



# GSEU

**GEOLOGICAL SERVICE | FOR EUROPE**

## **GSEU WP2 TRAIN-THE-TRAINER COURSE**

**Module: Introduction**

**Level 1**

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Ljubljana , 15-16 April 2024



Funded by  
the European Union



[www.geologicalservice.eu](http://www.geologicalservice.eu)

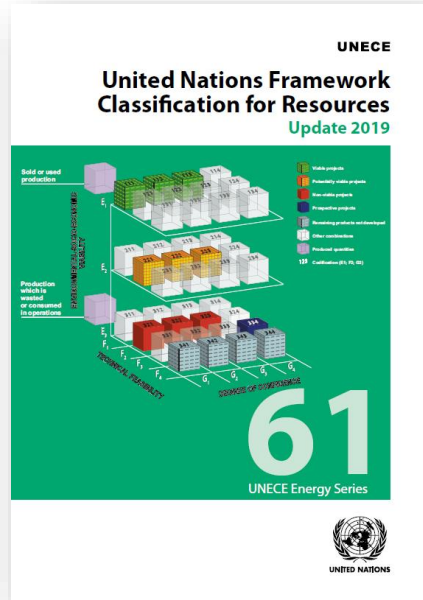


14h15 – 15h30

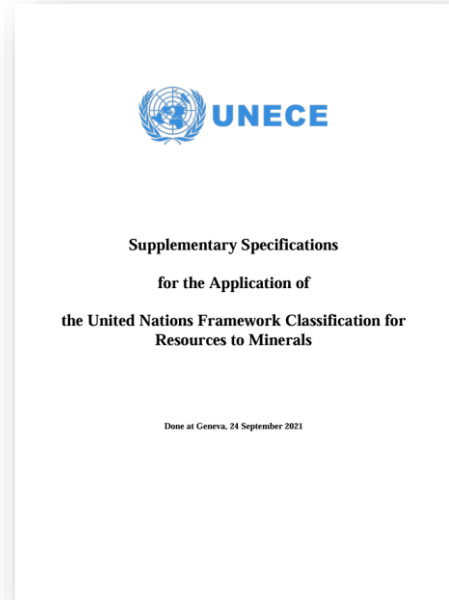
# CRIRSCO-UNFC Bridging Document



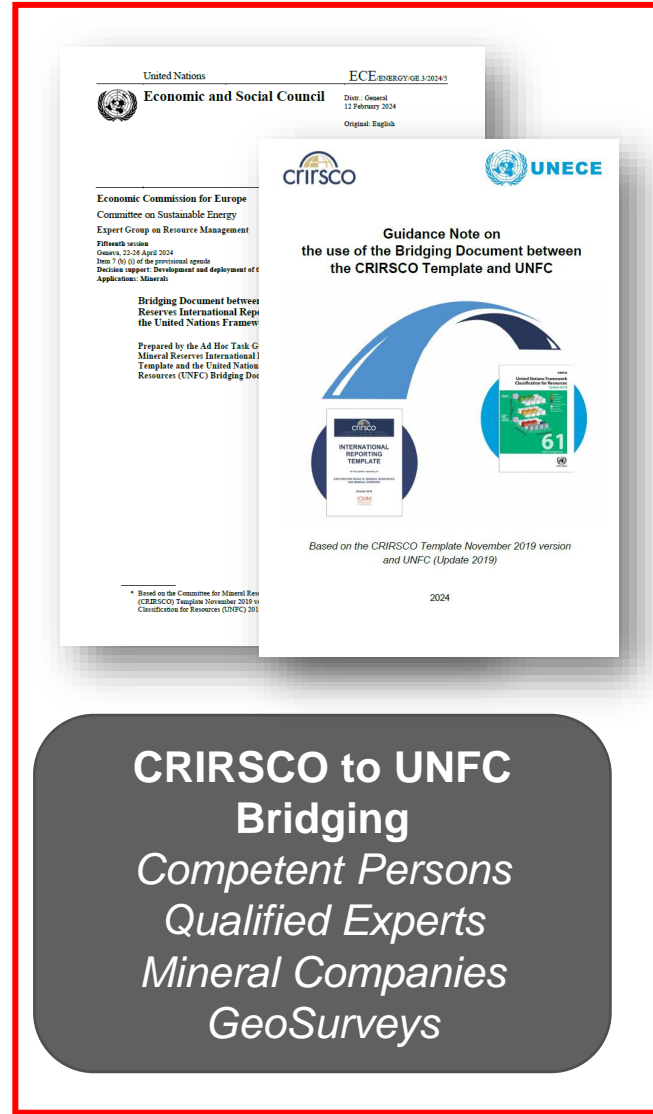
# Main Documents



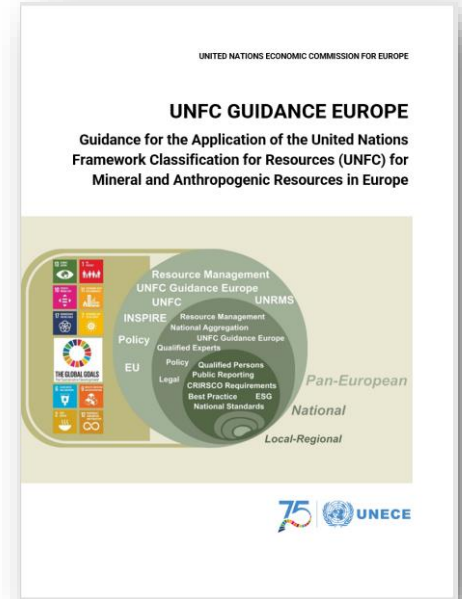
**Generic, global standard, UNFC Principles**  
*All*



**Specifications for mineral projects**  
*Competent Persons  
Qualified Experts  
Mineral Companies  
GeoSurveys*



**CRIRSCO to UNFC Bridging**  
*Competent Persons  
Qualified Experts  
Mineral Companies  
GeoSurveys*

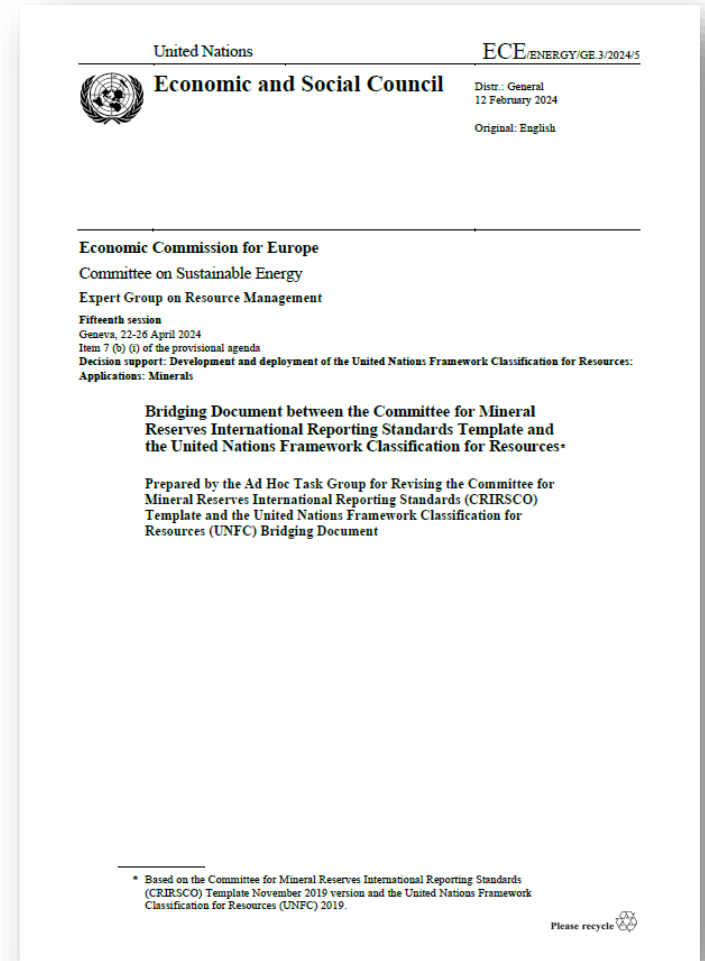


**UNFC and INSPIRE**  
*Qualified Experts  
GeoSurveys  
Authorities (national and EU level)*



# CRIRSCO-UNFC Bridging Document

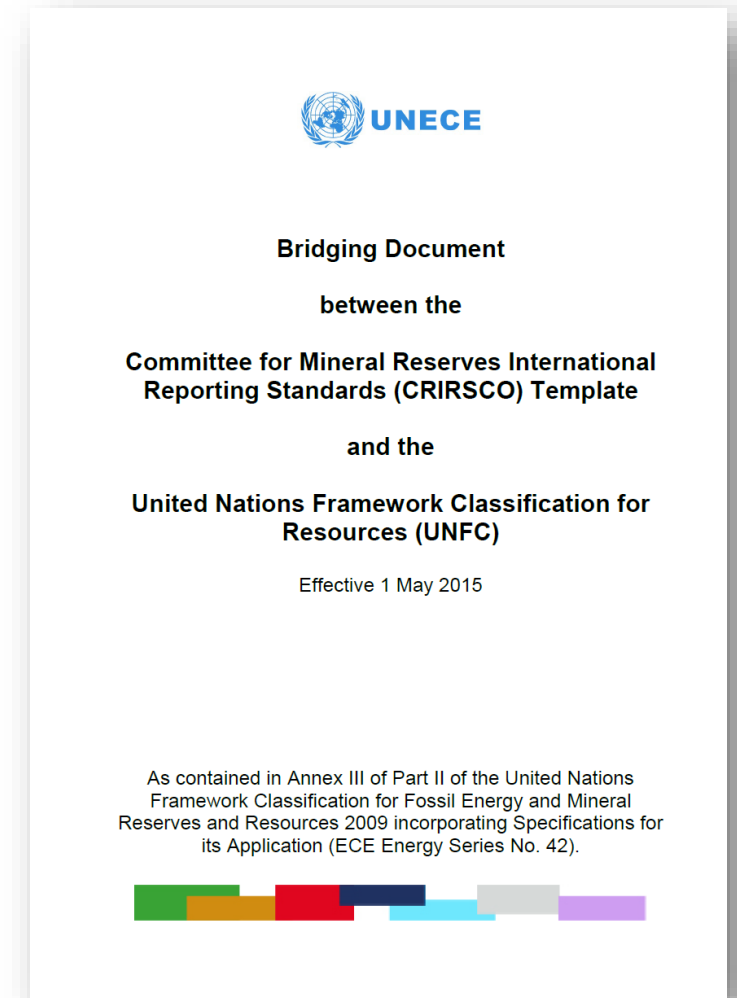
- The purpose of a Bridging Document is to **explain “the relationship between the United Nations Framework Classification for Resources (UNFC) and another classification system, including instructions on how to classify estimates generated by the application of that system using the UNFC Numerical Codes” (UNFC, 2019).**
- **The CRIRSCO-UNFC Bridging Document** provides a basis for classifying estimates generated by CRIRSCO Template-aligned reporting codes and standards using the UNFC classification system.





# CRIRSCO-UNFC Bridging Document

- Agreed Joint Definitions (1998-2004)
  - UNECE Task Force and an Expert Group of the Council of Mining and Metallurgical Institutions (CMMI)
  - Agreed to integrate their respective definitions into a single, universally applicable set of definitions.
  - Approved at a meeting in Geneva in November 1999 (UNECE, 2000).
  - Bridging Document (2015) was based on CRIRSCO Template 2013 and UNFC 2009 versions.



# CRIRSCO-UNFC Bridging Document

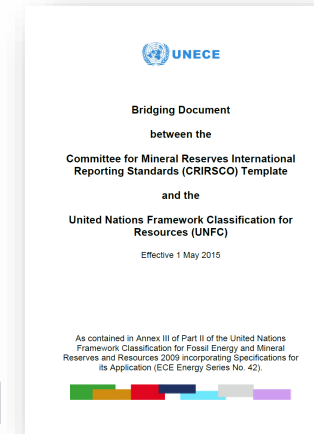
- **Bridging Document between the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template and the United Nations Framework Classification for Resources (UNFC)**
  - *The **official UNECE version** (“short version”) complies the UN’s rules on formatting of parliamentary documents. The document will be presented for approval by EGRM in Resource Management Week (Geneva, 22-26 April 2024).*
- **Guidance Note on the use of the CRIRSCO-UNFC Bridging Document**
  - ***Supportive document** aimed at providing **more detailed guidance** on the use of the Bridging Document to **assist users who are applying it.***





# CRIRSCO-UNFC Bridging Document

- Revised Figure III.2
  - *Pre-Feasibility study*
  - *Mineral Resources exclusive of Mineral Reserve*
- Replaced Figure III.3 with a simplified version
- Added:
  - *Competency and Qualification requirements*
  - *Tables for E, F and G axis values with UNFC & CRIRSCO descriptions*
  - *References*
  - *Comments on UNFC to CRIRSCO conversion*





# Committee for Mineral Reserves International Reporting Standards (CRIRSCO)

## CRIRSCO Template

CRIRSCO was formed in 1994 and it currently representing fifteen national reporting organisations (NROs) around the world.

**The CRIRSCO Template** provides:

- a framework for the CRIRSCO-aligned reporting codes and standards.
- recognized and adopted world-wide for market-related reporting and financial investment.
- The CRIRSCO Template is the international standard for the reporting of Exploration Targets, Exploration Results, Mineral Resources, and Mineral Reserves and represents current international leading practices for the preparation of Public Reports by Mineral Companies.



COMMITTEE FOR MINERAL RESERVES  
INTERNATIONAL REPORTING STANDARDS







# Comparison of the CRIRSCO Template and UNFC

## *Guidance Note on the use of the CRIRSCO Template-UNFC Bridging Document, IIC*

- UNFC and the CRIRSCO Template were developed for different purposes but are complementary in nature.

### UNFC

UNFC is an internationally applicable scheme for the classification of energy and raw material resource projects at all stages of development which can also be applied to non-economic and non-commercial projects.

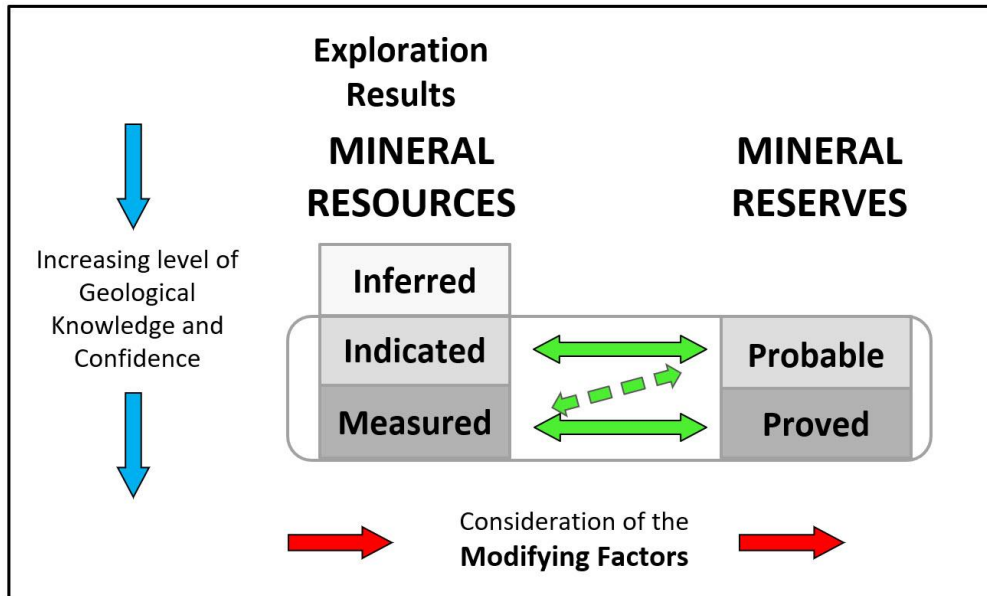
**UNFC is not designed for reporting Mineral Resources and Ore Reserves for public disclosure (No Securities Recognition). No guidance on reporting mineral projects!**

The classification system is aligned to the requirements of the 2030 Agenda for Sustainable Development.

It provides a single framework on which to build international energy and raw material studies and policies, support government resource management policies, plan industrial processes innovation and allocate capital efficiently.



# CRIRSCO Classification



General Relationships between Exploration Results, Mineral Resources and Mineral Reserves, as set out in the CRIRSCO Template (CRIRSCO, 2019)

- The CRIRSCO Standard Definitions include the terms **Mineral, Public Reports, Competent Person, Exploration Target** and three types of technical study, namely: **Scoping Study, Pre-Feasibility Study, and Feasibility Study**.
- Preliminary consideration of the **Modifying Factors** is necessary to confirm that mineralisation included in a Mineral Resource estimate has **reasonable prospects for eventual economic extraction (RPEEE)** based on the relevant Modifying Factors.
- Modifying Factors are considerations which must be accounted for when converting Mineral Resources to Mineral Reserves.



## In the minerals sector the UNFC can be applied in two slightly different ways, namely:

### Classification of estimates of a specified volume on an individual minerals project

- In this context the UNFC provides a framework for **reporting estimates in a standardised manner** to facilitate the incorporation of such estimates into **mineral inventory databases** held by companies, government bodies or other interested parties.

### Classification of minerals projects

- In this context the UNFC provides a framework for **comparing raw materials projects** across the spectrum from exploration to extraction, processing, and recycling.



# III. Mapping the CRIRSCO Template to the UNFC Categories and Sub-categories

## Minerals Projects

*CRIRSCO-UNFC Bridging Document, No. 23-24*

- In the UNECE (2021) Minerals Project is defined as follows: “*A minerals project is a defined **development or operation which provides the basis for environmental, social, economic, and technical evaluation and decision-making**. A minerals project produces mineral products from a mineral source with defined frame conditions, which provide the basis for environmental-socio-economic evaluation and decision-making*”.
- “*A minerals project **comprises a defined activity or set of activities**, which provide the basis for estimating environmental-socio-economic viability including costs and potential revenues associated with its implementation*”.
- Although the term ‘project’ is mentioned frequently **in the CRIRSCO Template the term is not specifically defined.**



## C. Competency and Qualification requirements

*CRIRSCO-UNFC Bridging Document, No. 20-22*

### CRIRSCO Template – Competent Person

**Qualification requirement:** A Competent Person is a minerals industry professional, who is a [National Reporting Organisation (NRO) to insert appropriate membership class and name of Professional Organisation (PO)] or other Recognised Professional Organisations (RPOs) with enforceable disciplinary processes including the powers to suspend or expel a member.

**Experience requirement:** A Competent Person must have a minimum of five years relevant experience in the style of mineralisation or type of deposit under consideration and in the activity which that person is undertaking.(CRIRSCO, 2019)

### Qualified Expert

**Qualified Expert** is an independent person with education, training, and relevant professional experience in a discipline pertinent to a Project, acting in compliance with the professional standards of competence and ethics established by his/her professional organization. This person is responsible for the standards and methodologies used for collecting, analyzing, and verifying information used in qualified assessments.

<https://unece.org/unfc-and-competent-persons-0>



# C. Competency and Qualification requirements

*CRIRSCO-UNFC Bridging Document, No. 20-22*

CP/QP

- Industrial professional
- Independent or non-independent (companies or consultants)
- Relevant experience in deposit type or style of mineralisation
- Technical Disclosure (sign off)
- Personal liabilities
- Project-level (company-level reporting to investors and mining authorities)

QE

- Geoscience professional
- Independent (Geological Surveys, Mining Authorities)
- Relevant experience in ore geology, mining industry, ESG, company reporting, national accounting, regulations
- Resource information conversions/bridging/accounting, no technical disclosure
- National-level (country-level reporting/communication to ministry and EU)



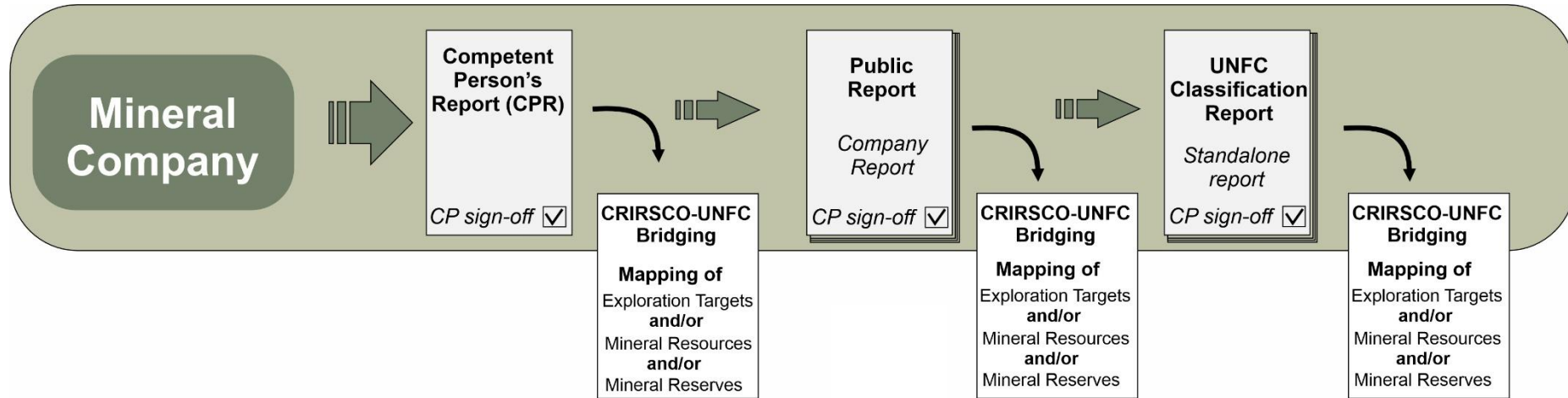
## C. Competency and Qualification requirements

### *CRIRSCO-UNFC Bridging Document, No. 20-22*

- When mapping estimates from the CRIRSCO Template to UNFC, based on information contained in a report prepared by a CRIRSCO Competent Person (CP), the following considerations need to be satisfied:
  - *The CP has familiarized themselves with UNFC and the CRIRSCO-UNFC Bridging Document and is satisfied that they have sufficient experience to carry out the mapping; and*
  - *The independence and objectivity requirements are satisfied, meaning that the CP does not have a potential conflict of interest concerning the purposes for which the UNFC classification is being prepared.*
- **If the same Competent Person (CP)** handles both the mapping of the CRIRSCO estimate to UNFC and the original estimate in a Competent Person's Report (CPR), **a separate detailed report isn't necessary**. However, it's recommended to **include a separate section or appendix** detailing the responsibilities, procedures, and outcomes. Alternatively, these details can be provided in a **separate standalone document** approved by the CP.



# Mapping from the CRIRSCO Template to UNFC







# C. Competency and Qualification requirements

Guidance Note on Competency Requirements (2022), 7-18

## Qualified Experts

- **Professional qualification**
  - *training and experience to enable them to exercise prudent professional judgment and to be in responsible charge of the estimation, classification or management of resources information.*
- **Independence and objectivity**
  - *needs to maintain high standards of independence and objectivity. Each report containing resource information must include a statement of independence.*
- **Accuracy and Reliability**
- **Records and documents**

<https://unece.org/unfc-and-competent-persons-0>

### Template for a Statement of a Qualified Expert

[Date]

[Entity]

[Address]

I, [name] do hereby certify that:

1. I am [consultant/employee] of:

[Entity]

[Address]

2. I have made the estimates of resources as of [dates] set forth in the accompanying [table/report/public disclosure] with respect to the [project] of [Entity]. My examination included such tests and procedures as were considered necessary under the circumstances to render the opinion set forth herein. As of the date of this statement, to the best of my knowledge, information and belief, this Qualified Assessment contains all the scientific and technical information that is required to ensure that it is not misleading.

3. I graduated with a [degree] from the [university] in [year]. In addition, I have obtained a [degree] from the [university] in [year].

4. I am a [professional title] with the [Professional Association or Statutory Body/Government Authority].

[alternatively] 4. I do not have a professional title and I am not registered with a Professional Association/Statutory Body/Government Authority for the following reasons: [stated reasons].

5. I have worked as a [professional qualification] for a total of [years], during which time I have conducted reviews and audits on numerous projects covering [resources/commodities and deposit/reservoir types].

6. I have read the definition of a "Qualified Expert" set out in the United Nations Framework Classification for Resources and certify that by reason of my education, affiliation with a Professional Organisation and past relevant work experience, I fulfil the requirements to be a "Qualified Expert" for the purposes of the United Nations Framework Classification for Resources.

7. I visited the [project] on [dates] (or, alternatively, [I have not visited the project because (explain reason)]).

8. I am independent from the [organisation] that is the subject of the Qualified Assessment.

[alternatively] 8. I meet the requirements of independence and objectivity of a Qualified Expert employed internally by [Entity] as set forth in the UNFC Guidance Note on Competency Requirements for the Estimation, Classification and Management of Resources (ECE/ENERGY/GE.3/2022/4).

9. I am not aware of any material fact or material change with respect to the subject matter of the resources estimates that is not reflected in the Qualified Assessment, the omission to disclose which makes the Qualified Assessment misleading.

10. I consent to the filing of the Qualified Assessment with any authority and any publication, including electronic publication accessible by the public, of the Qualified Assessment.

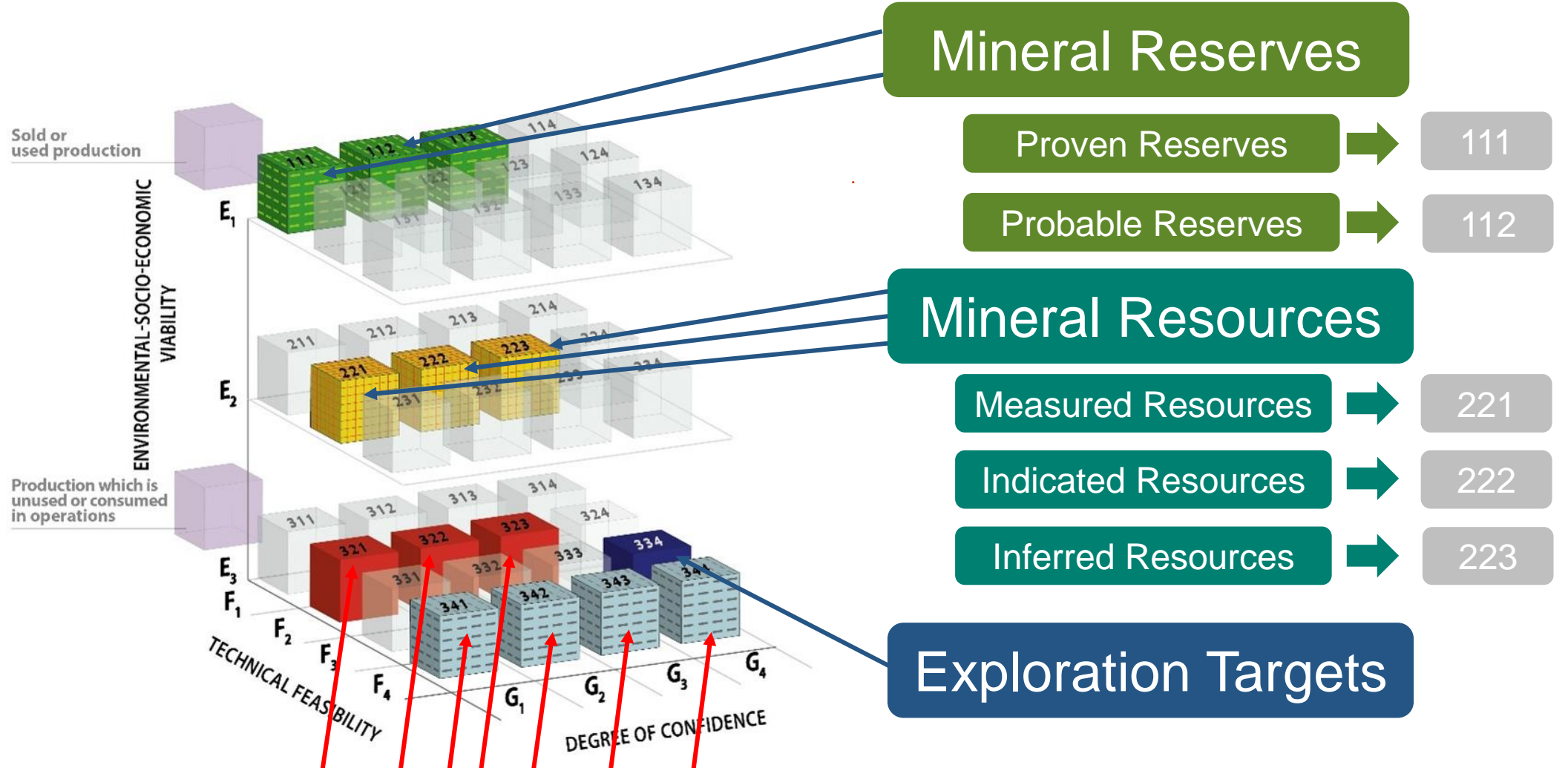
[Date]

"Signed" \_\_\_\_\_

NOTE: Information on qualifications detailed in items 4 and 5 above should be provided on an "if not, why not" basis.



# General relationship between the CRIRSCO and UNFC



Not recognized by the CRIRSCO-aligned standards and codes



# E-axis mapping

## CRIRSCO-UNFC Bridging Document, No. 33-35

Category	Definition	CRIRSCO considerations
E1	Development and operation <u>are confirmed</u> to be environmentally-socially economically viable.	The reported estimates <u>have confirmed</u> prospects for economic extraction under currently realistic assumptions. This may be demonstrated by the results of a FS or the LoMP for an operating mine ....
E2	Development and operation <u>are expected</u> to become environmentally-socially-economically viable in the foreseeable future.	The reported estimates <u>have reasonable prospects</u> for eventual economic extraction based on a preliminary judgement with respect to reasonably assumed Modifying Factors (including ESG aspects). This should be based on the results of studies carried out at Pre-Feasibility or Scoping study levels.
E3	Development and operation are <u>not expected</u> to become environmentally-socially- economically viable in the foreseeable future <b>OR</b>	The reported estimates <u>do not have reasonable prospects</u> for eventual economic extraction based on an initial consideration of reasonably assumed Modifying Factors (including ESG aspects)... <b>[OR]</b>
	evaluation is at <u>too early a stage</u> to determine environmental-socio-economic viability.	[There is a ] <u>lack of sufficient information</u> to complete a reliable assessment.



# F-axis mapping

## CRIRSCO-UNFC Bridging Document, No. 36-39

Category	Definition	CRIRSCO considerations
F1	Technical feasibility of a <u>development project has been confirmed.</u>	<u>Feasibility Study or Operating Mine (Life of Mine Plan).</u> ....
F2	Technical feasibility of a <u>development project is subject to further evaluation.</u>	<u>Pre-Feasibility Study or Scoping Study Report, or a Public Report on a Mineral Resource Estimate.</u> ...
F3	Technical feasibility of a development project <u>cannot be evaluated</u> due to limited data.	A Public Report on <u>Exploration Results</u> which includes an estimate(s) of an Exploration Target(s).
F4	No development project has been <u>identified.</u>	A Public Report on an <u>exploration opportunity</u> which includes <u>historical estimate(s) and/or estimates of Exploration Target(s).</u>



# G-axis mapping

## CRIRSCO-UNFC Bridging Document, No. 40

Category	Definition	CRIRSCO considerations
G1	Product quantity associated with a project that can be estimated with a <u>high level of confidence.</u>	Corresponds with a <u>Measured Resource or Proved Reserve</u> category of confidence.
G2	Product quantity associated with a project that can be estimated with a <u>moderate level of confidence.</u>	Corresponds with an <u>Indicated Resource or Probable Reserve</u> category of confidence.
G3	Product quantity associated with a project that can be estimated with a <u>low level of confidence.</u>	Corresponds with an <u>Inferred Resource</u> category of confidence. In certain situations, Exploration Targets may be assigned to this category.
G4	Product quantity associated with a Prospective Project, estimated <u>primarily on indirect evidence.</u>	Corresponds with the CRIRSCO <u>Exploration Target</u> which is a statement or estimate of exploration potential for a mineral deposit where there has been insufficient exploration to estimate Mineral Resources. Exploration Targets must be expressed as a range of quantity and quality.





# Technical Studies

*Guidance Note on the use of the CRIRSCO-UNFC Bridging Document, No. V. B. 4., p.15*

	F1	F2	F3	F4
E1				
E2				
E3.1				
E3.2				
E3.3				

Simplified representation of the E-F matrix showing UNFC project classification with mapping to CRIRSCO categories.

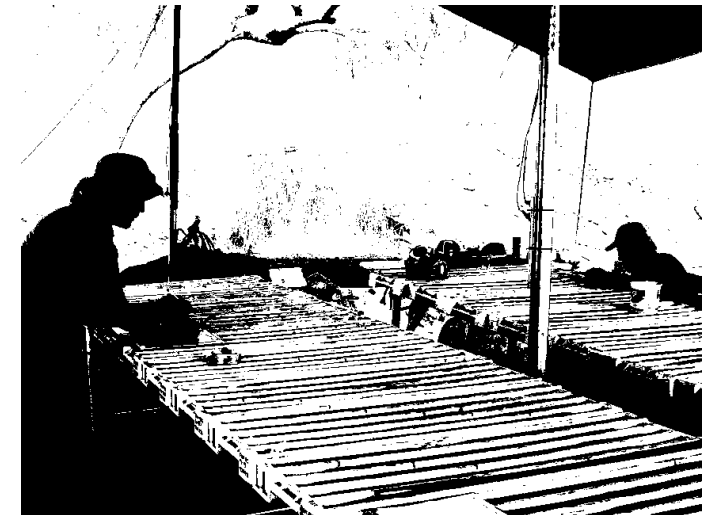
LEGEND	UNFC	CRIRSCO
	Viable Projects	Mineral Reserves (based on a Feasibility Study or the life of mine plan for an operating mine)
	Potentially Viable Projects	Mineral Reserves (based on a Pre-Feasibility study) or Mineral Resources (reported as exclusive of Mineral Reserves)
	Non-Viable Projects	Estimates cannot be publicly reported
	Prospective Projects	Exploration Targets (estimates must be reported as range of tonnages and a range of grades or quality)
	Not normally used	Estimates cannot be publicly reported



# Exploration Results

*CRIRSCO-UNFC Bridging Document, No. 46*

- **Exploration Results** include data and information generated by exploration programmes, but which are not part of a formal declaration of Mineral Resources and Mineral Reserves (CRIRSCO Template, 2019).
- **Exploration Results** emanate from the early stages of exploration when the quantity of data available is generally not sufficient to allow any reasonable estimates of tonnage and grade or quality to be made.
- Consequently, they **do not have an equivalent in UNFC** and cannot be assigned a UNFC classification code.
- Spatially located information contained in such reports may be of interest to capture in government databases of mineral occurrences or drillhole data.









# Exploration Target

*CRIRSCO-UNFC Bridging Document, No. 42-45*

- When converting an estimate of an Exploration Target to the UNFC, it is recommended that the following procedure is used.

For an Exploration Target expressed as:

- Estimated tonnage ranging from  $T_{min}$  to  $T_{max}$
- Estimate grade ranging from  $G_{min}$  to  $G_{max}$  (expressed as a percentage, grammes per tonne or parts per million).

The following estimates of contained product quantities can be obtained:

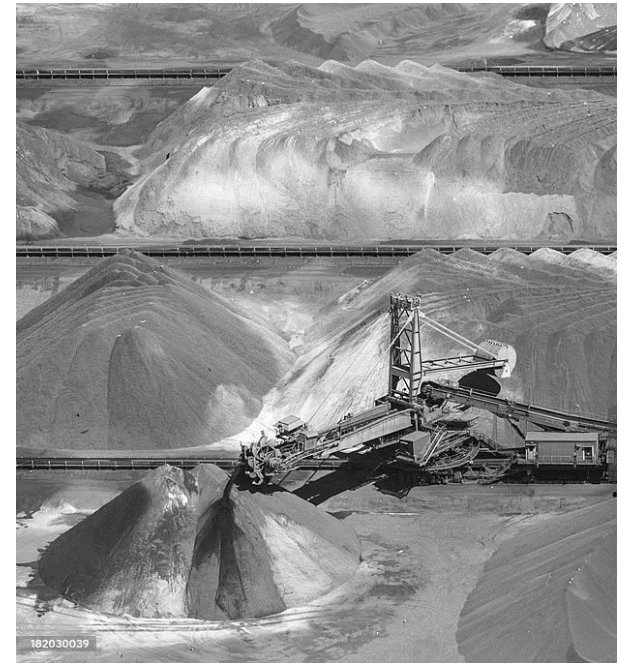
- Minimum estimated contained product quantity:  $Q_{min} = T_{min} * G_{min}$
- Maximum estimated contained product quantity:  $Q_{max} = T_{max} * G_{max}$
- Average estimated contained product quantity:  $Q_{av} = 0.5 * (Q_{min} + Q_{max})$



# Non-Viable Projects

*CRIRSCO Template 2019, 7.2 and 7.3 Guidance Note*

- Non-viable projects (as defined under UNFC) cannot be publicly reported in CRIRSCO Template aligned codes and standards. **Estimates for prospective projects can only be reported as Exploration Targets.**
- These are Project **without** reasonable prospects for eventual economic extraction (RPEEE) or
- **potential** future recovery by mining operations, but where **development is uncertain**, or development is **currently assessed as not Viable**.



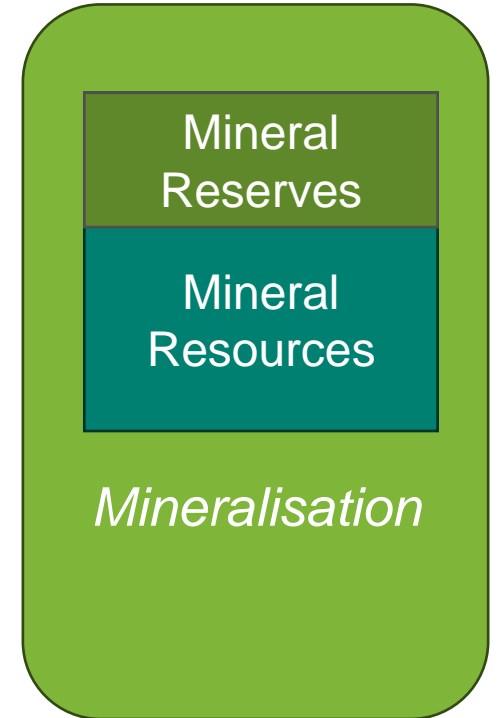


# Mineral Inventory

## CRIRSCO Template 2019, 7.2 and 7.3 Guidance Note

- The term ‘*reasonable prospects for eventual economic extraction*’ implies a judgement (albeit preliminary) by the Competent Person in respect of all Modifying Factors.
- **a Mineral Resource is not an inventory of all mineralisation** drilled or sampled, regardless of cut-off grade, likely mining dimensions, location or continuity.
- It is a **realistic inventory of mineralisation**, which, under assumed and justifiable technical and economic conditions, **may**, in whole or in part, **become economically extractable**.

- *Certain reports (e.g., inventory reports, exploration reports to government and other similar reports not intended primarily for providing information for investment purposes) may require full disclosure of all mineralisation, including some material that does not have reasonable prospects for eventual economic extraction. Such estimates of mineralisation would not qualify as Mineral Resources or Mineral Reserves under the definitions included in the Template.*



**CRIRSCO Template 2019**



# Mineral Inventory

*CRIRSCO-UNFC Bridging Document, No. 47-48*

- Where adequate geological studies have been carried out but a preliminary judgement on all the Modifying Factors indicates that a project is **not viable in the foreseeable future** (i.e., it does not have “reasonable prospects for eventual economic extraction”), the mineralization is classified as “inventory” and is **not converted** to a Mineral Resource.
- **Note! “Inventory” is not a defined term in the CRIRSCO Template, and such quantities may not be disclosed in a Public Report (as defined in the CRIRSCO Template)**
- Classifications of “inventory” should be **reviewed periodically** to determine whether the classifications should be altered to **take account of changes** in environmental, social or economic criteria and assumptions.

Category	Definition
E3F2 (E3.3, F2.3)	where the quantities are technically recoverable but are not expected to become environmentally-socially-economically viable in the foreseeable future
E3F2 (E3.2, F2.2)	where the quantities are technically recoverable but where economic viability cannot yet be determined due to insufficient information, or
E3F4 (E3.3)	where no technically viable development project or mining operation can be identified.



# Re-classification when conditions change

## CRIRSCO-UNFC Bridging Document, No. 47-48

7.21 In a Public Report of a Mineral Resource for a project material to the company, when reporting for the first time, or when those estimates have materially changed from when they were last reported, a brief summary of the information in relevant sections of Table 1 must be provided. Alternatively, if a particular criterion is not relevant or material, a disclosure that it is not relevant or material and a brief explanation of why this is the case must be provided.

8.1 A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource.

It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors.

8.18 In situations where figures for both Mineral Resources and Mineral Reserves are reported, a statement must be included in the report which clearly indicates whether the Mineral Resources are inclusive of, or additional to the Mineral Reserves.

8.19 Mineral Reserve estimates must not be added to Mineral Resource estimates to report a single combined figure.

8.20 If re-evaluation indicates that any part of the Mineral Reserves is no longer viable, such Mineral Reserves must be re-classified as Mineral Resources and be removed from the Mineral Reserve statements.

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

If re-evaluation indicates that any part of the Mineral Reserves is no longer viable, such Mineral Reserves must be re-classified as Mineral Resources and be removed from Mineral Reserves statements.

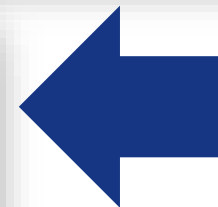


## INTERNATIONAL REPORTING TEMPLATE

for the public reporting of

EXPLORATION TARGETS, EXPLORATION RESULTS, MINERAL RESOURCES AND MINERAL RESERVES

November 2019





# Historic estimates

## CRIRSCO-UNFC Bridging Document, No. 52

- Estimates of Mineral Resources or Mineral Reserves that were made by a previous owner or operator of a mineral property and which **have not yet been verified** by the present owner or operator as following the requirements of the CRIRSCO Template.
- The term historical (or historic) estimate is not used in the CRIRSCO Template, however, the term is used in the context of stock exchange reporting.
- The term can also be used to refer to estimates in historical reports about a mineral project which is currently not being actively explored.
- When applying the Bridging Document, the unverified historical estimates will **generally** be downrated to **E3** and **F3**, with the original G categories being retained.

### Goldfields – Historical Mineral Resources and Reserves



Project	Category	Classification	Deposit	Cut-off (g/t)	Tonnes (000's)	Au Grade (g/t)	Au (oz)
Goldfields, Saskatchewan <sup>1,2,3,5</sup>	Mineral Reserves <sup>4</sup>	Proven & Probable	Box	0.33	16,502	1.51	800,000
			Athona	0.33	5,831	1.17	220,000
			<b>Total</b>	<b>0.33</b>	<b>22,333</b>	<b>1.42</b>	<b>1,020,000</b>
	Mineral Resources	Measured & Indicated	Box	0.5	13,824	1.66	737,000
			Inferred	0.5	3,158	1.74	176,000
		Indicated	Athona	0.5	7,036	1.28	290,000
			Inferred	0.5	1,406	1.10	50,000
		<b>Measured &amp; Indicated</b>	<b>Total</b>	<b>0.5</b>	<b>20,860</b>	<b>1.53</b>	<b>1,027,000</b>
			Inferred	<b>Total</b>	<b>0.5</b>	<b>4,564</b>	<b>1.54</b>

Notes:  
 1. The mineral resource and reserve estimates for Goldfields are considered historical in accordance with NI 43-101. See following page regarding important disclosures regarding historical estimates.  
 2. The mineral resource and reserve estimates for the Goldfields project are contained in the Technical Report titled "NI 43-101 Technical Report Pre-Feasibility Study, Brigus Gold Corp., Goldfields Project, Saskatchewan, Canada" with an effective date of October 6, 2011 (the "2011 PFS Technical Report"), completed by March Consulting Associates, Inc. in cooperation with Norberg Wiersma Terra Tech, Dan Mackie Associates (DMA) and IBA Engineering Ltd. The 2011 PFS Technical Report was issued to Brigus Gold Corp. ("Brigus") and subsequently re-issued to successor company, Fortune Bay Corp. on March 13, 2014. The full 2011 PFS Technical Report is filed on SEDAR ([www.sedar.com](http://www.sedar.com)) under the Brigus' issuer profile.  
 3. The Goldfields Athona deposit mineral resource estimates incorporated into the 2011 PFS report were extracted from a previous NI 43-101 Technical Report titled "Technical Report on the Athona Deposit, SK" with an effective date of May 17, 2007, completed by Norberg Wiersma Terra Tech and issued to GLR Resources Ltd., who were the operators of the Goldfields project at the time. No additional drilling or evaluation work was completed on Athona between 2007 and 2011.  
 4. Proven and Probable mineral reserves are the economically mineable parts of the combined Measured and Indicated mineral resources, based on an assessment (2011 PFS Technical Report) of the technical and economic viability of the mineral resources.  
 5. Numbers may not add due to rounding.

Source: Chrome extension://efaidnbmnnnibpcajpcglclefindmkaj/https://fortunebaycorp.com/files/202008\_Goldfields\_MineralResourcesReserves.pdf

### Typically included with a following Cautionary Statement:

Company is not treating the foreign estimate as current mineral resources or reserves and considers the foreign estimate to represent an exploration project that requires verification. The foreign estimate is considered to be a useful guide to exploration but the Company is not treating the foreign estimate as current mineral resources or ore reserves as defined by the JORC Code.





# Historic estimates

## Outdated Resource estimate ('Ownership change')

In situations where resources were reported in accordance with CRIRSCO-reporting system several year ago (>10 y/o) and since then company has left the project and the possible new owner has **not released a new resource nor confirmed the old resource**.

Companies reports/treats these as 'historical estimate' (NI43-101) or 'foreign estimate' (ASX listing rules) which do not represent a Mineral Resource.

- *a qualified person has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves;*
- *Include a statement that the issuer is not treating the historical estimates as current mineral resource or mineral reserves.*

In such a case, the project must be looked at as non-active => Change from **221, 222, 223** to **E3.2;F2.2;G1,2,3** or to **E3.3;F2.3;G1,2,3** (=> compliant → non-compliant resource).

For further information see UNFC Guidance Europe (Annex II, Viable Projects Turn Non-Viable, p. 29)



# Historic estimates and closed or closing mining operations

## *Guidance Note on the use of the CRIRSCO Template-UNFC Bridging Document, G.9*

- In situations where a mining operation is nearing the end of its planned life or has been put on prolonged care and maintenance due to adverse economic or operating circumstances, the mapping of published Mineral Resources and Mineral Reserves may need to be revised accordingly.
- Where a planned mine closure is underway, a company will be mining out the remaining Mineral Reserves and not converting any additional Mineral Resources into Mineral Reserves.

Once the mine closes and enters a closure monitoring phase, such material would no longer satisfy the requirements for RPEEE and would represent non-viable quantities which should be classified as **E3.3; F2.3; G1, G2 or G3**.

During the period where a mine is transitioning to closure, or is on prolonged care and maintenance, the project would be classified as **E3.2; F2.2**.

Subsequently, if it is decided to investigate a closed mine with a new development concept, the project might be classified as **F2.1 or F3.1**.







# Technical Studies

## *CRIRSCO-UNFC Bridging Document, No. 30-31*

- Technical studies (**Scoping**, **Pre-Feasibility** and **Feasibility**) should be mostly viewed as projects where project's environmental-socio-economic viability and/or technical feasibility has yet to be confirmed (UNFC: **E2;F2**)
- The existence of **an operating mine**, or the **completion of a positive Feasibility Study**, is required to meet the requirements for viable projects (**F1** and **E1** where the project's environmental-socio-economic viability and technical feasibility **have both been confirmed**).
- UNFC Category **F2** Definition is as follows: *“Technical feasibility of a development project is subject to further evaluation.”*
- Positive technical feasibility means that there is no technical or non-technical contingencies or hurdles which prevent mining and production (Reasonable Prospects for environmental-socio-economic viability in the Foreseeable Future).



# Table 2

Standard mapping of CRIRSCO Template aligned estimates to UNFC categories.

CRIRSCO Template			Corresponding UNFC category <sup>(a)</sup>			UNFC Class
Public Report and Study Types	Standard Definitions					
Feasibility Study or Life of Mine Plan (for an operating mine)	Mineral Reserves	Proved	E1	F1	G1	Viable Projects
		Probable			G2	
Pre-feasibility Study <sup>(b)</sup>	Mineral Reserves	Proved	E2	F2	G1	Potentially Viable Projects
		Probable			G2	
Feasibility Study, Life of Mine Plan (for an operating mine) or Pre-feasibility Study <sup>(c)</sup>	Mineral Resources (exclusive of Mineral Reserves)	Measured	E2	F2	G1	Potentially Viable Projects
		Indicated			G2	
		Inferred			G3	
Scoping Study report or other Public Report on a Mineral Resource estimate <sup>(d)</sup>	Mineral Resources	Measured	E2	F2	G1	Potentially Viable Projects
		Indicated			G2	
		Inferred			G3	
Public Report on exploration stage projects	Exploration Target		E3	F3	G4	Prospective Projects
	Exploration Results	Estimates not published				
Not applicable <sup>(e)</sup>	Estimates obtained from historical reports <sup>(f)</sup>				Non-viable Projects	

**2015 version**

CRIRSCO Template		UNFC-2009 "minimum" Categories			UNFC-2009 Class
Mineral Reserve	Proved	E1	F1	G1	Commercial Projects
	Probable			G2	
Mineral Resource	Measured	E2	F2	G1	Potentially Commercial Projects
	Indicated			G2	
	Inferred			G3	
Exploration Target		E3	F3	G4	Exploration Projects



# Technical Studies

*CRIRSCO-UNFC Bridging Document, No. 30-31*

UNFC F axis (UNECE, 2021)		CRIRSCO Template (2019)
Category	Definition	Technical study type
F1	Technical feasibility of a development project has been confirmed.	Feasibility Study or Operating Mine (Life of Mine Plan with no material changes to the operation). For CRIRSCO Template aligned reporting it is expected that the results of such studies should meet the requirements given for E1 in Table V.2.
F2	Technical feasibility of a development project is subject to further evaluation.	Pre-Feasibility Study or Scoping Study Report, or a Public Report on a Mineral Resource Estimate. For CRIRSCO Template aligned reporting it is expected that the results of such studies should meet the requirements given for E2 in Table V.2.
F3	Technical feasibility of a development project cannot be evaluated due to limited data.	A Public Report on Exploration Results which includes an estimate(s) of an Exploration Target(s).
F4	No development project has been identified.	A Public Report on an exploration opportunity which includes historical estimate(s) and/or estimates of Exploration Target(s).

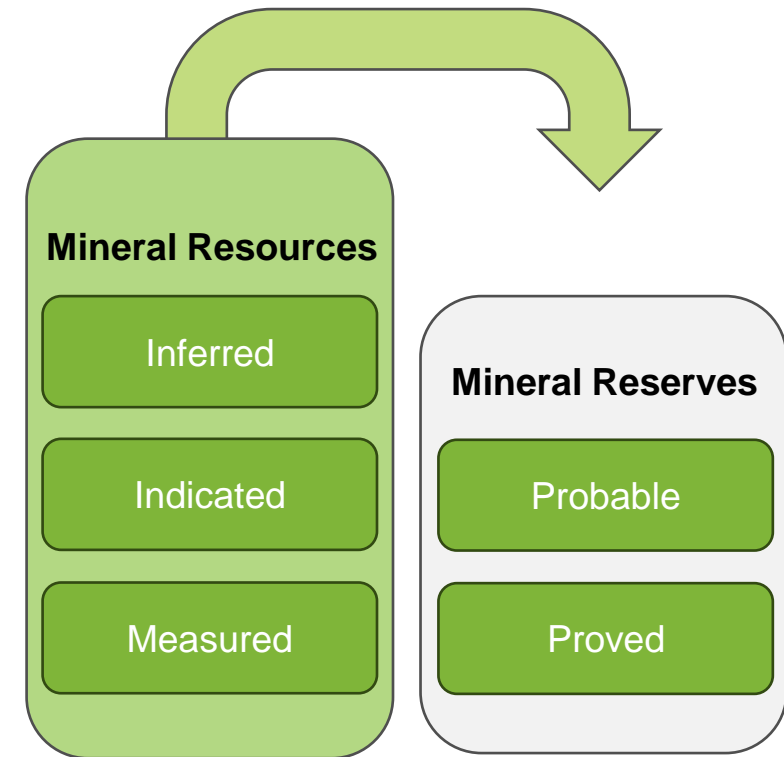


# Mineral Resources inclusive of Mineral Reserves

## CRIRSCO-UNFC Bridging Document, No. 28

- Where the Mineral Resources have only been reported as inclusive of Mineral Reserves, then these Mineral Resource estimates **should not be mapped to the UNFC** as it would result in double counting of product quantities for that particular project.
- This means that Mineral Reserves can only be mapped, not Mineral Resources!
- When Mineral Resources are reported inclusive of the Mineral Reserves it **does not allow a viewpoint to individual categories defined by UNFC**.

For example, Boliden states that: *“Boliden reports Mineral Resources excluding Mineral Reserves to avoid double counting the same tonnage. This means quantities converted to Mineral Reserves are deducted from Mineral Resources.”*





# Mineral Resources reported exclusive of Mineral Reserves

*CRIRSCO-UNFC Bridging Document, No. 49-50*

- In UNFC, estimates in classes such as 221 are **always exclusive of other classes**, such as 111, to avoid double-counting of quantities (tonnages or volumes). Where classes are aggregated, this **must be documented explicitly** (e.g., 111 + 221).
  - *Under the CRIRSCO rules, for Public Reporting, aggregation of Mineral Resources and Mineral Reserves is **not permitted**. Reporting of aggregated total Mineral Resources or total Mineral Reserves is only permitted provided that the estimates for the individual confidence categories are also reported at the same time.*
  - *The CRIRSCO Template allows for both Mineral Resources and Mineral Reserves to be reported for a project at the same time. Such reports must include a statement which clearly indicates whether the Mineral Resources are inclusive of, or exclusive of (i.e. additional to), the Mineral Reserves.*
- When assigning UNFC codes to such estimates, **only the estimates for Mineral Resources reported exclusive of Mineral Reserves should be used to avoid double counting of the estimated volumes.**



# Effective Date

## *CRIRSCO-UNFC Bridging Document, No. 51*

- Both UNFC and the CRIRSCO Template require the **Effective Date** to be stated when any estimate of quantities is published.
- When applying the Bridging Document, **it would normally be expected that the Effective Date of both estimates would be the same.**
- **If not**, then an assessment would need to be carried out to determine whether any new information (e.g., changes in costs and prices, changes in permitting status) has become available after the original Effective Date which could have significantly changed the estimate as at the Effective Date. Should this have occurred then the likely effect that such new information would have on the previously reported estimate must be included in the report.

and Mineral Reserves at 31 December 2022. The Mineral Resources and Mineral Reserves have been prepared and reported according to the requirements of S-K1300.

### **Effective Date**

[§229.1302(b)(iii)(3)]

The effective date of the TRS is 31 December 2022, which satisfies the S-K1300 requirement of a current report.

### **Property description, Mineral Rights and ownership**



## Effective Date

*Guidance Note on the use of the CRIRSCO Template-UNFC Bridging Document, H., p. 27-29*

- Where **more than 2-3 years** have elapsed since the effective date for the original estimate, the classification should be reviewed in order to determine whether any material changes have occurred since that date (e.g., an operating mine closing, revoking of a mineral permit, or dramatic commodity price changes, etc.).
- In such cases, it may be necessary to adjust the E and F categories that are assigned.
- In cases where one or more of the Modifying Factors has a lower confidence than the level of geological confidence then the value assigned to the UNFC G axis should be downgraded to a lower confidence Category in order to reflect the lower level of confidence in the estimate.



# Reference Point

## *Guidance Note on the use of the CRIRSCO Template-UNFC Bridging Document, G.2*

- UNFC specifies the **reference point** as a “*defined location within a development at which the reported estimate or measurement is made*” and requires that it “*shall be disclosed in conjunction with the classification*”.
- The reference point “*may be the sales, transfer or use point from the development or it may be an intermediate stage, in which case the reported quantities account for losses prior to but not subsequent to the delivery point.*”
- Consequently, when preparing **mineral information databases** using UNFC classifications, it is **important that details of the reference point are captured together with the estimates and their associated UNFC categories.**





# Reference Point

## Guidance Note on the use of the CRIRSCO Template-UNFC Bridging Document, G.2

- In CRIRSCO the corresponding reference point for **Mineral Resources** is ‘in situ’ or ‘in place’.
- Estimates of **Mineral Reserves** are defined with respect to a specified reference point, “**usually the point where the ore is delivered to the processing plant**”, which must be stated in the accompanying report.
- Whenever Mineral Reserves reference points vary from delivery points to processing plants, as in estimating saleable product quantities for customer delivery, accompanying **clarifying statements** must explain the distinction for reader comprehension.

	Tuoreetsaaret	1.2
<b>Total Inferred</b>		<b>2.8</b>
<b>Total Mineral Resources</b>		<b>6.7</b>

Notes:

1. Mineral Resources are reported exclusive of Mineral Reserves derived from them.
2. The reference point for Mineral Resources are in -situ material.
3. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.
4. Mineral Resource are reported above an economic cut-off calculated for each deposit.
5. All figures are rounded to reflect the relative accuracy of the estimates.
6. Note the Mineral Resource tabulation reports the % Li and not % Li<sub>2</sub>O. Contained Lithium is re (LCE)

	Outovesi	0.2
<b>Total Probable</b>		<b>4.9</b>
<b>Total Mineral Reserve</b>		<b>8.2</b>

Notes:

1. Cut-off for open pit reserves 0.40% Li<sub>2</sub>O
2. Price EUR23 667/t LiOH.H<sub>2</sub>O
3. The reference point for Mineral Reserves are material delivered to the mill.
4. Measured material converted to Proven
5. Indicated Material Converted to Probable
6. No Inferred material included in the Mineral Reserve
7. The Rapasaari Mining permit has been granted but is under appeal



# Reporting in accordance with CRIRSCO

## *CRIRSCO-UNFC Bridging Document, No. 54*

- A specific reporting code or standard should always be used for reporting purposes of individual mineral projects to ensure that users properly understand the basis on which such estimates have been prepared.
  - **Objective:** The purpose of reporting a UNFC estimate in compliance with a CRIRSCO Template aligned code or standard should be clarified
  - **Relevant legislation and regulations:** A specific CRIRSCO code or standard recognised by the relevant government legislation or stock exchange regulations must be selected
  - **Competent Person (CP) requirement:** A minerals industry professional(s) who has a qualification that is recognised by the relevant legislation, regulations and reporting code or standard is needed.
  - **Technical Report requirement:** The release of an accompanying Competent Person's Report (CPR) or public reporting may be required which summarises the information and assumptions on which the estimates are based and also discusses any material uncertainties as clear and transparent information.
  - **Types of estimates that can be reported:** CRIRSCO Template aligned codes and standards, do not allow the reporting of estimates for non-viable projects. Estimates for prospective projects can only be reported as Exploration Targets and must be presented as a range of quantities and qualities to indicate the associated uncertainty.



# Guidance Note on the use of the Bridging Document between the CRIRSCO Template and UNFC

I. INTRODUCTION

II. BACKGROUND

III. OVERVIEW OF SYSTEM CONTENTS

IV. COMPETENCY AND QUALIFICATION REQUIREMENTS

V. MAPPING CRIRSCO TEMPLATE TO THE UNFC CATEGORIES AND SUB-CATEGORIES

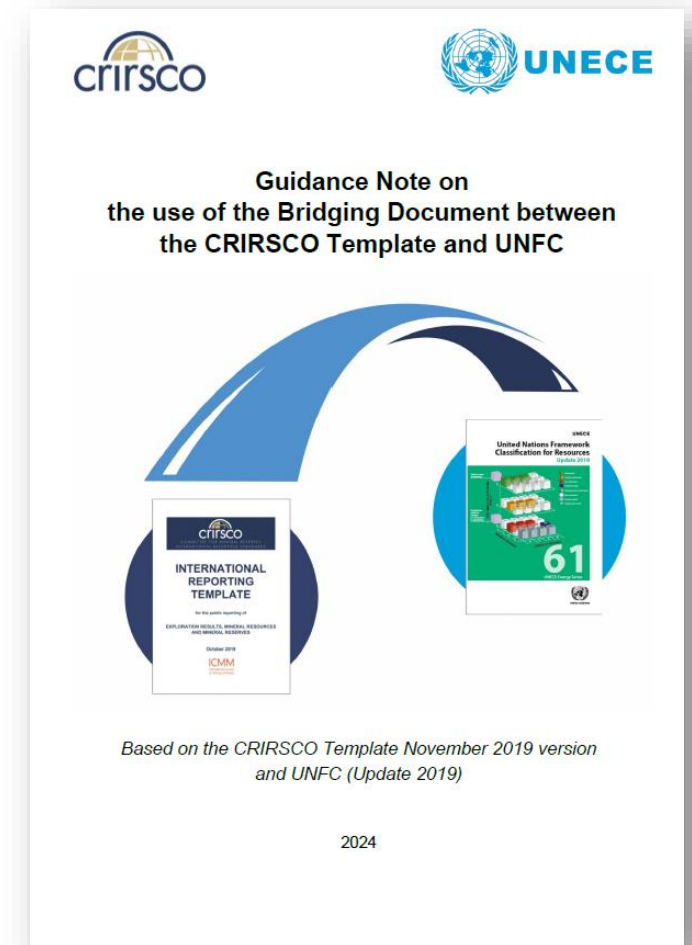
VI. MAPPING UNFC 2019 TO THE CRIRSCO TEMPLATE 2019

VII. REFERENCES

VIII. Appendix I: Key features of the CRIRSCO Template and the UNFC

IX. Appendix II: Terminology

+ 3 Figures and 9 Tables





## Key points and takeaways



- The CRIRSCO-UNFC Bridging Document is used when either **Exploration targets, Mineral Resources** or **Mineral Reserves** have been reported in accordance with CRIRSCO-aligned reporting standards and codes.
- When mapping estimates from the CRIRSCO Template to UNFC, it is **mandatory** to adhere to **competency requirements**.
- Only the estimates for Mineral Resources reported exclusive of Mineral Reserves should be used to avoid double counting of the estimated volumes.
- Technical studies (**Scoping, Pre-Feasibility** and **Feasibility**) should be mostly viewed as projects where project's environmental-socio-economic viability and/or technical feasibility has yet to be confirmed (UNFC: **E2;F2**)

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**When do you need to use the  
CRIRSCO-UNFC Bridging Document?**

① Start presenting to display the poll results on this slide.



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**Thank you for your attention**

Janne Hokka, GTK

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