



**IGI Summary Guide  
to  
Public Reporting  
for Mineral Companies in Europe  
December 2021 (3<sup>rd</sup> Edition)**

Prepared by the  
**Institute of Geologists of Ireland**



**PERC is a Member of**



**The IGI is a founding member of PERC**



# IGI SUMMARY GUIDE TO PUBLIC REPORTING FOR MINERAL COMPANIES IN EUROPE

## 1. Scope of the IGI Summary Guide

The **IGI Summary Guide**<sup>1</sup> has been prepared by the Institute of Geologists of Ireland (IGI) to provide a context to the regulatory framework for the preparation of *Public Reporting*<sup>2</sup> of information on the size, quality and potential value of *Mineral Deposits* by *Competent Persons* employed, directly or indirectly, by *Companies* that have an interest in *Mineral Properties* or *Mineral Assets*.

The **IGI Summary Guide** has been written primarily for persons working in the Minerals Sector to explain the language, common usage terms and the definitions used in the reporting of *Exploration Results*, *Mineral Resources*, and *Mineral Reserves* under the **PERC Reporting Standard**.

## 2. Background

The European Stock Market Authority (ESMA), the relevant regulatory body in Europe, defines *Mineral Companies* as '*Companies with material Mineral Projects*'<sup>3</sup>.

The London Stock Exchange (LSE) 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*)'<sup>1</sup> (Financial Conduct Authority (FCA) Handbook).

Such *Mineral Companies* may rely on investors for financing the evaluation and development of *Mineral Projects*. These investors or potential investors and their professional advisers must not be knowingly misled by any communication or publicity reports issued by, or on behalf, of the *Mineral Companies*.

To ensure that all investors have the same information presented clearly and transparently, and to reduce the risk of investors being misled, most Securities Exchanges on which *Mineral Companies* are traded have introduced regulations to control the *Public Reporting of Mineral Projects*, specifically the *Public Reporting of Exploration Results* (including *Exploration Targets*), *Mineral*

*Resources* and *Mineral Reserves*. These regulations are based on the *Reporting Codes and Standards*, which govern the reporting terminology used to present information on *Mineral Projects* to investors or potential investors and their professional advisers.

The Committee for Mineral Reserves International Reporting Standards (CRIRSCO) is an international grouping of representative organisations responsible for developing *Mineral Reporting Codes and Standards*. As of October 2021, there are fourteen members listed on the CRIRSCO website - see [www.crirSCO.com](http://www.crirSCO.com). CRIRSCO has compiled a set of standard definitions and an agreed template for developing *National Reporting Standards*. CRIRSCO is continuously expanding by working with new jurisdictions to help develop relevant *Reporting Codes and Standards*.

The respective Securities Exchanges then use these *Reporting Codes and Standards* to regulate the reporting of *Exploration Results* (including *Exploration Targets*), *Mineral Resource* and *Mineral Reserves* in **Public Reports**, which **include but are not limited to annual and quarterly company reports, media releases, information memoranda, technical papers, website postings and public presentations** [2.11]<sup>4</sup>.

The Pan-European Reserves and Resources Reporting Committee (PERC), of which the IGI is one of the four founding *Professional Organisations*, is the European member of CRIRSCO. As part of the conditions of membership of CRIRSCO, PERC has developed and periodically updated the **PERC Reporting Standard** based on the CRIRSCO Template, for use by *Mineral Companies* when reporting on *Exploration Results*, *Mineral Resource* and *Mineral Reserves*. References in the IGI Summary Guide are to the **PERC Reporting Standard 2021** ('PERC 2021'). However, existing users are permitted to use the PERC Reporting Standard 2017 until the end of 2022.

Anyone seeking to understand the *solid Mineral raw materials* industry should familiarise themselves with the sector's language; the **IGI Summary Guide** provides a valuable starting point. In particular, the proper use of the terms *Exploration Results*, *Mineral Resources* and *Mineral Reserves* must be noted. The specialist minerals geologist, mining engineer, processing engineer, or any other interested person must understand the use of these terms, when to use

<sup>1</sup> Text in **Bold** format represents key terms in the IGI Summary Guide and the main Definitions (see Appendix 1).

<sup>2</sup> Text in *Italics* represents the defined terms and other reporting terminology used in the **PERC Reporting Standard**.

<sup>3</sup> Highlighted texts are direct quotes from the Reference Text.

<sup>4</sup> Cross-references to the **PERC Reporting Standard** clauses are presented as **[X.X]** (e.g. [3.1] is clause 3.1, [3.14g] represents the guidance under clause 3.14).

The **IGI Summary Guide** provides an introduction to the Reporting of *Exploration Results*, *Mineral Resources* and *Mineral Reserves* under the **PERC Reporting Standard** for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)

them and more importantly, when not to use them.

The **PERC Reporting Standard** 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].

Any person commenting upon or reporting on *solid 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)<sup>5</sup> in the list of professional organisations accredited by PERC, with enforceable disciplinary processes, including the powers to suspend or expel a member** [3.2].

The **IGI Summary Guide** summarises the principles and standard definitions underlying the **PERC Reporting Standard**. The **IGI Summary Guide** highlights the key aspects of *Public Reporting* for *Mineral Companies*, as presented in the **PERC Reporting Standard 2021**, as an easy reference for both non-technical and expert users.

The **IGI Summary Guide** is, however, not a substitute for the **PERC Reporting Standard**, and any *Competent Person* preparing a *Public Report* must comply with the full text of the **PERC Reporting Standard 2021** at [www.percstandard.org/perc-standard/](http://www.percstandard.org/perc-standard/)

ESMA's definition of *Mineral Projects* includes 'hydrocarbons including crude oil, natural gas (whether the hydrocarbon is extracted from conventional or unconventional reservoirs.'

For Oil and Gas Reporting, the user of the **IGI Summary Guide** is directed to the Petroleum Resources Management System (SPE-PRMS), designed to provide a comprehensive classification framework for both *conventional and unconventional oil and gas volumes* that a *Company* may have associated with its portfolio of *Oil and Gas Resources* and *Oil and Gas Reserves* - see [www.spe.org](http://www.spe.org)

### 3. Responsibilities

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

---

<sup>5</sup> A *Recognised Professional Organisation (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*.

The **IGI Summary Guide** provides an introduction to the Reporting of Exploration Results, Mineral Resources and Mineral Reserves under the **PERC Reporting Standard** for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)

- **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 be done in compliance with specific *Reporting Codes* or *Reporting Standards*. It is the responsibility of the *Company or Reporting Entity<sup>6</sup>, acting through its Board of Directors* [3.1], to use the appropriate professional standards and requirements for the *Public Reporting* of information on *Mineral Properties or Mineral Assets*, which in Europe, would generally follow the **PERC Reporting Standard**. To comply with such regulations, *Mineral Companies* would need to employ or contract a suitably qualified and experienced professional geologist or engineer to act as *Competent Person(s)* for such *Public Reporting*. *The Company or Reporting Entity* issuing a *Public Report* must disclose the name(s) of the *Competent Person(s)* [3.5];

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

All professional members of a 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:** are required to assess exploration data, prepare reports on *Exploration Results* (including *Exploration Targets*), 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 own minds that they could face their peers and demonstrate competence

---

<sup>6</sup> *Reporting Entity* means an entity in respect of which it is reasonable to expect the existence of users who rely on the entity's general purpose financial statements for information that will be useful to them for making and evaluating decisions about the allocation of resources.

in the commodity, type of *Mineral Deposit* and situation under consideration [3.14g], 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 of a *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 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 should also contact the relevant *Professional Organisation* to confirm that the named *Competent Person* 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* or *Mineral Assets*, and if necessary, contact the relevant *National Reporting Organisation* (PERC in the case of Europe), *Professional Organisation* (e.g. IGI), or CRIRSCO for further information.

#### 4. The PERC Reporting Standard

The Pan-European Reserves and Resources Reporting Committee (PERC) serves as the *National Reporting Organisation* for Europe, including, but not limited to, member countries of the European Union (EU).

Representation on PERC includes representatives from the major and junior mining sectors, industrial minerals, aggregates, coal, the investment and financial community, consultants and professional accreditation organisations.

The **PERC Reporting Standard** is the European equivalent of a family of *Reporting Codes* and *Standards* that follow the *CRIRSCO International Reporting Template* for the *Public Reporting of Exploration Targets, Exploration Results, Mineral Resources* and *Mineral Reserves*. The **PERC Reporting Standard** applies to all *solid Mineral raw materials* for which *Public Reporting of Exploration Results, Mineral Resources, and Mineral Reserves*

is required by any relevant regulatory authority [2.2].

The **European Securities and Markets Authority** (ESMA) is an independent EU Authority that contributes to safeguarding the stability of the European Union's financial system. ESMA allows for the use of the CRIRSCO family of *Reporting Codes* and *Standards*, including the **PERC Reporting Standard**, for the *Public Reporting of solid Mineral raw materials*.

The six-member organisations of PERC, namely: Institute of Geologists of Ireland (IGI); Institute of Materials, Minerals, Mining (IOM3); Geological Society of London (GSL); the European Federation of Geologists (EFG); Fennoscandian Association for Metals and Minerals Professionals (FAMMP) and the Iberian Mining Engineers Board (IMEB) 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.

#### 5. Definitions of some Key Terms

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

**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 [2.3]<sup>7</sup>.**

The term *Mineral, or solid Mineral raw material* includes, but is not limited to, metalliferous minerals; mineralised fill, remnants, pillars, low-grade mineralisation, 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]. 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];

**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

---

<sup>7</sup> The text of the Standard Definition is highlighted in **Bold** text.

The **IGI Summary Guide** provides an introduction to the Reporting of Exploration Results, Mineral Resources and Mineral Reserves under the **PERC Reporting Standard** for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)

might occur, whether by class of deposit, mode of occurrence, genesis, style, or composition [Ap10].

A **Mineral Deposit** is a natural accumulation of *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 [Ap10].

A **Mineral Company** means a *company* with material *Mineral Projects* (131a<sup>8</sup>).

- A *Mineral Company* involved in exploration and/or mining listed on a Stock Exchange must report on their *Mineral Properties* or *Mineral Assets* using a balanced approach to providing reliable, transparent information for investors or potential investors and their professional advisers to allow them to make an informed assessment of the significance of the *Mineral Company's* prospects.

**Mineral Projects** means the exploration, development, planning or production activities (including royalty interests) involving *Minerals* (131b).

- *Mineral Projects* may also involve concentrates, tailings, and other materials that might have been waste in a previous operation(s) but now might be explored or investigated as a *Mineral* prospect.

## 6. Principles of Public Reporting

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

The intent of the **PERC Reporting Standard** is 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, information memoranda, technical papers, website postings and public presentations [2.11], and other reports to regulatory authorities, or as required by law [2.12].

<sup>8</sup> Cross-references to **ESMA/2013/319** are presented as **(13X.x)**.

The **IGI Summary Guide** provides an introduction to the Reporting of Exploration Results, Mineral Resources and Mineral Reserves under the **PERC Reporting Standard** for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)

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 important matter to consider when preparing a *Public Report* is to ensure that the report contains information that an investor or potential investor and their professional advisers may rely on when making an investment decision related to the *Mineral Company* or *Reporting Entity*. A *Public Report* should present information on the material characteristics and assumptions about a *Mineral Project* clearly and transparently, and avoid presenting information that may mislead 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 all the relevant information which 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].

Materiality must be assessed from an investor point of view to enable investors to make an informed assessment of the prospects of the *Mineral Company/ Reporting Entity/ Issuer*<sup>9</sup> (131c). The materiality of *Mineral Projects* should be assessed having regard to all the *Company's Mineral Projects* relative to the *Reporting Entity/ Issuer* and its group taken as a whole (131c). All assumptions must be documented and explained, and full disclosure must be made in all material aspects and 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*

<sup>9</sup> An *Issuer* is a legal entity that develops, registers and sells securities to finance its operations.

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 relevant experience in the style of mineralisation or type of Mineral Deposit under consideration and in the activity that person is undertaking [3.2];** 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*, or person commissioning the *Public Report* or a report containing information that may be used in a *Public Report* [3.14].

## 7. Corporate Responsibility for Public Reporting

A *Public Report* concerning the *Company's* or *Reporting Entity's* *Exploration Results*, *Mineral Resources* and *Mineral Reserves* is the responsibility of the *Company* or *Reporting Entity*, acting through its *Board of Directors* [3.1].

The *Reporting Codes* and *Standards* require that a *Public Report* must be based on and fairly reflect the information 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 *Mineral Company* 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 Deposit* to the *Mineral Company* [2.22];
- Declare the effective date of a *Mineral Resource* and *Mineral Reserve* statement [2.24];
- Declare the *Company's* or *Reporting Entity's* economic interest in the *Mineral Project* or operation [2.25];
- Ensure that the documentation detailing *Exploration Results*, *Mineral Resource* and *Mineral Reserve* estimates, 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 *Company* or *Reporting Entity* [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];
- At least annually review and, if required, prepare a *Public Report* on their, *Exploration Results*, *Mineral Resources* and *Mineral Reserves*.

## 8. Non-Public Reporting (Non-compliant Reporting)

The United Nations Framework Classification for Resources (UNFC), prepared by the United Nations Economic Commission for Europe's (UNECE) Expert Group on Resource Management, is an international scheme for the classification, management and reporting of energy, mineral, and raw material resources. The UNFC system is used for Policy formulation in energy and raw material studies, National Resources Management functions as well as Corporate business processes. Although there is an overlapping commonality with the CRIRSCO type *Reporting Codes* and *Standards*, the UNFC has a different focus, primarily for the long-term management of National Mineral Assets. Together with CRIRSCO, the UNECE has provided a bridging document that illustrates how the CRIRSCO defined terms relate to the UNFC categories (UNECE, 2015). In line with its focus on sustainable resource management, the UNFC allows for the presentation of uneconomic or sub-economic Mineral Inventory.

- A **Mineral Inventory** represents the total accumulation of all mineralisation of potential economic interest, drilled or sampled, regardless of cut-off grade, likely mining dimensions, location or continuity [6.4g], including material that does not have 'reasonable prospects for eventual economic extraction'. Mineral Inventory does not have reasonable prospects for eventual economic extraction and must not be aggregated with any category of *Mineral Resources* or *Mineral Reserves*, and must not be included in *Public Reports*.
- Mineral Inventory estimates may include potentially economic or marginally economic mineralisation that would not qualify as

The **IGI Summary Guide** provides an introduction to the Reporting of Exploration Results, Mineral Resources and Mineral Reserves under the PERC Reporting Standard for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)

*Mineral Resources*, but may be required to fully disclose all *mineralisation* of potential economic interest in Mineral Inventory and exploration reports to the government, inter-governmental or non-governmental organisations or agencies.

- A Mineral Company may be required to provide information on their *Mineral Properties* or *Mineral Assets* to other Regulatory Authorities, report *solid Mineral raw materials* estimates and prepare forecasts of Mineral Inventory to underpin minerals policies required to attract inward investment and exploration activity. 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 Targets, Exploration Results, Mineral Resources* or *Mineral Reserves*. There are circumstances in which a Company 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**. These circumstances may include requirements such as submitting to Government authorities statements as to the mineral potential of land within their ownership or control in connection with National Mineral Inventory or spatial planning (prevention of sterilisation). Where public authorities require statements in these categories as a matter of law, they must be provided only accompanied by a statement that they are strictly confidential and not for publication.

## 9. Exploration Results, Mineral Resources, and Mineral Reserves

**PERC Figure 1** of the **PERC Reporting Standard** sets out the framework for classifying tonnage and grade or quality estimates to reflect different levels of geological confidence, confidence in the

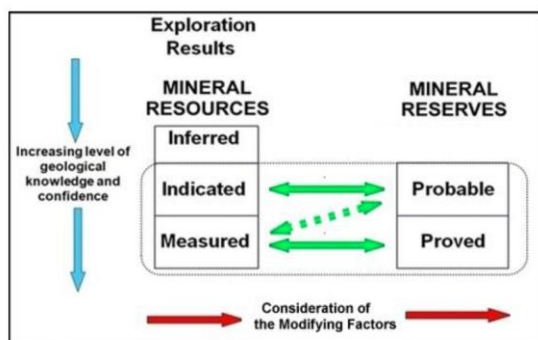


Figure 1 The general relationship between Exploration Results, Mineral Resources and Mineral Reserves

*Modifying Factors* (the factors affecting extraction, see Section 12) 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].

**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 *Public Reporting of Minerals Projects*. It provides, in a summary form, a list of criteria that must be considered when preparing *Public Reports on Exploration Results, Mineral Resources* and *Mineral Reserves*. Commentary must be provided for all 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 project or operation that is material to the *Company* or *Reporting Entity*, or when the *Mineral Resource* or *Mineral Reserve* estimates have materially changed from when they were last reported, a summary of the information in 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].

## 10. 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].

- If an *Exploration Company* or *Mineral Company* reports on *Exploration Results* relating to mineralisation or a *Mineral Deposit*, then 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];
- 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];

The **IGI Summary Guide** provides an introduction to the Reporting of Exploration Results, Mineral Resources and Mineral Reserves under the **PERC Reporting Standard** for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)



**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].**

- Although not encouraged, an Exploration Company or Mineral Company in the early stages of an exploration programme may report on an Exploration Target by stating that the Company 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 Mineral(s) of economic interest in a defined geological setting where such material has not yet been confirmed.
- Later in the exploration cycle, an Exploration Target would typically be a statement or estimate of the exploration potential of an identified zone of Mineral(s) 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 to develop a new extraction or processing method or to develop a new market for material that is currently considered uneconomic.
- The Competent Person must state the level of prior exploration work (by the Mineral Company or Reporting Entity or by others) that has been undertaken prior to 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 Mineral Company 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
- If 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].

## 11. Reporting of Mineral Resources

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

**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].**

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 Resource estimates of quantity and grade or quality are inherently subject to some level of uncertainty and inaccuracy [2.19g].

- **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].** The critical words in the definition are 'limited' and 'imply';
- **For an Indicated Mineral Resource, the geological evidence is derived from the 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].** 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].** The critical words in the definition are 'detailed' and 'confirm'.
- Mineral Resources are estimates of mineralisation within those portions of a Mineral Deposit that have 'reasonable

The **IGI Summary Guide** provides an introduction to the Reporting of Exploration Results, Mineral Resources and Mineral Reserves under the PERC Reporting Standard for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)

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.

- 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];
- 'Reasonable prospects for eventual economic extraction' implies a judgement (albeit preliminary) by the *Competent Person(s)* regarding all *Modifying Factors* [6.4g];
- 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 [6.4g];
- The assessment of the 'reasonable prospects of eventual economic extraction' of *Mineral Resources* and that extraction could reasonably be justified for *Mineral Reserves* at the time of *Public Reporting* must include a written consideration of the direct and indirect environmental and social cost of extraction, processing, and end-use in terms of environmental degradation, ecological diversity, cultural destruction or climate change [12.2];
- *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 on the available sampling results [6.22g]. 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
- 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 the evaluation of the economic viability of the *Mineral Deposit* [6.9].
- 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].

- 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].

## 12. Level of Technical and Economic Study Undertaken

The conversion of *Mineral Resources* to *Mineral Reserves* requires the consideration of the *Modifying Factors*. The estimation of *Mineral Reserves* must include consideration of all relevant *Modifying Factors* with input from a range of disciplines (4.9).

**'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, governance ('ESG') and regulatory factors [4.8].**

- Any specific legal, permitting, social, environmental and other factors that would have a material bearing on the conversion of *Mineral Resources* to *Mineral Reserves* must be reported.
- Should a *Mineral Company* report *Mineral Reserves*, then the *Mineral Company* must have undertaken an appropriate technical and economic study (whether a *Pre-feasibility Study* or a *Feasibility Study*) to determine realistically assumed *Modifying Factors* and to determine that a mine plan and process flowsheet is technically achievable, environmentally and socially acceptable, and economically viable [8.8].

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* 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].

- 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 *Company* or *Reporting Entity* must include a cautionary statement [8.5] that the low level technical and economic assessments are insufficient to support estimation of *Mineral Reserves* or provide assurance of an economic development case [8.5g].

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 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].

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

An *Operational 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 [Ap10].

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

### 13. 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 *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 [7.1].

- *Mineral Reserves* are subdivided in order of increasing confidence into *Probable Mineral Reserves* and *Proved Mineral Reserves* categories [7.1], which is 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 all relevant *Modifying Factors*, result in an estimated tonnage and grade or quality, that in the opinion of the *Competent Person(s)* making the estimates, can be the basis of a viable project or operation [7.2].
- *Mineral Reserve* estimates must be supported by a *Pre-Feasibility Study* or *Feasibility Study* that demonstrate the projects 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].

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].

- *Public Reports of Mineral Reserves* must specify one or both of the categories of *Proved Mineral Reserves* and *Probable Mineral Reserve* [7.15];
- The assessment of the reasonable justification for extraction of *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* [7.20g];
- *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].

#### 14. European Securities Exchange and Stock Market Reporting Requirements

The **European Securities & Markets Authority** (ESMA) defines the regulations for the European Economic Area (EEA) Stock Exchanges for both *solid 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, [www.esma.europa.eu](http://www.esma.europa.eu)

UK Stock Exchange Rules for the Official List, including the appropriate treatment of *Mineral Companies*, is defined by the Financial Conduct Authority (FCA). The Alternative Investment Market (AIM) has a more flexible regulatory framework regulated by the London Stock Exchange. The AIM treatment of *Mineral Companies* is set out in a 'Note for mining oil and gas companies – 2009'.

The **IGI Summary Guide** provides an introduction to the Reporting of Exploration Results, Mineral Resources and Mineral Reserves under the **PERC Reporting Standard** for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)

The Requirements for *Mineral Companies* given in the Prospectuses Regulation 809/2004 for European Stock Exchanges and Markets (ESMA/2013/319) allows for the use of the CRIRSCO family of *Reporting Codes and Standards*, including the **PERC Reporting Standard** for the reporting of *solid 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** (132a);
- Anticipated mine life and/or exploration potential, or similar duration of commercial activity in extracting the *Mineral Reserves* (132b);
- An indication of the duration and main terms of any licences or concessions and legal, economic, environmental and social conditions for exploring and developing those licences or concessions (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* (132d); and
- An explanation of any exceptional factors that have influenced the clauses above in the declaration of *Exploration Results, Mineral Resources* and *Mineral Reserves* (132e).

#### 15. 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* of which the *Competent Person* is a member or registrant or licensee [3.14g].

The **IGI Code of Ethics and Conduct** includes the following obligations:

- A member of the IGI 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 (IGI Code of Ethics 2); and
- A member of the IGI may not give a professional opinion, make a report, or give legal testimony without being as thoroughly informed as might be reasonably expected, considering the purpose for which the opinion, report or testimony is desired. The degree of completeness of information upon which it is based must be made clear. (IGI Code of Ethics 8).

**IGI Complaint and Disciplinary Procedures:** A complaint that a member of the IGI has breached the Institute's Code of Ethics in force at the time shall be referred to the Ethics Committee for a hearing as expeditiously as possible (IGI Code of Ethics 28).

Complaints made in respect of the declared *Competent Person*, who is a professional member of the IGI, responsible for *Public Reporting* for a *Mineral Company*, or in respect of the professional work of the *Competent Person*, must be presented in writing to the IGI using the **IGI Complaints Form** following the **IGI Complaint and Disciplinary Procedure** outlined on the IGI's Code of Ethics and Conduct website: [www.igi.ie/about-us/ethics/](http://www.igi.ie/about-us/ethics/)

## 16. Source Material

- CRIRSCO, 2019, Committee For Mineral Reserves International Reporting Standards, September 2019, [www.crirSCO.com](http://www.crirSCO.com)
- 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](http://www.esma.europa.eu)
- 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](http://www.esma.europa.eu)  
**References (131a) to (132e)**
- Financial Conduct Authority Handbook, <https://www.handbook.fca.org.uk/>
- Institute of Geologists of Ireland, IGI, [www.igi.ie](http://www.igi.ie)
- Institute of Geologists of Ireland, 2000, IGI Code of Ethics and Conduct, 2000, <http://igi.ie/assets/uploads/2016/01/Code-of-Ethics.pdf>
- London Stock Exchange, 2009, Note for Mining Oil & Gas Companies – June 2009, <https://docs.londonstockexchange.com/sites/default/files/documents/guidance-note.pdf>
- 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 1 October 2021, [https://percstandard.org/perc-standard/References \[1.1\] to \[Ap10\]](https://percstandard.org/perc-standard/References [1.1] to [Ap10])
- PERC, 2021, PERC Reporting Standard: Recognised Professional Organisations (RPO's), updated Oct 2021, <https://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](http://www.samcode.co.za)
- Society of Petroleum Engineers, 2018, Guidelines for the Application of the Petroleum Resources Management System (SPE-PRMS 2018), June 2018, <https://www.spe.org/en/industry/petroleum-resources-management-system-2018/>
- 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, [https://www.unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/UNFC\\_specs/Revised\\_CRIRSCO\\_Template\\_UNFC\\_Bridging\\_Document.pdf](https://www.unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/UNFC_specs/Revised_CRIRSCO_Template_UNFC_Bridging_Document.pdf)
- UNECE, About UNFC and Sustainable Resource Management, <https://unece.org/sustainable-energy/unfc-and-sustainable-resource-management>
- UNECE, UNFC-2019, United Nations Framework Classification for Resources, ECE ENERGY SERIES No. 61, [https://unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/publ/UNFC\\_ES61\\_Update\\_2019.pdf](https://unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/publ/UNFC_ES61_Update_2019.pdf)

The **IGI Summary Guide** provides an introduction to the Reporting of Exploration Results, Mineral Resources and Mineral Reserves under the PERC Reporting Standard for European Stock Exchanges and Markets [www.percstandard.org](http://www.percstandard.org)

# Appendix 1: PERC 2021 SUMMARY SHEET 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 Organisations (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 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 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.

Geological evidence is derived from the 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.

**NOTE:** Definition Numbers are from the **PERC Reporting Standard 2021**; alternate definitions are shaded in blue to improve legibility. Defined terms are underlined; key phrases are highlighted in dark blue bold text.

Geological evidence is derived from the 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 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**.

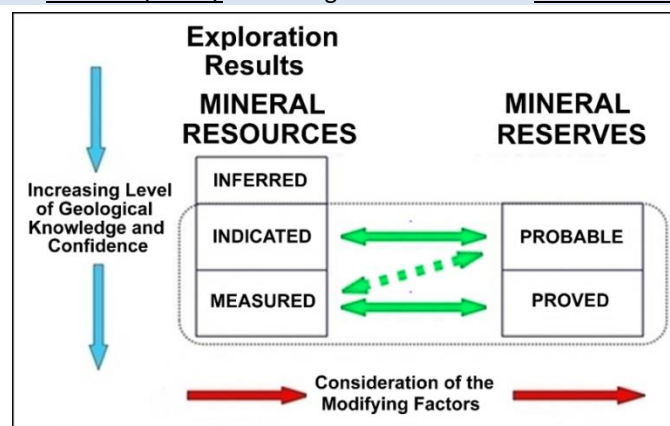
**8.3** A **Scoping Study** is an order of magnitude technical and economic study of the potential viability of Mineral Resources that includes appropriate assessments of realistically assumed Modifying Factors together with any other relevant operational factors that are necessary to demonstrate at 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.



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

**NOTE:** Definition Numbers are from the **PERC Reporting Standard 2021**; alternate definitions are shaded in blue to improve legibility. Defined terms are underlined; key phrases are highlighted in dark blue bold text.

