFTA), and the United Kingdom (UK).

The PERC SUMMARY GUIDE has been prepared to provide the context and an overview of the regulatory framework for the preparation of *Public Reporting* of information on the size, quality and potential value of *Mineral Deposits by Competent Persons*. These *Competent Persons* are employed directly or indirectly by *Issuers*⁴ (*Mineral Companies or Reporting Entities*) with a beneficial interest in *Mineral Properties*.

The PERC SUMMARY GUIDE has been written primarily for persons working in the *Minerals Sector*, for investors or potential investors and their professional advisors, and for persons working for relevant regulatory or legislative authorities. However, the PERC SUMMARY GUIDE is **not** a substitute for the PERC Reporting Standard. Any *Competent Person* preparing a *Public Report* must comply with the full text of the **PERC Reporting Standard 2021**, see www.percstandard.org/perc-standard

3. Background

3.1 Securities Exchange and Market Regulation

To properly understand the context in which the standards for *Public Reporting by Minerals Companies* are required, it is necessary to understand how Stock Markets operate and the need for their regulation. Table A below describes some of the terms used in this context, with examples from the European *Minerals* sector.

The European Securities and Market Authority (ESMA) is an independent EU authority responsible for regulating the financial markets in EU countries. ESMA contributes to safeguarding the stabi-

³ A *NRO* is a member organisation of CRIRSCO and is responsible for producing and maintaining a country- or region-specific Mineral Reporting Standard compatible with the **International Reporting Template**.

⁴ An *Issuer* is a legal entity that develops, registers, and sells securities to raise funds for its operations and includes *Minerals Companies and Reporting Entities* that have a beneficial interest in *Mineral Properties*.

Table A: Key terms related to the operation of Financial Markets, showing examples from the European Minerals Sector and relevant Public Reporting aspects

Term	Description	Examples from the Minerals Sector	Relevant Aspects of Public Reporting
Competent Person's Report	A <i>Competent Person's Report (CPR)</i> is prepared as part of a Prospectus or Admission document for a <i>Minerals Company</i> in its <i>Initial Public Offering (IPO)</i> or to support other public fund-raising initiatives.	The <i>CPR(s)</i> are included in the Admission document of a <i>Company</i> seeking a listing on a <i>Securities Exchange</i> .	A <i>Competent Person</i> must prepare a <i>CPR</i> . Some Securities Exchanges may have specific requirements for the format and content of a <i>CPR</i> in their regulations.
Investor	An individual or entity that buys and sells securities	Retail investors; Investment Funds; Banks	Investors and potential investors rely on <i>the</i> information presented in <i>Public Reports</i> released by the <i>Issuer</i>
Issuer	An <i>Issuer</i> is a legal entity that develops, registers, and sells securities to raise funds for its operations	Mining and Exploration (<i>Mineral Companies</i>) are listed on the London Stock Exchange's (LSE) Main Market or Alternative Investment Market (AIM). <i>Mineral Companies</i> are listed on Euronext	
Market Regulator	An entity responsible for regulating the Market	The European Securities and Markets Authority (ESMA) in the EU and some other European countries; The Financial Conduct Authority (FCA) in the UK.	Securities Exchange and Market Regulations and Legislation
Operation	A <i>Mining and Mineral Processing operation</i> is a production facility to extract <i>Mineral Raw Materials</i> from the Earth	A <i>Mining operation</i> by any mining method, including quarrying, open-pit and open-pit mining, underground mining, solution mining, dredging, etc., and any associated <i>Mineral Processing operation</i> ,	<i>Public Reports</i> should contain sufficient information that describes all the activities related to the extraction of metals, Minerals, Gemstones, Industrial Minerals and Dimension Stone and Energy Minerals.
Project	<i>Mineral Projects</i> are the exploration, development or production activities (including royalty or similar interests)		
Property	An <i>Asset</i> or interest held by the <i>Issuer</i> which has a financial value	Mines owned and operated by <i>Companies</i> ; exploration licences and royalty interests controlled by a <i>Company</i>	<i>Public Reports</i> should contain sufficient information to allow investors or potential investors and their professional advisors to make an informed judgement on the property's value.
Prospectus	A <i>Company's</i> Prospectus is a formal legal document designed to provide information and details about an investment offering for sale to the public.	A <i>Company</i> files a Prospectus with its initial listing on a European Securities Exchange.	
Reporting Code or Standard	A document which specifies how <i>Public Reports</i> should be prepared	The PERC Reporting Standard 2021	The use of an appropriate Standard or Code is usually mandatory.
Reporting Standard Setter	An entity responsible for developing and maintaining Reporting Standards	PERC and the other CRIRSCO National Reporting Organisations	The CRIRSCO Standard Definitions; PERC
Security	A fungible and tradable financial instrument	Mining and Exploration Company shares; Corporate bonds.	The perceived value is influenced by the <i>Public Reports</i> released by the <i>Issuer</i> .
Securities Exchange / Stock Market	An entity that facilitates the trading of securities	London Stock Exchange (LSE), Euronext Paris.	Market announcements are an example of a <i>Public Report</i>

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lity of the EU's financial system by enhancing the protection of investors and potential investors and promoting stable and orderly financial markets. ESMA defines a **Mineral Company** as 'Companies with material *Mineral Projects*' comprising *Mineral Properties*, as defined by the International Mineral Valuation Committee (IMVAL), see www.imval.org

The Financial Conduct Authority (FCA) oversees the conduct of financial markets in the UK. The FCA defines a *Mineral Company* as a 'Company or Group' whose principal activity is, or is planned to be, the extraction of *Mineral Resources* (which may or may not include exploration for *Mineral Resources*)⁵, see www.handbook.fca.org.uk

An *Issuer* that does not explicitly meet the definition of a *Mineral Company*, but has material *Mineral Properties*, or holdings with *Mineral Properties* that are material to the *Issuer*, would also be obliged to report on the *Exploration Results*, *Mineral Resources* and *Mineral Reserves* associated with those *Assets*.

Issuers may rely on investors for financing the evaluation and development of a *Mineral Property*. Such investors or potential investors and their professional advisers must **not** be knowingly misled by any communication or publicity report issued by or on behalf of the *Issuer*.

3.2 International Reporting Standards

The development of international standards for *Public Reporting by Mineral Companies* arose in response to concerns from Market Regulators about the risks of investors, or potential investors, and their professional advisers being misinformed or misled. A review carried out in 1970 following the 'Poseidon Bubble', related to speculation in a *Mineral Company* with a nickel prospect in Australia, led to the development of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves or **JORC Code**. Similarly, the Bre-X Scandal, related to the fraudulent salting of gold samples from a property in Indonesia held by a Canadian Junior *Mineral Company*, led to the introduction of the Canadian National Instrument

⁵ The FCA definition of a *Mineral Company* is considered to be outdated, and the definition currently stated should more correctly refer to the exploration for *Mineral Resources* and the extraction of *Mineral Reserves* associated with *Mineral Properties*.

NI⁴³⁻¹⁰¹ legislation. Similar concerns in other countries with significant mining interests resulted in international cooperation in developing internationally agreed definitions for terms related to the assessment of *Mineral Properties* and *Mineral Projects*.

As mentioned previously, PERC is a member of CRIRSCO, an international grouping of representative organisations responsible for developing *Mineral Reporting Standards*. CRIRSCO has compiled a set of standard definitions and prepared an agreed **International Reporting Template** for developing *National Reporting Standards*. As of November 2022, there are fourteen NRO members listed on the CRIRSCO website, see www.crirSCO.com

A timeline showing the development and evolution of CRIRSCO is presented in Figure A.

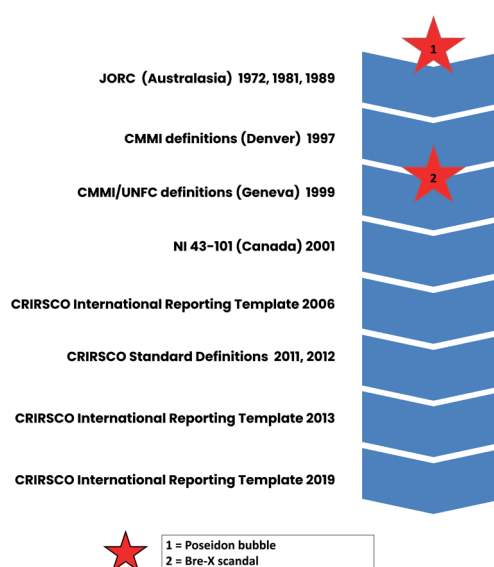


Figure A: Timeline showing the development of the CRIRSCO international reporting standard

To ensure that all investors or potential investors and their professional advisers have the same information presented clearly and transparently to reduce the risk of investors being misled, most Securities Exchanges on which *Mineral Companies* or *Companies* with material *Mineral Properties* are traded have introduced regulations to control the *Public Reporting of Exploration Results* (including *Exploration Targets*), *Mineral Resources* and *Mineral Reserves*. These regulations are presented in the *Reporting Standards*, which govern the reporting

terminology used to present information on *Exploration Results* (including *Exploration Targets*), *Mineral Resources* and *Mineral Reserves* in *Public Reports*.

3.3 The PERC Reporting Standard

PERC is the European NRO member of CRIRSCO. As part of the conditions of membership in CRIRSCO, PERC has developed and periodically updated the PERC Reporting Standard, based on the CRIRSCO International Reporting Template, for use by *Mineral Companies* when reporting on *Exploration Results*, *Mineral Resources* and *Mineral Reserves*.

The **PERC Reporting Standard 2021** sets out the minimum required standards and additional recommendations and guidelines for the *Public Reporting of Exploration Results*, *Mineral Resources* and *Mineral Reserves* [2.1]⁶.

The six-member organisations of PERC, namely:

- European Federation of Geologists (EFG);
- Fennoscandian Association for Metals and Minerals Professionals (FAMMP);
- Geological Society of London (GSL);
- Iberian Mining Engineers Board (IMEB);
- Institute of Geologists of Ireland (IGI); and
- Institute of Materials, Minerals, Mining (IOM3)

have adopted the PERC Reporting Standard for use by their members. Therefore, the terminology, use of terminology, and requirements of the PERC Reporting Standard are binding on their members, and the members of their constituent organisations, as in the case of the EFG.

A Mineral is any substance, extracted for value, occurring naturally in or on the Earth, in or under water or in tailings, residues or stockpiles, having been formed by or subjected to a geological process but excludes water, oil and gas [2.3 Definition].

Mineral raw material (Material of economic interest) or, more loosely, *Mineral* includes, but is not limited to, metalliferous minerals; mineralised fill, remnants, pillars, low-grade mineralisation,

⁶ Text in square brackets [] represent the references to defined definitions, clauses, guidelines or appendices in the PERC Reporting Standard.

stockpiles, dumps and tailings; coal; diamonds and other gemstones; industrial minerals; cement feed materials and construction raw materials; dimension stone, ornamental and decorative stone; oil shales, oil sands and other energy minerals extracted by mining methods; and metallic or non-metallic minerals extracted by solution mining methods; mining waste and other waste materials [2.4];

ESMA's definition of **Mineral raw materials** includes hydrocarbons including crude oil, natural gas (whether the hydrocarbon is extracted from conventional or unconventional reservoirs); see www.esma.europa.eu

The PERC Reporting Standard applies to all *Mineral raw materials* for which *Public Reporting of Exploration Results*, *Mineral Resources*, and *Mineral Reserves* are required by any relevant regulatory authority [2.2]. The principles of the PERC Reporting Standard also apply to the assessment and reporting of other *Mineral raw materials* and *Minerals* extracted from liquid brines [2.5].

3.4 Participants and their Responsibilities

The responsibilities of the main interested parties involved in the *Public Reporting on Mineral Properties* are outlined below:

- **Regulators:** are responsible for establishing rules and regulations for *Public Reporting by Issuers*. For instance, the EU's ESMA Prospectus Regulation recognises *Mineral Companies* as specialist *Issuers*, and ESMA has issued specific guidance for *Public Reporting by Mineral Companies*.⁷ These regulations include a requirement for Prospectuses to include a *Competent Person's Report (CPR)* for all transactions above a specified threshold. Guidance is provided on the content of such *CPRs*, including the reporting of *Mineral Resources and, where applicable, Mineral Reserves and Exploration Results/prospects* in accordance with a list of acceptable international *Reporting Standards*, including the PERC Reporting Standard, see **ESMA/2013/319 APPENDIX I&II**

⁷ ESMA/2013/318 www.esma.europa.eu/sites/default/files/library/2015/11/11_81.pdf

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- **Mineral Companies:** must conform to the relevant government legislation, Securities Exchange and Market Regulations for the jurisdictions in which their shares are listed. These regulations typically require *Public Reporting* to comply with specific *Reporting Standards*. It is the responsibility of the *Issuer* to use appropriate professional standards and the requirements for the *Public Reporting* of information on *Mineral Properties*, which in Europe would generally follow the PERC Reporting Standard. To comply with such regulations for such *Public Reporting*, *Mineral Companies* would need to employ or contract qualified and experienced professionals covering disciplines including geology, mining engineering, metallurgy, environmental, social and governance ('ESG') to act as *Competent Person(s)*. The *Issuer* issuing a *Public Report* must also disclose the name(s) of the *Competent Person(s)* and the associated relationship with the *Issuer* [3.5];

- **Minerals Industry Professional Geologists and Engineers:** who are acting as a *Competent Person* are required to be a professional member, registrant or licensee of a *Recognised Professional Organisation (RPO)*⁸ [2.9] and should have the ability to perform the activity [2.9 Guidance] for which they are responsible.

All professional members of a PERC RPO with the required relevant experience to act as *Competent Person(s)* are obliged to apply the principles and appropriate terminology of the PERC Reporting Standard when preparing estimates and documentation to be used as the basis for, or to support, a *Public Report* or *Public Reporting* by *Mineral Companies*;

- **Competent Persons:** Any person commenting upon or reporting on *Mineral raw materials* must meet the requirements of a **Competent Person**, who is a **Minerals industry professional, defined as a professional member, registrant or licensee of a Recognised Professional Organisation (RPO) in the list of Professional Organisations accredited by PERC, with enforceable disciplinary processes, including the powers to suspend or expel a member** [3.2 Definition];

⁸ A RPO is an organisation or association which is recognised for the purposes of the PERC Reporting Standard as providing the professional qualifications or registration required for a person to act as a *Competent Person* [Appendix 10].

A *Competent Person* must assess exploration data, prepare reports on *Exploration Results* (including *Exploration Targets*), and prepare estimates and reports on *Mineral Resources* and *Mineral Reserves* in compliance with the PERC Reporting Standard. *Competent Person(s)* are required to follow industry best practices and should be satisfied in their minds that they could face their peers and demonstrate competence in the commodity, type of *Mineral Deposit*, and situation under consideration [3.14 Guidance], and should be able to defend their work in a Court of Law;

The *Competent Person(s)* must at all times discharge their duties with fidelity to the public and undertake their work with integrity and professional responsibility in their professional or employed capacities. The *Competent Person(s)* must be familiar with the *Code of Ethics* and/or the *Code of Conduct* that applies due to the *Competent Person's* membership in a *Recognised Professional Organisation*. In cases where the relevant Codes have been breached, disciplinary action would be undertaken against such a *Competent Person* by the relevant *Professional Organisation*.

- **Investors or potential investors and their professional advisers:** should check that *Public Reports* by *Mineral Companies* state which *Reporting Code* or *Standard* has been used and check that those reports provide evidence of the written consent of the named *Competent Person(s)* before the release of the *Public Report*, to agree to the form and context in which the information presented in the *Public Report* appears [3.7]. As a matter of due diligence, investors or potential investors should also contact the relevant *Professional Organisation* to confirm that the named *Competent Person(s)* is a member in good standing;

- **Other Interested Parties:** should be aware that there are internationally agreed standards for the *Public Reporting* of information on *Mineral Properties* in different countries or regions, and if necessary, contact the relevant *National Reporting Organisation* (PERC in the case of Europe), *Recognised Professional Organisation*, or CRIRSCO for further information.

3.5 Key Terms used in the Minerals Sector

The definitions and the associated key terms used in *Public Reporting* by Issuers with material *Mineral Properties* are presented in **Appendix 1 of this document: PERC 2021 SUMMARY SHEET – DEFINITIONS.**

Additional terms in common usage are defined below:

Mineralisation is any single *Mineral* or combination of *Minerals* occurring in a mass or deposit of economic interest. The term is intended to cover all forms in which mineralisation might occur, whether by class of deposit, mode of occurrence, genesis, style, or composition [Appendix 10]⁹;

A **Mineral Deposit** is a natural accumulation of a *Mineral* or combination of *Minerals* in the Earth's crust, in the form of one or several bodies of economic interest, which can be extracted at the present time or at some time in the future [Appendix 10];

A **Mineral Company** means a *Company* with material *Mineral Projects* [ESMA 131a]¹⁰ or *Mineral Properties*.

- An *Issuer* involved in exploration and/or mining must report on their *Mineral Properties* to provide reliable, transparent information for investors or potential investors and their professional advisers to enable them to make an informed assessment of the prospects of the *Issuer* [ESMA 131c].

A **Mineral Property** means all mining interests of the *Company* or any of its subsidiaries, including all *Mineral* prospecting and exploration concessions, licences, permits, leases, rights, fee property, claims (including the unpatented claims), surface access rights, easements and all other forms of *Mineral* tenure¹¹.

Mineral Projects are the exploration, development, planning or production activities (including royalty interests) in respect of *Minerals* on *Mineral Proper-*

⁹ Reference to [Appendix 10] refers to the appendices included in the PERC Reporting Standard.

¹⁰ Cross-references to ESMA/2013/319 are presented as ([ESMA 13X.x]).

¹¹ *Mineral Property* definition taken from:

www.lawinsider.com/dictionary/mineral-property

ties involving *Mineral raw materials* [ESMA 131b];

- *Mineral Projects* may also involve concentrates, tailings, and other *Mineral raw materials* that were waste streams from previous mining or processing operation(s), which are now being explored or investigated as a *Mineral raw materials* prospect.

4. Public Reporting by Minerals Companies

4.1 Principles of Public Reporting

A *Public Report* on *Mineral raw materials* is any written or verbal communication concerning *Mineral Properties*. *Public Reports* should be written or spoken (if verbalised) so as not to mislead any member of the public, either intentionally or inadvertently, as to the presence or otherwise of *Mineral raw materials* in or on the Earth's crust, or of their value.

The PERC Reporting Standard intends to provide a minimum standard for *Public Reporting*. **Public Reporting or Public Reports are reports prepared for the purpose of informing investors or potential investors and their professional advisers on Exploration Results (including Exploration Targets), Mineral Resources or Mineral Reserves. They include but are not limited to annual and quarterly Company reports, media releases [2.11 Definition], social media feeds (either through official Company accounts or their representatives), information memoranda, technical papers, website postings and public presentations [2.11 Definition], and other reports to Regulatory Authorities, or as required by law [2.12].**

In cases where summary information is presented, the *Public Report* must clearly state that the information is a summary. A reference must be provided, giving the source and location of the publically available PERC Reporting Standard compliant *Public Report(s)* or *Public Reporting* on which the summary is based [2.16].

The most crucial matter to consider when preparing a *Public Report* is to ensure that the report contains information that investors or potential investors and their professional advisers may rely on when making an investment decision re-

lated to the *Issuer*. A *Public Report* should present information on the material characteristics and assumptions about a *Mineral Property* clearly and transparently, and avoid presenting information that may mislead the readers.

The principles governing the operation and application of the PERC Reporting Standard are transparency, materiality, competence, and accountability [2.6].

- **Transparency** requires that the reader of a *Public Report* is provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and not to be misled [2.7];
- **Materiality** requires that a *Public Report* contains the relevant information that investors or potential investors and their professional advisers would reasonably require and reasonably expect to find in a *Public Report* to make a reasoned and balanced judgement [2.8];
 - Information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions¹² that the investors or potential investors and their professional advisers would generally make from *Public Reports* on *Exploration Results*, *Mineral Resources* and *Mineral Reserves* in respect of *Mineral Properties* held by the *Issuer*;
 - Materiality must be assessed from an investor's point of view to enable investors or potential investors and their professional advisers to make an informed assessment of the prospects of the *Issuer* [ESMA 131c]. The materiality of *Mineral Properties* should be assessed having regard to all the Company's *Mineral Properties* relative to the *Issuer* and its Group taken as a whole [ESMA 131c]. All assumptions must be documented and explained, and full disclosure must be made in the material aspects and associated assumptions.
- **Competence** requires that the *Public Report* is based on work that is the responsibility of a suitably qualified and experienced person(s) who is a professional member, registrant or licensee of a *Recognised Professional Organisation* (RPO) with an enforceable *Code of Ethics* and a disciplinary

process which includes the powers to suspend or expel a member [2.9].

- **The *Competent Person* must have a minimum of five years of relevant experience in the style of mineralisation or type of *Mineral Deposit* under consideration and in the activity that person is undertaking** [3.2 Definition]; and
- **Accountability** requires that the *Competent Person(s)* named in a *Public Report* is an (are) individual(s) who are identified in the *Public Report* as accepting responsibility for the information on which the *Public Report* is based. The *Competent Person(s)* must be entitled to act in the capacity stated in the *Public Report* [2.10] and must be satisfied that their work has not been unduly influenced by the organisation, *Company*, *Reporting Entity*, *Issuer* or person commissioning the *Public Report*, or a report containing information that may be used in the *Public Report* [3.14].

4.2 ESG Aspects of Public Reporting

All *Public Reports* of *Exploration Results*, *Mineral Resources* and *Mineral Reserves* must include the consideration and reporting of the environment, social performance (including health and safety) and governance (ESG) context and factors that could have a material effect on the outcome of the *Mineral Project* or *operation* [2.31] during the exploration, development and operational phases, and after closure [12.1].

ESG refers to the three central factors in assessing the sustainability and societal considerations of a project or operation, namely:

- The **Environmental** factor evaluates how a *Mineral Company* impacts the natural or physical environment, how the *Company* uses natural resources and how its operations impact the environment (directly and through their supply chains);
- **Social Performance** incorporates evidence of effective stakeholder and labour relations engagement, how social impacts are mitigated and managed, how expectations for shared value are optimised, and the health and safety implications [12.1]; and
- **Governance** includes external governance exer-

¹² see International Accounting Standards Board (IASB) definition of *material*: www.ifrs.org

cised by governmental or regulatory authorities, and internal corporate governance [12.1].

The *Competent Person(s)* should include relevant information on the changing internal and external context for a project or operation, including any relevant *ESG Modifying Factors*. ESG aspects and risks associated with a project or operation should be clearly described, together with the management controls/measures/systems and the resulting anticipated impacts [12.1]¹³.

All *Public Reports* on:

- **Exploration Results** must include the initial consideration of the prospects for future economic extraction [5.11], including material ESG threats and opportunities [5.11 Guidance]. Preliminary *ESG Modifying Factors*, including material ESG threats and opportunities, must be considered [5.19] for *Exploration Results* (including *Exploration Targets*) that might constitute fatal flaws in developing a future *Mineral Project* [5.19 Guidance];
- **Mineral Resources** must include the consideration and reporting of ESG context and factors that could influence ‘reasonable prospects for eventual economic extraction’ [6.4] under assumed and justifiable technical, economic and ESG conditions [6.4 Guidance];
- **Mineral Reserves** must include the consideration and reporting of ESG context and factors that could influence the conclusion that extraction could reasonably be justified at the time of reporting [7.6].

4.3 Corporate Responsibility

A *Public Report* concerning the *Issuer’s Exploration Results, Mineral Resources and Mineral Reserves* is the responsibility of the *Issuer*, acting through its *Board of Directors* [3.1]. The appropriate professional standards and requirements for the *Public Reporting* of information on *Mineral Properties* in Europe would generally follow the PERC Reporting Standard.

The *Reporting Standards* require that a *Public Report* must be based on and fairly reflect the information

¹³ Section 12.1 and Table 1 of the PERC Reporting Standard provide examples of ESG aspects that could be considered material.

and supporting documentation on *Exploration Results, Mineral Resources and Mineral Reserves* prepared by or under the direction of and signed by a *Competent Person(s)* [3.3].

The *Issuer* must also:

- Disclose any relevant information concerning a *Mineral Deposit*, including material changes to the *Mineral Resources and Mineral Reserves*, that could materially influence the economic value of the *Mineral Properties* to the *Issuer* [2.22];
- Declare in the *Public Report* the effective date of a *Mineral Resource and Mineral Reserve* statement [2.24];
- Declare in the *Public Report* the *Issuer’s* economic interest in the *Mineral Property* [2.25];
- Ensure that the documentation detailing *Exploration Results, Mineral Resource and Mineral Reserve* estimates, and the considered *Modifying Factors* on which a *Public Report* is based, must be prepared by, or under the direction of, and signed by a *Competent Person(s)* [3.4];
- Disclose the name(s) of the *Competent Person(s)* and any associated relationship with the *Issuer* [3.5];
- Obtain the written consent of the named *Competent Person(s)* before the release of the *Public Report* to agree to the form and context in which the information presented in the *Public Report* appears [3.7]; and
- At least annually, review and produce an annual report where the *Mineral Resources and Mineral Reserves* are updated, and, if required, prepare a *Public Report* on the *Exploration Results, Mineral Resources and Mineral Reserves*, particularly where there are material changes.

4.4 Complaints in respect of Public Reporting

Complaints: made in respect of a *Competent Person’s* professional work are dealt with under the disciplinary procedures of the *Professional Organisation* (PO) of which the *Competent Person* is a member, registrant, or licensee [3.14 Guidance]. The **Code of Ethics and Conduct** would typically include the following obligations:

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- A member of the PO may not take on the functions of an expert in fields other than their own, or accept professional obligations they are not competent to discharge; and
- A member of the PO must not give a professional opinion, make a report, or give legal testimony without being as thoroughly informed as reasonably expected, considering the purpose for which the opinion, report or testimony is desired. The degree of completeness of information upon which the member's work is based must be made clear; and
- A member of the PO must not deliberately mislead the reader, manipulate the data used to prepare the estimates of *Mineral Resources*, or sign off on a *Mineral Property* they are unfamiliar with.

Complaints made in respect of the declared *Competent Person* responsible for *Public Reporting* for an *Issuer*, or in respect of the professional work of the *Competent Person*, must be presented in writing to the *Professional Organisation* of which the *Competent Person* is a professional member, following the relevant Complaint and Disciplinary Procedure of that particular organisation.

5. Key elements of the PERC Reporting Standard

5.1 Exploration Results, Mineral Resources, and Mineral Reserves

Figure 1 of the PERC Reporting Standard, referred to as **PERC Figure 1**, sets out the framework for classifying tonnage and grade or quality estimates to reflect different levels of geological confidence, confidence in the *Modifying Factors* (the factors affecting extraction), and the different degrees of technical and economic evaluation required [4.1]. The categories shown in PERC Figure 1 must be used to report *Exploration Results*, *Mineral Resources*, and *Mineral Reserves* [4.3]; see Figure B.

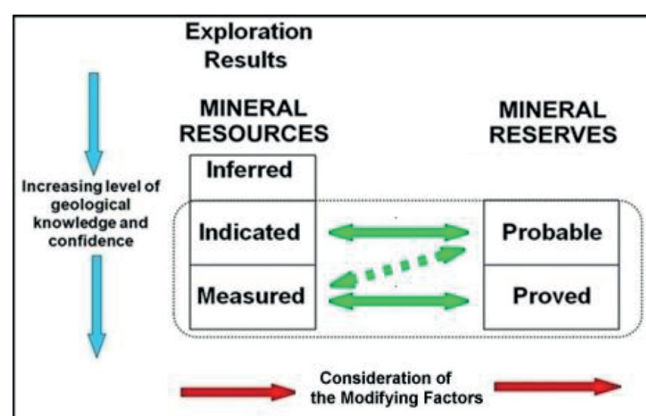


Figure B: PERC Figure 1 shows the general relationship between *Exploration Results*, *Mineral Resources* and *Mineral Reserves* and the *Modifying Factors*

PERC Table 1 in the PERC Reporting Standard is a high-level checklist of reporting and assessment criteria to facilitate a reasoned and balanced approach to the *Public Reporting on Minerals Properties*. It provides, in a summary form, a list of criteria that must be considered by the *Competent Person* when preparing *Public Reports on Exploration Results, Mineral Resources* and *Mineral Reserves*. In the documentation prepared for the *Issuer*, the *Competent Person* must provide comments for the relevant sections of PERC Table 1 on an 'if not, why not' basis [1.8].

In the first *Public Report* of a *Mineral Resource* or *Mineral Reserve* for a *Mineral Property* that is material to the *Issuer*, or when the *Mineral Resource* or *Mineral Reserve* estimates have materially changed from when they were last reported, a summary of the information in the relevant sections of the PERC Table 1 must be provided on an 'if not, why not' basis [6.21, 7.23].

PERC Table 2 in the PERC Reporting Standard provides guidance on the relevance and expected level of detail of the PERC Table 1 sections for the different *Technical Study* types [1.9].

5.2 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, eco-

conomic, marketing, legal, regulatory, environmental, social and governance ('ESG') factors [4.8 Definition].

The *Modifying Factors* relate to all the components used in the evaluation of *Exploration Results*, *Mineral Resources* and *Mineral Reserves*. The *Modifying Factors* must be progressively applied through the Exploration phase, and the Scoping Study, Pre-Feasibility Study, and Feasibility Study stages. The various sub-factors that fall within the broad categories differ markedly, depending on the type of *Mineral Deposit*, the proposed mining method to be used, the proposed mineral processing options selected, and the anticipated impacts in terms of ESG.

Each sub-factor within the *Modifying Factors* contributes to the overall economic and financial inputs into the expected *Life of Mine Plan*.

A risk-based approach should be taken with respect to assessing each sub-factor, taking into account the level of knowledge, level of study and expected impact on the successful exploitation of the *Mineral Project*.

The *Modifying Factors* depend on the understanding of each element, and there should be a demonstrable link between context and factors [12.1]. The level of detail presented should be commensurate with the project's stage of development, with gaps identified and disclosed [12.1]. Changes in ESG aspects alone may contribute to, or become material changes that significantly affect project timeline and/or cost [12.1], or even the ability to proceed. The uncertainties associated with the *Modifying Factors* should be considered when reporting on *Mineral Resources* and *Mineral Reserves* [2.36 Guidance].

5.3 Reporting of Exploration Results

Exploration Results* include data and information generated by *Mineral* exploration programmes that might be of use to investors or potential investors and their professional advisers, but which do not form part of a declaration of *Mineral Resources* or *Mineral Reserves [5.1 Definition].

- Should an *Issuer* report on *Exploration Results*

relating to mineralisation or a *Mineral Deposit*, the *Exploration Results* must **not** be part of a formal declaration of *Mineral Resources* or *Mineral Reserves* [5.3];

- *Public Reports* of the *Exploration Results* must **not** be presented in a way that unreasonably implies the discovery of potentially economic mineralisation [5.3] and must contain sufficient information to allow a considered and balanced judgement of their significance [5.4];
- *Public Reports* must include a description of the geological style and nature of the mineralisation [2.21]; and
- *Exploration Results* must have reasonable prospects of being used to estimate a *Mineral Resource* following further exploration [4.5].

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 mineralisation for which there has been insufficient exploration to estimate *Mineral Resources*** [5.12 Definition].

- Although not encouraged, the *Issuer* in the early stages of an exploration programme on the *Mineral Properties* may report on an *Exploration Target* by stating that the *Issuer* intends to search for the stated *Exploration Target* in a defined geologically prospective setting, area or region;
- At an early stage of exploration, an *Exploration Target* is typically a statement, or estimate based on an exploration concept for the presence of *Minerals* of economic interest in a defined geological setting where such *Mineral raw material* has not yet been confirmed;
- Later in the exploration cycle, an *Exploration Target* would typically be a statement or a preliminary estimate of the exploration potential of an identified zone of *Minerals* of economic interest based on initial sampling results from a specific location where the mineralisation has been identified;
- An *Exploration Target* could also be based on a concept of developing a new extraction or processing method, or evaluating new markets for

Mineral raw material that is currently considered uneconomic;

- The *Competent Person* must state the level of prior exploration work (by the *Issuer* or by others) that has been undertaken before the *Public Reporting* of an *Exploration Target* and must state the associated *Exploration Results* that relate to the *Publicly Reported Exploration Target* [5.14];
- The *Issuer* must also include a proximate statement in the *Public Report* that the potential quantity and grade or quality of the *Exploration Target* is conceptual, that there has been insufficient exploration to define a *Mineral Deposit* or *Mineral Resource*, and that it is uncertain whether further exploration would result in the determination of a *Mineral Resource* [5.16]; and
- Should a *Public Report* includes an *Exploration Target*, there is a requirement that the proposed exploration activities designed to test the validity of the *Exploration Target* must be detailed and must include the budget and timeframe within which the exploration activities are expected to be completed [5.18].

5.4 Reporting of Mineral Resources

A *Mineral Resource* is a concentration or occurrence of solid *raw 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.

***Mineral Resources* are subdivided, in order of increasing geological confidence, into the *Inferred Mineral Resource*, *Indicated Mineral Resource*, and *Measured Mineral Resource* categories [6.1 Definition].**

The choice of the appropriate category of *Mineral Resource* depends upon the quantity, distribution and quality of data available and the level of confidence attached to those data [6.13]. *Public Reports* of *Mineral Resources* must specify one or more of the categories of 'Inferred', 'Indicated' or 'Measured' [6.14].

Mineral Resources are estimates of mineralisation within those portions of a *Mineral Deposit* that have 'reasonable prospects for eventual economic extraction', estimated or interpreted from specific geological information and knowledge, including sampling, with input from other relevant disciplines on relevant matters regarding technical, environmental, social and governance (ESG), and economic factors.

- 'Reasonable prospects for eventual economic extraction' implies a judgement (albeit preliminary) by the *Competent Person(s)* regarding all *Modifying Factors* [6.4 Guidance];
- Any material assumptions made in determining the 'reasonable prospects for eventual economic extraction' must be clearly stated, discussed and justified in the *Public Report* and supporting documentation [6.4 Guidance];
- The assessment of the 'reasonable prospects of eventual economic extraction' of *Mineral Resources* at the time of *Public Reporting* must include a written consideration of the direct and indirect ESG risks and associated environmental and social performance costs related to the extraction, processing, and end-use [12.2];
- Portions of a *Mineral Deposit* where there are no 'reasonable prospects for eventual economic extraction' do **not** qualify as *Mineral Resources* and must **not** be included in *Public Reports* [6.3];
- *Mineral Resource* estimates are not precise calculations, being dependent on the interpretation of limited information on the location, shape and continuity of the *Mineral Deposit* and the available sampling results [6.22 Guidance]. Reporting of tonnage and grade or quality figures must reflect the relative uncertainty of the estimate by rounding off to appropriately significant figures [6.22]; and
- Mineral Resource estimates of quantity and grade or quality are inherently subject to some level of uncertainty and inaccuracy [2.19 Guidance].
- For an ***Inferred Mineral Resource***, **although estimated on the basis of limited geological evidence and sampling, the geological evidence is sufficient to imply, but not verify, geological and grade or quality continuity** [6.5 Definition]. The critical words in the definition

are **'limited'** and **'imply'**;

- For an **Indicated Mineral Resource**, the **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** [6.9 Definition]. The critical words in the definition are **'adequately'** and **'assume'**; and
- For a **Measured Mineral Resource**, the **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** [6.11 Definition]. The critical words in the definition are **'detailed'** and **'confirm'**.

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 sufficient confidence to allow the application of Modifying Factors in sufficient detail to support detailed mine planning and the final evaluation of the economic viability of the Mineral Deposit [6.11 Definition];

- A **Measured Mineral Resource** requires written confirmation in the *Public Report* that the geology, mineralogy, mineability, amenability to processing, and other relevant *Modifying Factors* have been considered [6.12];
- The words 'ore' and 'reserves' must **not** be used in stating *Mineral Resource* estimates, as the terms imply technical feasibility and economic viability [6.19].

5.5 Level of Technical and Economic Study Undertaken

The conversion of *Mineral Resources* to *Mineral Reserves* requires the consideration of the *Modifying Factors* [4.9] and studies to a *Pre-Feasibility Study* or *Feasibility Study* level [7.3]. The estimation of *Mineral Reserves* must include consideration of the relevant *Modifying Factors* with input from a range of disciplines [4.9].

- Any specific legal, permitting, ESG and other factors that would have a material bearing on

the conversion of *Mineral Resources* to *Mineral Reserves* must be reported;

- Should an *Issuer* report *Mineral Reserves*, then the *Issuer* must have undertaken an appropriate technical and economic study (whether a *Pre-Feasibility Study* or a *Feasibility Study*) to determine realistically assumed *Modifying Factors*;

The *Scoping, Pre-Feasibility* and *Feasibility Study* requirements are included in **PERC Table 2** [8.2].

A Scoping Study, or Preliminary Economic Assessment (PEA), is an order of magnitude technical and economic study of the potential viability of Mineral Resources on a Mineral Property 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 [8.3 Definition].

- A *Scoping Study* must **not** be used as the basis for the estimation of *Mineral Reserves* [8.4];
- Following the completion of a *Scoping Study*, the *Issuer* must include a cautionary statement [8.5] that the low-level technical and economic assessments are insufficient to support the estimation of *Mineral Reserves* or provide assurance of an economic development case [8.5 Guidance].

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 extraction method 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 the 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 [8.6 Definition].

- A study to at least a *Pre-Feasibility Study* level must have been carried out to determine that the mine plan and process flowsheet are technically achievable, environmentally and socially acceptable, and economically viable and that the

material *Modifying Factors* have been considered [8.8] to the appropriate level of confidence to be able to convert all or part of the *Mineral Resources* to *Mineral Reserves*.

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. The results of the Feasibility 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 Mineral Project [8.7 Definition].

A Life of Mine Plan is a design and financial and economic study of an existing operation in which appropriate assessments have been made of existing geological, mining, metallurgical and all other *Modifying Factors*, which are considered in sufficient detail (to at least a *Pre-feasibility Study* level) to demonstrate at the time of reporting that continued extraction is reasonably justified [Appendix 10].

- In order to declare *Mineral Reserves*, an existing operation must have a defined *Life of Mine Plan* (of at least a *Pre-Feasibility Study* level [4.7 Guidance]).

5.6 Reporting of Mineral Reserves

A Mineral Reserve is the economically mineable part of a Measured Mineral Resource and/or Indicated Mineral Resource. A Mineral Reserve includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at the Pre-Feasibility Study or Feasibility Study level as appropriate, which include the application of Modifying Factors. Such studies demonstrate that at the time of reporting, extraction could reasonably be justified [7.1 Definition].

- **Mineral Reserves are subdivided in order of increasing confidence into Probable Mineral**

Reserves and Proved Mineral Reserves categories [7.1 Definition], which are determined primarily by the appropriate level of confidence in the geological factors of the *Mineral Resource*, and after considering the degree of confidence or any uncertainties in the *Modifying Factors* [7.12];

- *Mineral Reserves* are those portions of *Indicated Mineral Resources* and *Measured Mineral Resources* which, after the application of the relevant *Modifying Factors*, result in an estimated tonnage and grade or quality that, in the opinion of the *Competent Person(s)* making the estimates, that can be used in the *Life of Mine Plan* and form the basis of a viable *Mineral Project* or operation [7.2] on a *Mineral Property*;
- *Mineral Reserve* estimates must be supported by a *Pre-Feasibility Study* or *Feasibility Study* that demonstrates the *Mineral Project* or operation's technical and economic viability and that, at the time of reporting, extraction could reasonably be justified [4.7].

A Probable Mineral Reserve is the economically mineable part of an Indicated Mineral Resource 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 Proved Mineral Reserve [7.8 Definition].

A Proved Mineral Reserve is the economically mineable part of a Measured Mineral Resource. A Proved Mineral Reserve implies a high degree of confidence in the Modifying Factors [7.10 Definition].

- *Public Reports* of *Mineral Reserves* must specify one or both of the categories of *Proved Mineral Reserves* and *Probable Mineral Reserves* [7.15];
- The assessment that extraction could reasonably be justified for the *Mineral Reserves* at the time of *Public Reporting* must include a written consideration of the direct and indirect environmental cost of extraction, processing, and end-use in terms of environmental degradation, ecological diversity, cultural destruction or climate change [12.2];
- In situations where figures for both *Mineral Resources* and *Mineral Reserves* are reported, a

statement must be included in the *Public Report* which clearly indicates whether the *Measured Mineral Resources* and *Indicated Mineral Resources* are ‘inclusive of’ or ‘additional to’ the *Mineral Reserves* [7.20];

- *Inferred Mineral Resources* are, by definition, always additional to any *Mineral Resources* converted to *Mineral Reserves* [7.20 Guidance];
- *Mineral Reserve* estimates must **not** be added to *Mineral Resource* estimates to report a single combined figure [7.21]; and
- *Mineral Reserve* estimates are not precise calculations. Reporting of tonnage and grade or quality figures must reflect the relative uncertainty of the estimate by rounding off to appropriately significant figures [7.27].

6. Other Aspects

6.1 Securities Exchange Reporting Requirements

The European Securities & Markets Authority defines the Regulations for the European Economic Area Securities Exchanges for both *Mineral raw materials* and hydrocarbons [ESMA/2013/319]. ESMA is an independent European Union Authority that contributes to safeguarding the stability of the European Union’s financial system by ensuring the integrity, transparency, efficiency and orderly functioning of financial markets, as well as by enhancing the protection of investors or potential investors, see www.esma.europa.eu

The UK Stock Exchange Rules for the Official List on the London Stock Exchange (LSE), including the appropriate treatment of *Mineral Companies*, are defined by the FCA. The Alternative Investment Market (AIM) has a more flexible regulatory framework regulated by the LSE¹⁴, see www.londonstockexchange.com

The requirements for *Mineral Companies* given in the Prospectuses Regulation 809/2004 for European Securities Exchanges and Markets [ESMA/2013/319] allow for the use of the CRIRSCO family of *Reporting Standards*, including the PERC

¹⁴ The AIM treatment of *Mineral Companies* is set out in a ‘Note for mining oil and gas companies – 2009’

Reporting Standard, for the reporting of *Mineral raw materials*, including:

- Details of *Mineral Resources*, and where applicable, *Mineral Reserves* (presented separately), and *Exploration Results* in accordance with one or more of the *Reporting Standards*, such as the PERC Reporting Standard [ESMA 132a];
- Anticipated mine life and/or exploration potential or similar duration of commercial activity in extracting the *Mineral Reserves* [ESMA 132b];
- An indication of the duration and principal terms of any licences or concessions and legal, economic and ESG conditions for exploring and developing those licences or concessions [ESMA 132c];
- The current and anticipated progress of the *Mineral* exploration and/or extraction and processing, including a discussion of the accessibility of the *Mineral Deposit* [ESMA 132d]; and
- An explanation of any exceptional factors that have influenced the declaration of *Exploration Results*, *Mineral Resources* and *Mineral Reserves* [ESMA 132e].

6.2 Risk and Uncertainty

Financial Regulators and Securities Exchanges are putting an increasing emphasis on the disclosure of risks and uncertainties associated with financial reporting by businesses, including: financial, legal, technical, reputational, and ESG aspects of a *Mineral Company’s* activities [2.36 Guidance]. Investors and financiers are increasingly using ESG criteria to determine the potential financial performance of a *Mineral Company* [Appendix 10].

Assessment of risks should include the consideration of geological, technical, economic and ESG potential opportunities and threats [Appendix 10] pertinent to relevant aspects of an asset or business that can be estimated within reasonable bounds [2.36 Guidance].

6.3 UNFC-based reporting (non-PERC compliant)

The United Nations Framework Classification for Resources (UNFC), prepared by the United Nations Economic Commission for Europe’s (UNECE)

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Expert Group on Resource Management, is an international scheme for the classification and sustainable management of energy, raw material and other resources.

Although there is an overlapping commonality with the CRIRSCO-type *Reporting Standards*, the UNFC has a different focus, primarily for the long-term sustainable management of natural resources to support the attainment of the 2030 United Nations Agenda for Sustainable Development. In line with its focus on the sustainable management of natural resources, the UNFC allows for the presentation of uneconomic or sub-economic *Mineral Inventory* to be included in National Mineral Inventories.

Together with CRIRSCO, the UNECE has provided a bridging document that illustrates how the CRIRSCO-defined terms relate to the UNFC categories, see www.unece.org

- A **Mineral Inventory** represents the total accumulation of all *Mineral raw material mineralisation* of potential economic interest, drilled or sampled, regardless of cut-off grade, likely mining dimensions, location or continuity [6.4 Guidance], including *Mineral raw material* that does **not** have 'reasonable prospects for eventual economic extraction'. *Mineral Inventory* does **not** have 'reasonable prospects for eventual economic extraction' and so must **not** be aggregated with any category of *Exploration Results* (including *Exploration Targets*), *Mineral Resources* or *Mineral Reserves*, and must **not** be included in *Public Reports* prepared under the PERC Reporting Standard.
- *Mineral Inventory* estimates may include potentially economic or marginally economic mineralisation that would **not** qualify as *Mineral Resources*. Still, *Mineral Companies* may be required to fully disclose all *Mineral raw material* mineralisation of potential economic interest in *Mineral Inventory* and exploration reports to the government, inter-governmental or non-governmental organisations or agencies.
- There are circumstances in which an *Issuer* may be required to record estimates of non-compliant *Mineral* quantities and grade or quality which may not be *Publicly Reported* according to the PERC Reporting Standard. An *Issuer* may be required to provide information on their

Mineral Properties to Governmental Regulatory Authorities, report *Mineral raw materials* estimates and prepare forecasts of *Mineral Inventory* to underpin minerals policies required to attract inward National Investment and exploration activity. Such circumstances may include requirements such as submitting to Government authorities statements as to the mineral potential of properties within their ownership or control in connection with the National Mineral Inventory or spatial planning (prevention of sterilisation). If obliged to prepare such reports, the *Competent Person(s)*, or authors, must include a cautionary note in these reports indicating that such estimates are **not** PERC-compliant and do **not** constitute *Exploration Results*, *Mineral Resources* or *Mineral Reserves*. Where Public Authorities require statements in these categories as a matter of law, they must only be provided when accompanied by a statement that the data and interpretations should be considered strictly confidential and not for publication, unless required to do so by law.

6.4 Oil and Gas Resources and Oil and Gas Reserves (non-PERC compliant)

The PERC Reporting Standard does **not** cover Oil & Gas Resources and Oil & Gas Reserves. Should an *Issuer* have any Oil & Gas Resources and Oil & Gas Reserves in their portfolio of *Mineral Properties*, the reader of the PERC SUMMARY GUIDE should rather follow the *Public Reporting* requirements of the Oil & Gas Industry. Relevant Reporting Standards include the Society of Petroleum Engineers (SPE) Petroleum Resources Management System (PRMS), the Canadian Oil and Gas Evaluation Handbook (COGEH), and the Norwegian Petroleum Directorate classification system, which are designed to provide comprehensive classification frameworks for both conventional and unconventional oil and gas volumes, see www.spe.org, www.speecanada.org, www.norskipetroleum.no

7. Additional Information

7.1 Source Material

- ASX Listing Rules - Guidance Note 31 Reporting on Mining Activities 2013, www.asx.com.au/documents/rules/guidance_note_31_reporting_on_mining_activities.pdf
- CIM Definition Standards for Mineral Resources & Mineral Reserves, 2014, CIM Standing Committee on Reserve Definitions, Canadian Institute of Mining, Metallurgy and Petroleum, www.mrmr.cim.org
- CIMVAL Code for the Valuation of Mineral Properties, Nov 2019, www.mrmr.cim.org/media/1135/cimval-code-november2019.pdf
- CRIRSCO, 2019, Committee For Mineral Reserves International Reporting Standards, November 2019, www.crirSCO.com
- ESMA/2012/607, 2012, Further amendments to ESMA's Recommendations for the consistent implementation of the Prospectus Regulation regarding Mineral Companies, www.esma.europa.eu/sites/default/files/library/2015/11/2012-607.pdf
- ESMA/2013/318, 2013, Consultation Paper on proposed amendments to the ESMA update of the CESR recommendations for the consistent implementation of the Prospectus Regulation regarding Mineral Companies, 20 March 2013, European Securities and Markets Authority, www.esma.europa.eu/sites/default/files/library/2015/11/2013-319.pdf
- ESMA/2013/319, 2013, ESMA update of the CESR recommendations: The consistent implementation of Commission Regulation (EC) No 809/2004 implementing the Prospectus Directive, 20 March 2013, European Securities and Markets Authority, www.esma.europa.eu/sites/default/files/library/2015/11/2013-319.pdf
- IGI Summary Guide to Public Reporting for Mineral Companies in Europe, Published December 2021 (3rd Edition), Institute of Geologists of Ireland, www.igi.ie/assets/uploads/2021/12/IGISummary-Guide-to-Public-Reporting-2021-Final.pdf
- IMVAL Template, 2021, International Mineral Valuation Committee, 4th Edition, April 2021 www.imval.org/templates
- International Accounting Standards Board (IASB) Definition of Material (Amendments to IAS 1 and IAS 8) October 2018, www.ifrs.org/projects/completed-projects/2018/definition-of-material
- Financial Conduct Authority (FCA) Handbook, www.handbook.fca.org.uk
- London Stock Exchange, AIM Note for Mining, Oil & Gas Companies – June 2009, www.docs.londonstockexchange.com/sites/default/files/documents/guidance-note.pdf
- Norwegian Petroleum Directorate's resource classification system 2016 February 2018 Report No. NPD0 716, www.norskpetrolium.no/en/petrolium-resources/resource-classification
- PERC Reporting Standard, 2021, Pan-European Standard for Reporting of Exploration Results, Mineral Resources And Mineral Reserves ('THE PERC REPORTING STANDARD'), The Pan-European Reserves and Resources Reporting Committee (PERC), as approved and published October 2021, www.percstandard.org/perc-standard
- PERC, 2021, PERC Reporting Standard: Recognised Professional Organisations (RPOs), updated Oct 2021, www.percstandard.org/wp-content/uploads/2021/09/PERC-RPO-LIST-OCT-2021.pdf
- SAMREC 2016, The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves 2016 Edition, www.samcode.co.za

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- Society of Petroleum Engineers, 2018, Guidelines for the Application of the Petroleum Resources Management System (SPE-PRMS 2018), June 2018, www.spe.org/en/industry/petroleum-resources-management-system-2018/
- Society of Petroleum Evaluation Engineers Canadian Oil and Gas Evaluation Handbook (COGEH), August 2018, www.speecanada.org/about-us/
- UNECE, 2015, Bridging Document between the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template and the United Nations Framework Classification for Resources (UNFC), May 2015, www.unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/UNFC_specs/Revised_CRIRSCO_Template_UNFC_Bridging_Document.pdf
- UNECE, UNFC and Sustainable Resource Management, www.unece.org/sustainable-energy/unfc-and-sustainable-resource-management
- UNECE, UNFC-2019, United Nations Framework Classification for Resources, ECE ENERGY SERIES No. 61, www.unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/publ/UNFC_ES61_Update_2019.pdf

ESG	Environment, social and governance
ESMA	European Stock Securities and Market Authority
EU	European Union
FAMMP	Fennoscandian Association for Metals and Minerals Professionals
FCA	Financial Conduct Authority
GSL	Geological Society of London
IASB	International Accounting Standards Board
IGI	Institute of Geologists of Ireland
IMEB	Iberian Mining Engineers Board
IMVAL	International Mineral Valuation Committee
IOM3	Institute of Materials, Minerals, Mining
IPO	Initial Public Offering
JORC	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves
LSE	London Stock Exchange
NI	National Instrument
NRO	National Reporting Organisation
PEA	Preliminary Economic Assessment
PERC	Pan-European Reserves and Resources Reporting Committee
PO	Professional Organisation
PRMS	Petroleum Resources Management System
RPO	Recognised Professional Organisation
SPE	Society of Petroleum Engineers
UK	United Kingdom
UNECE	United Nations Economic Commission for Europe
UNFC	United Nations Framework Classification for Resources

7.2 List of Abbreviations

AIM	Alternative Investment Market
ASX	Australian Stock Exchange
COGEH	Canadian Oil and Gas Evaluation Handbook
CPR	Competent Person's Report
CRIRSCO	Committee for Mineral Reserves International Reporting Standards
EFG	European Federation of Geologists
EFTA	European Free Trade Association

Appendix 1: PERC Standard Definitions

2.3 A Mineral is any substance, extracted for value, occurring naturally in or on the Earth, in or under water or in tailings, residues or stockpiles, having been formed by or subjected to a geological process but excludes water, oil and gas.

2.11 Public Reports are reports prepared for the purpose of informing investors or potential investors and their professional advisers on *Exploration Results* (including *Exploration Targets*), *Mineral Resources* or *Mineral Reserves*. They include but are not limited to annual and quarterly company reports, media releases, information memoranda, technical papers, website postings and public presentations.

3.2 A Competent Person is a *Minerals* industry professional, defined as a **professional member, registrant or licensee of a Recognised Professional Organisation (RPO) in the list of professional organisations accredited by PERC**, with enforceable disciplinary processes, including the powers to suspend or expel a member. A *Competent Person* must have a minimum of five years of relevant experience in the style of mineralisation or type of *Mineral* deposit under consideration and in the activity which that person is undertaking.

4.8 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 governance ('ESG') and regulatory factors**.

5.1 Exploration Results include **data and information generated by *Mineral* exploration programmes** that might be of use to investors or potential investors and their professional advisers, but which do not form part of a declaration of *Mineral Resources* or *Mineral Reserves*.

5.12 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 mineralisation for which there has been insufficient exploration to estimate *Mineral Resources*.

6.1 A Mineral Resource is a concentration or occurrence of solid raw 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'**.

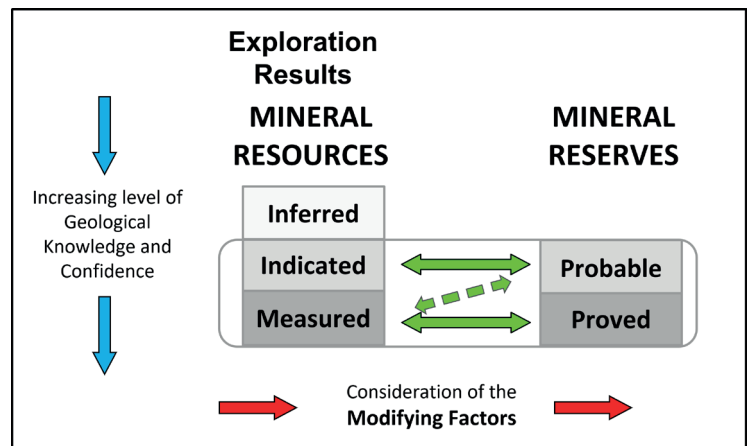
The location, quantity, grade or quality, continuity and other geological characteristics of a *Mineral Resource* are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. *Mineral Resources* are subdivided in order of increasing geological confidence into *Inferred*, *Indicated* and *Measured* categories.

6.5 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 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.

6.9 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 *Mineral* deposit.



PERC Figure 1: The general relationship between *Exploration Results*, *Mineral Resources* and *Mineral Reserves*.

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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*.

6.11 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 *Mineral* 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*. A *Measured Mineral Resource* may be converted to a *Proved Mineral Reserve* or to a *Probable Mineral Reserve*.

7.1 A Mineral Reserve is the economically mineable part of a *Measured Mineral Resource* 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 a *Pre-Feasibility Study* or *Feasibility Study* level, as appropriate, that include the application of *Modifying Factors*.

Such studies **demonstrate that, at the time of reporting, extraction could reasonably be justified**.

The reference point at which *Mineral Reserves* are defined, usually the point where the *Mineral* 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 Reserves are subdivided in order of increasing confidence into *Probable* and *Proved* categories.

7.8 A Probable Mineral Reserve is the economically mineable part of an *Indicated Mineral Resource* 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 *Proved Mineral Reserve*.

7.10 A Proved Mineral Reserve is the economically mineable part of a *Measured Mineral Resource*.

A *Proved Mineral Reserve* **implies a high degree of confidence in the Modifying Factors**.

8.3 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**.

8.6 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*.

8.7 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 *Feasibility 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 *Mineral* project.

The confidence level of the *Feasibility Study* will be higher than that of a *Pre-Feasibility Study*.



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