Reasonable Prospects and Mineral Resource Statements

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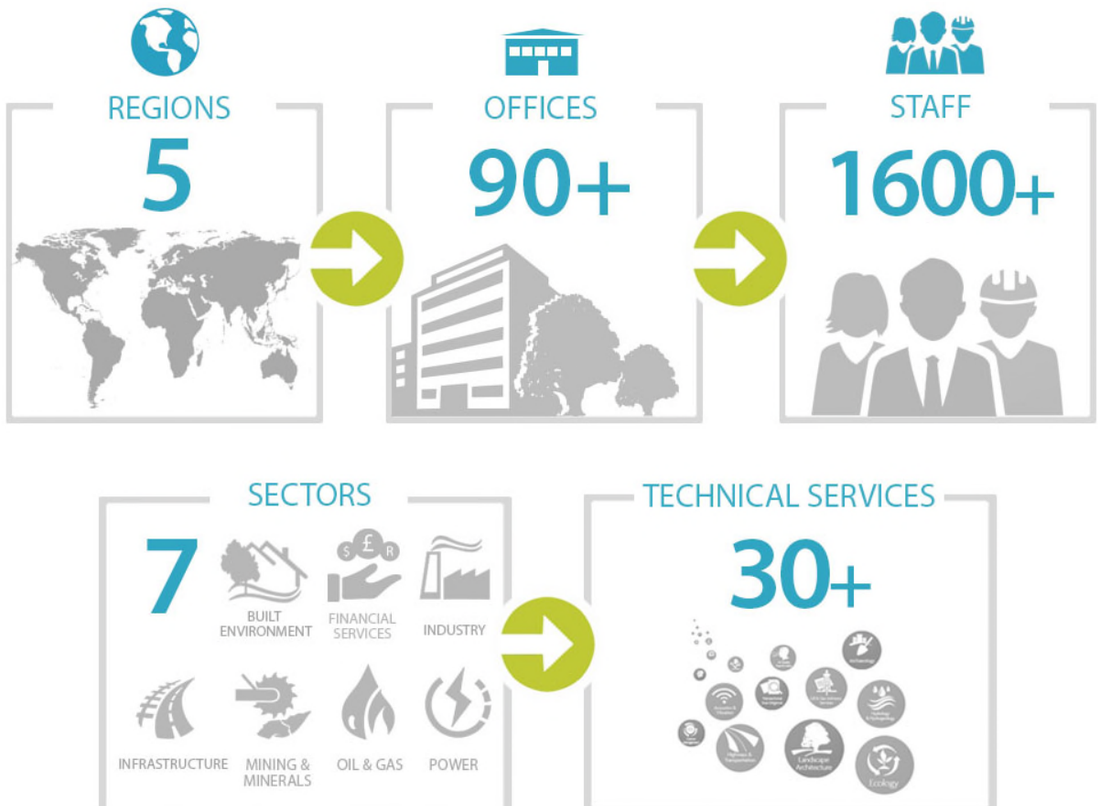

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- All discussions and opinions discussed in this presentation are those of the authors only.

History

CIM Definition Standards (2014) – Mineral Resource

- *"A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the earth's crust in such a 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."*

- The current discussion will focus on "Reasonable Prospects for Eventual Economic Extraction" – RPEEE.

Introduction – Is RPEEE a New Item?

Left to right: Eur Ing Gordon Riddler (IMM), Dr. Ferdie Camisani-Calzelari (SAIMM), David Armstrong (SME), Norman Miskelly (Australasian JORC and CMM), John Postle (CIM), Jean-Michel Rendu (SME), and Dr. Kadri Dagdelon (SME).

Photo courtesy of Gordon Riddler.

- **NO!** In fact the current language represents an evolution that began in 1976 with USGS Bulletin 1450A that provided a definition for a Resource.
- This was followed by USGS Circular 831 (1980) and the JORC Code (1989).
- The first internationally accepted definition occurred at the **Denver Accord in 1997.**
- This was followed by CIM Definition Standard (2000), JORC Code (2004), NI 43-101 (2005), and ultimately CRIRSCO (2012).
- Additional details available in Parker & Dohm, 2014, “Evolution of Mineral Resource Classification from 1980 to 2014 and Current Best Practice.”

CIM Definition Standards - RPEEE

- The RPEEE requirement applies only to Mineral Resources. For Mineral Reserves, the concept is addressed by the requirement of the modifying factors.

- The Definition Standards provide some general guidance on the items for consideration in respect of RPEEE. These include the judgement by the Qualified Person (QP) in respect of the **technical and economic factors** likely to influence the RPEEE.

- In brief, assumptions should include estimates of:

  1. cut-off grade*, and
  2. the geological continuity at the selected cut-off grade.

***Note:** the selection of an appropriate cut-off grade requires consideration of such items as conceptual operational scenario, metallurgical recoveries, metal prices, operating costs, and revenue-based royalties.

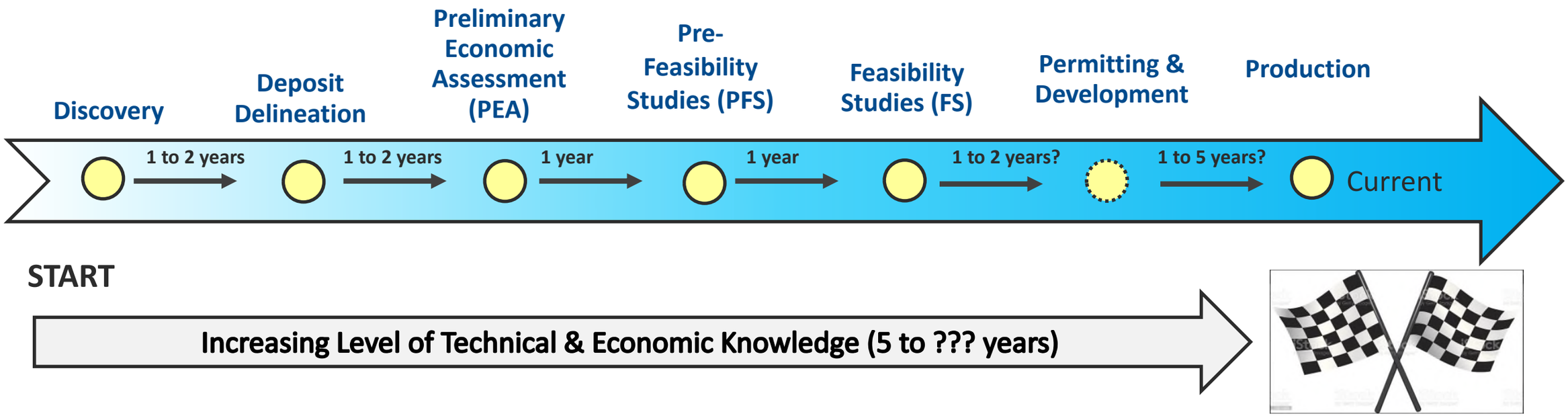
CIM MRMR Best Practices Guidelines - RPEEE

- Additional guidance regarding RPEEE is provided in Chapter 6.12 of the CIM Mineral Resource and Mineral Reserve (MRMR) Best Practices Guidelines:

- *"Factors significant to the technical feasibility and potential economic viability must be considered when preparing Mineral Resource statements. These will include such items as:*
  - *The size and legal conditions of the land tenure sufficient to fully enclose the Mineral Resource,*
  - *The extraction selectivity for the mining methods under consideration relative to the size and geometries of the mineralization interpretations,*
  - *The processing method under consideration, the expected recovery from the mined material to a commercially marketable product and the proposed production volume,*
  - *The price/value of the product and the market for the product at that price, and*
  - *The factors significant to cut-off grades or values (e.g. process recovery, smelter payability, treatment charges, operating costs, royalties, etc.) used for reporting of Mineral Resource estimates."*

- *"For a Mineral Resource, factors significant to technical feasibility and economic viability should be current, reasonably developed, and based on generally accepted industry practice and experience.* ***The assumptions should have a reasonable basis, be clearly defined, and should reflect the level of information, knowledge, and stage of development of the mineral property at the time."***

Key Concept – Mineral Resource Stages



- Mineral Resources are estimated for a variety of situations over time. The level of knowledge, understanding, and information will vary for each stage and changing market conditions.
- In recognition of this evolution in the level of knowledge, reasonable assumptions are often required to enable the estimation of Mineral Resources. The QP should state if the assessment is based on any direct evidence and testing.

Concept – Mineral Resource Assumption Ranges

Item/Stage	Discovery	Delineation	PEA	PFS	FS	Development	Production
Operational Scenario	Exploration target	Conceptual	Preliminary	Advanced	Final	Final	Actual
Metal Prices	Long Term	Long Term	Long Term/Forecast	Forecast/Market	Forecast/Market	Forecast/Market	Current/Budgetary
Metallurgical Recoveries	Comparables	Comparables/ Initial tests	Initial & Supplementary tests	Testing on representative samples	Test work complete	Test work complete	Actuals/Budgetary
Operating Costs – Mining/Excavation	Comparables	Order-of-Magnitude	Preliminary	Detailed Estimates	Final	Final	Actuals/Budgetary
Operating Costs-Processing	Comparables	Order-of-Magnitude	Preliminary	Detailed Estimates	Final	Final	Actuals/Budgetary
Operating Costs-General & Administration	Comparables	Order-of-Magnitude	Preliminary	Detailed Estimates	Final	Final	Actuals/Budgetary

- Reasonable assumptions in relation to Mineral Resource estimates **DO** vary with the stage of the project.
- **IMPORTANT NOTE:** this table is not intended as an exhaustive review – rather intended to illustrate the concept.
- Additional guidance is provided in Chapter 6.12.1 of the CIM MRMR Best Practices Guidelines.

RPEEE – Open Pits

RPEEE – Open Pits (2007 & 2009)

Standards & Guidelines for Resources & Reserves

December 2007/January 2008

Reasonable prospects for economic extraction

These are heady times for the mining industry, with strong metal prices, investor enthusiasm for the junior explorer and ready access to finance for mineral projects. Many projects were shelved in the past because of technical deficiencies — insufficient tonnes or grade, metallurgical problems, the deposit was too deep or too narrow, or the project was physically or economically under water. With the possibility of sustained metal prices, now is the time for those previously "challenged" projects to be re-evaluated and financing sought for continued development. The question is, do these deposits have reasonable prospects for economic extraction, as required by all mineral resource reporting codes?

NI 43-101 defines a mineral resource as that portion of the mineral inventory that has reasonable prospects for economic extraction. However, a mineral resource is not simply an inventory of all blocks above a given cut-off grade. The spatial distribution and geological and grade continuity must also be considered. The qualified person (QP) must consider factors significant to project economics at the mineral resource estimation stage, and not just when qualifying mineral reserves.

CIM Best Practice Guidelines for estimating mineral resources require the factors significant to project economics be current, reasonably developed and based on generally accepted industry practice and experience. In establishing the cut-off grade, it must realistically reflect the location, deposit scale, continuity, assumed mining method, metallurgical processes, costs and reasonable long-term metal prices appropriate for the deposit.

Variations within the resource model (rock characteristics, metallurgy, mining methods, etc.) may necessitate more than one cut-off grade or economic limit in different parts of the deposit model. There must be sufficient knowledge of the metallurgical characteristics of the deposit, which should be supported by preliminary metallurgical test results.

For deposits amenable to open-pit mining methods, a Lerchs-Grossman (LG) pit of measured, indicated and inferred confidence categories (not an optimized and operational pit outline) captures the required considerations of location, deposit scale, continuity and assumed mining method, metallurgical recovery, operating costs and reasonable long-term metal prices. Blocks captured within the pit shell meet the test of "reasonable prospects for economic extraction" and can be declared a mineral resource. Material outside of the pit shell remains as a quantity and grade of a potential mineral deposit, but should not be considered a mineral resource.

An LG pit is not a regulatory requirement, but it quickly captures all of the required inputs under CIM Definition Standards for mineral resources. It is an efficient means by which to assess the reasonable prospects for economic extraction of material that can be mined by open pit methods, as long as the inputs of operating costs, metal prices and metallurgical recoveries are reasonable. Resource geologists without the mine software capabilities can establish an average cut-off grade using preliminary metallurgical recoveries and reasonable operating costs, and then plot the blocks that meet this cut-off grade and visually assess their continuity and mineability. This can be done by visually estimating the maximum depth for an open pit that allows an acceptable strip ratio, with a higher cut-off to cover the cost of mining both ore and waste.

The grade shell method is sometimes the only reasonable approach for mineralization that can be mined underground. If it is a discrete vein, then the resource may be the material in this vein shape that is above the economic cut-off and sufficiently contiguous and thick enough to be mined. Isolated blocks, which could clearly not support underground development to access the blocks, should be removed from the resource inventory.

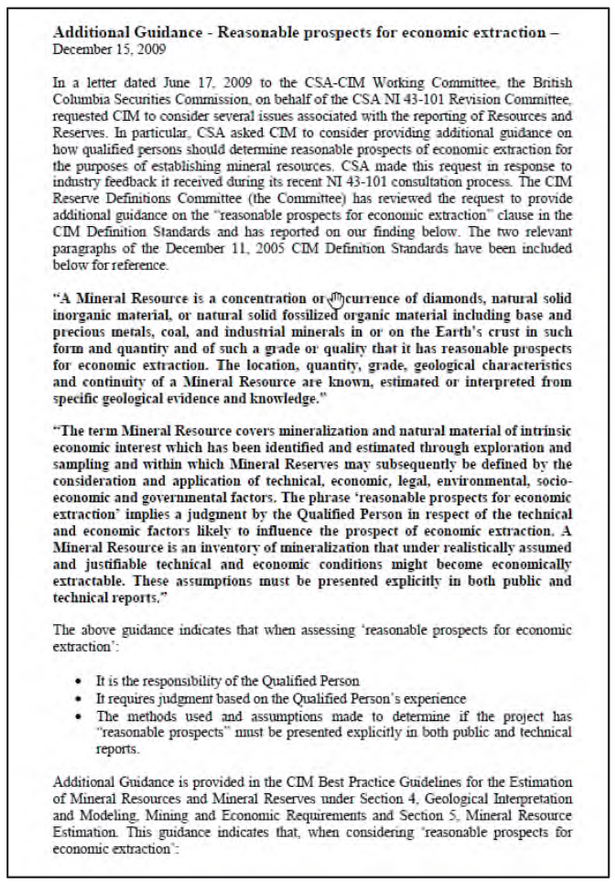
The important thing is to be reasonable (not conservative, or excessively liberal) in the choice of parameters. The resource estimator should try to identify that material that has "reasonable prospects" but may not be reserves at this time.

Finally, a qualified person estimating mineral resources cannot completely ignore capital costs to develop a mineral deposit when assessing reasonable prospects for economic extraction. Economic extraction implies a repayment of capital, at least on a going forward basis. In our opinion, the qualified person should determine the prospects for sufficient revenues from the deposit to cover capital costs, which can be estimated from similar operations. This point is the subject of much active discussion between the members of most resource code committees and will likely will be resolved and codified in the near future.

To accommodate the dynamics of the mining industry, the definition of mineral resources under the reporting codes was chosen to be principle-based and not prescriptive. This allows resource estimators the freedom to make appropriate, experienced-based decisions, but also imposes a responsibility to explain and justify their basis for determining reasonable economics.

About the Authors
Greg Gosson is technical director, geology and geostatistics, AMEC Americas Limited, and Larry B. Smith is group manager, Mining & Metals Consulting, AMEC

https://mrmr.cim.org/en/library/magazine-articles/reasonable-prospects-for-economic-extraction/



Additional Guidance - Reasonable prospects for economic extraction – December 15, 2009

In a letter dated June 17, 2009 to the CSA-CIM Working Committee, the British Columbia Securities Commission, on behalf of the CSA NI 43-101 Revision Committee, requested CIM to consider several issues associated with the reporting of Resources and Reserves. In particular, CSA asked CIM to consider providing additional guidance on how qualified persons should determine reasonable prospects of economic extraction for the purposes of establishing mineral resources. CSA made this request in response to industry feedback it received during its recent NI 43-101 consultation process. The CIM Reserve Definitions Committee (the Committee) has reviewed the request to provide additional guidance on the "reasonable prospects for economic extraction" clause in the CIM Definition Standards and has reported on our finding below. The two relevant paragraphs of the December 11, 2005 CIM Definition Standards have been included below for reference.

"A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge."

"The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of technical, economic, legal, environmental, socio-economic and governmental factors. The phrase 'reasonable prospects for economic extraction' implies a judgment by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. A Mineral Resource is an inventory of mineralization that under realistically assumed and justifiable technical and economic conditions might become economically extractable. These assumptions must be presented explicitly in both public and technical reports."

The above guidance indicates that when assessing 'reasonable prospects for economic extraction':

- It is the responsibility of the Qualified Person
- It requires judgment based on the Qualified Person's experience
- The methods used and assumptions made to determine if the project has "reasonable prospects" must be presented explicitly in both public and technical reports.

Additional Guidance is provided in the CIM Best Practice Guidelines for the Estimation of Mineral Resources and Mineral Reserves under Section 4, Geological Interpretation and Modeling, Mining and Economic Requirements and Section 5, Mineral Resource Estimation. This guidance indicates that, when considering 'reasonable prospects for economic extraction':

https://mrmr.cim.org/media/1034/additional-guidance-reasonable-prospects-for-economic-extraction.pdf

- An opinion regarding the RPEEE requirements for open pit scenarios was provided by Gosson and Smith (2007).
- Guidance regarding the RPEEE requirements for open pit scenarios was provided by CSA-CIM (2009).
- A complete listing of supporting documents is available from the MRMR Library on the CIM website at: https://mrmr.cim.org/en/library/index-of-documents/#!
- Additional guidance is provided in Chapter 6.12.2 of the MRMR Best Practices Guidelines (2019).

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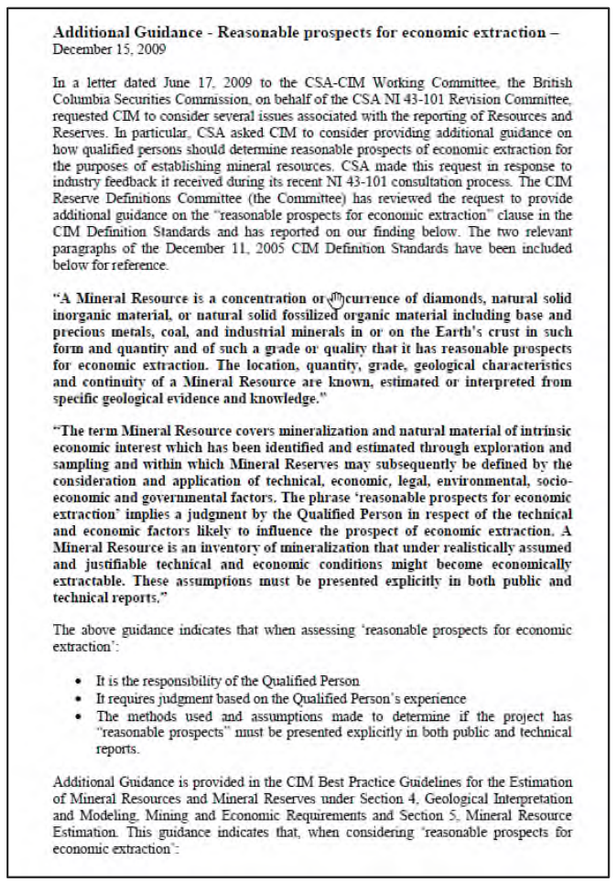

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- The 2007 document discusses a number of factors in relation to the RPEEE requirement including:
- Spatial distribution,
- Cut-off grade, and
- The use of a reporting surface.
- The 2009 document focussed mostly on the use of a surface as a reporting criteria.

RPEEE – Open Pit Constraining Surfaces (2009)

- The 2009 CIM-CSA document provides the following guidance in respect of the use of a constraining surface for reporting Mineral Resources in open pit settings:
- *"The Committee considers that the use of mine planning tools, such as open pit design algorithms, to limit the extent of mineralization is valid for advanced Mineral Resource statements and Mineral Reserves but it may not be appropriate or required, for earlier stage Mineral Resource statements. For early stage assessments the QP may choose to demonstrate "reasonable prospects for economic extraction" by comparing the deposit's attributes to analogous mine operations."*

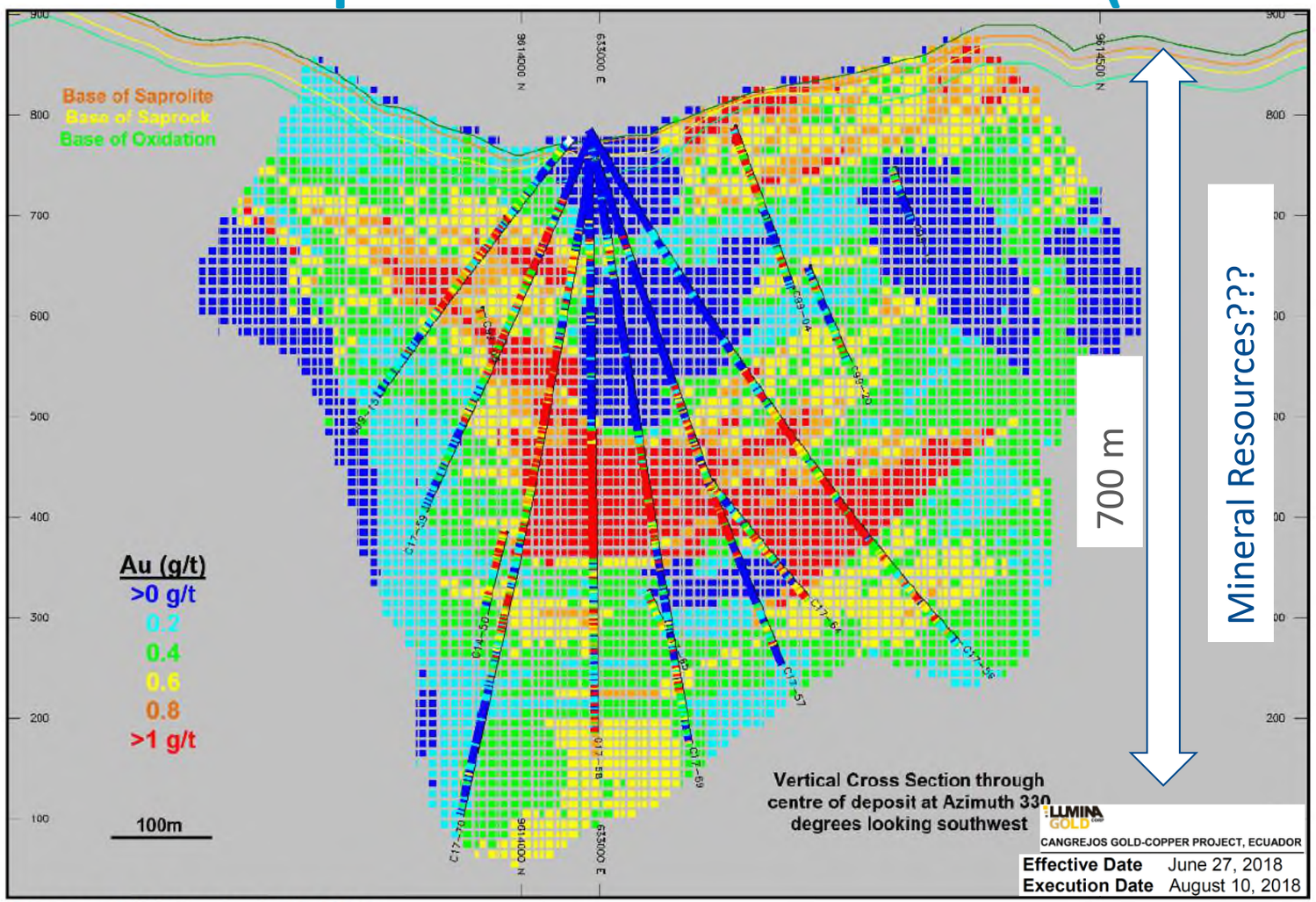
- The document reflected the general industry views of the time.

RPEEE – Open Pit Constraining Surfaces (2019)

- Chapter 6.12.2 of the MRMR Best Practices Guidelines (2019) provides the following guidance in respect of the use of a constraining surface for reporting Mineral Resources in open pit settings:
- *"For Mineral Resources that are amenable to open pit mining methods, the RPEEE should consider not only an economic limit (such as the cut-off grade or value), but technical requirements as well (such as the wall slope angles). At a minimum, the constraints can be addressed by creation of constraining surfaces (pit shells) using either commercial software packages or manual methods. The constraining surfaces can then be used in conjunction with other criteria for the preparation of Mineral Resource statements."*

- The 2019 guidance reflects the currently accepted views regarding the use of constraining pit shells.

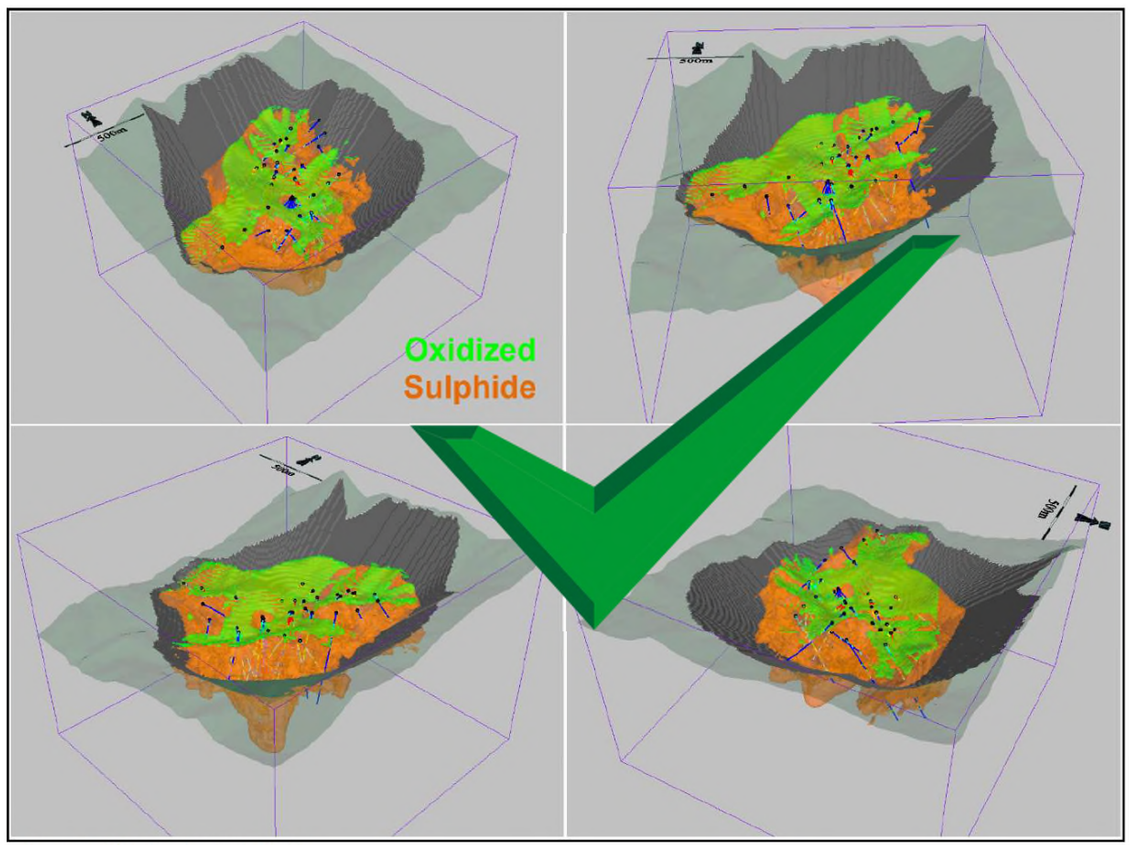
RPEEE–Open Pit Mineral Resources (Current Good Practice)



Source: SIM Geological, 2017

- Example of a Mineral Resource block model prepared using an open pit conceptual operating scenario.
- The drilling information outlines mineralization extending from surface to depths of approximately 700 m.
- The conceptual operational scenario envisions the extraction of the material by means of open pit mining methods.
- The question then becomes: "What portion of the modelled mineralization can reasonably be expected to be extractable under this envisioned operational scenario?"

RPEEE–Open Pit Mineral Resources (Current Good Practice)



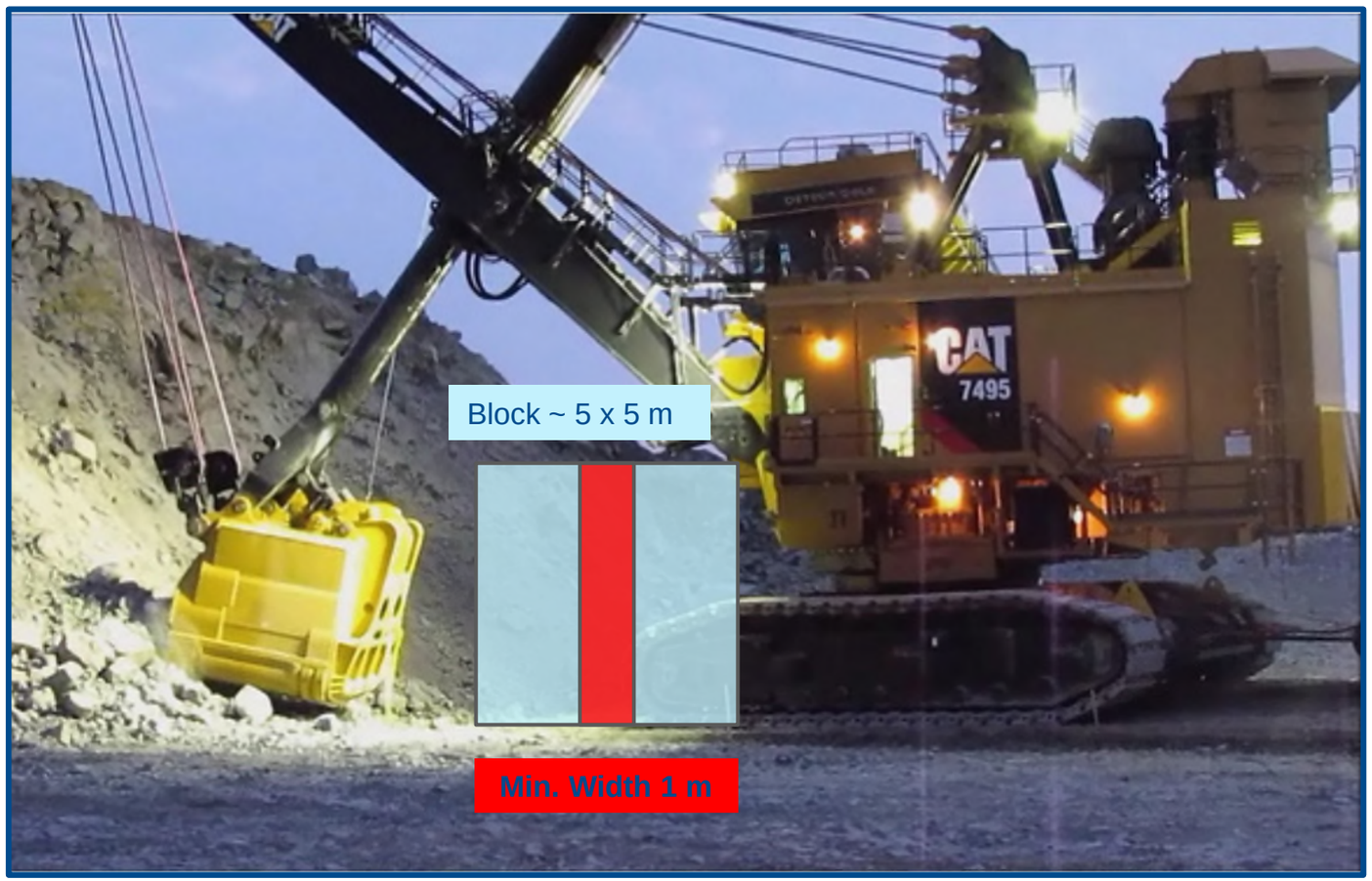
Source: Sim Geological, 2018

- Open pit Mineral Resources are often reported considering a cut-off grade (or value), and with use of a constraining surface.
- Other criteria can be considered, as applicable.
- The use of these criteria are intended to demonstrate the **technical** and **economic** requirements of the "Reasonable Prospects" test for the declaration of a Mineral Resource (for an open pit scenario).
- The application of a constraining surface **DOES NOT** represent an attempt to estimate Mineral Reserves, nor to carry out an economic evaluation.

RPEEE – Cut-Off Grade (Open Pit Mining Method)

- Development of a cut-off grade for reporting of Mineral Resources requires consideration of such elements as:
  - Metal prices,
  - Exchange rates,
  - Operating costs (including mining, processing, general & administration, marketing, etc.),
  - Metallurgical recoveries, and
  - Royalties (as applicable).
- Taken together as expressed in the cut-off grade (or value), the economic requirement of the RPEEE definition is met.
- The level of knowledge of each of these elements will be a function of which stage the Mineral Resource estimate is prepared for (e.g. early discovery vs production).

RPEEE – Minimum Widths



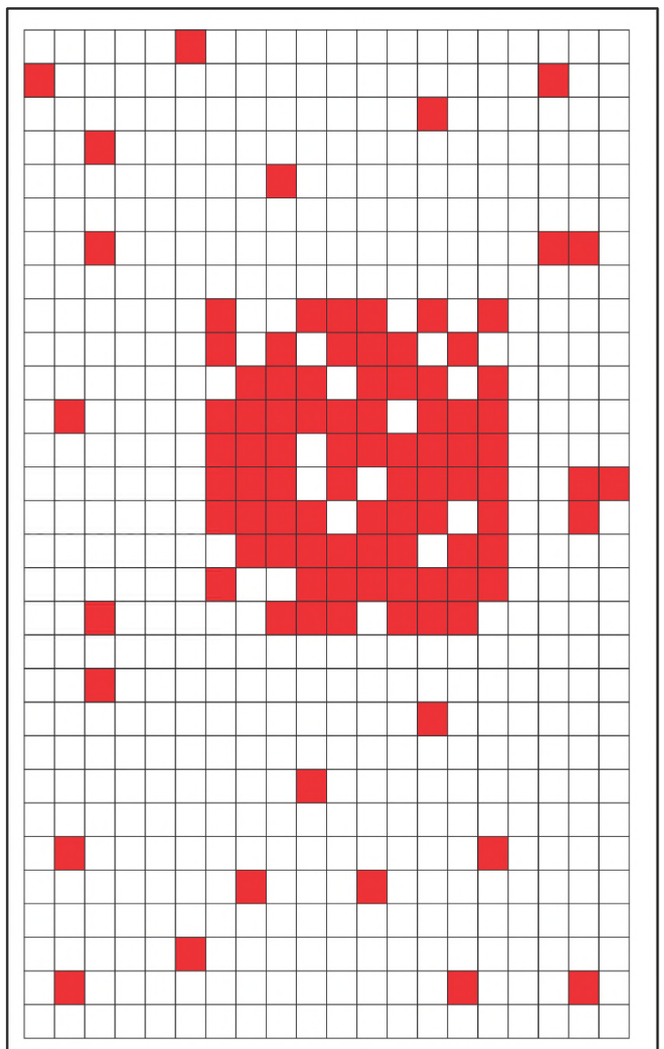
- Consideration of the minimum widths potentially achievable under the envisioned operational scenario is also highly recommended.

RPEEE – Minimum Widths

Photo courtesy of Mandalay Resources.

- Excavation of narrow width mineralization in open pits is possible.
- However the physical limitations of the loading units will dictate the degree of selectivity that is possible.
- The presence of visible signs of the mineralization is also a key consideration.
- Practitioners are encouraged to consult with colleagues for assistance in estimating the sizes of the “Selective Mining Units (SMU’s).

RPEEE – Spatial Continuity



- Consideration of the spatial continuity of the mineralization is also highly recommended when preparing Mineral Resource statements for open pit scenarios.
- Practitioners should carefully consider and understand whether the mineralization can be potentially excavated at the envisioned SMU.
- Additional criteria may be required.

RPEEE – Underground (Cut-off Grade)

RPEEE Considerations – Underground Scenarios

- Consideration of technical and economic criteria are also required when preparing Mineral Resource statements for underground mining scenarios.
- Some more common considerations include:
  - Selection of an appropriate cut-off grade (or value),
  - Consideration of the selectivity of the candidate mining method:
    - Minimum width
    - Spatial continuity

RPEEE Considerations (UG) – Cut-Off Grade

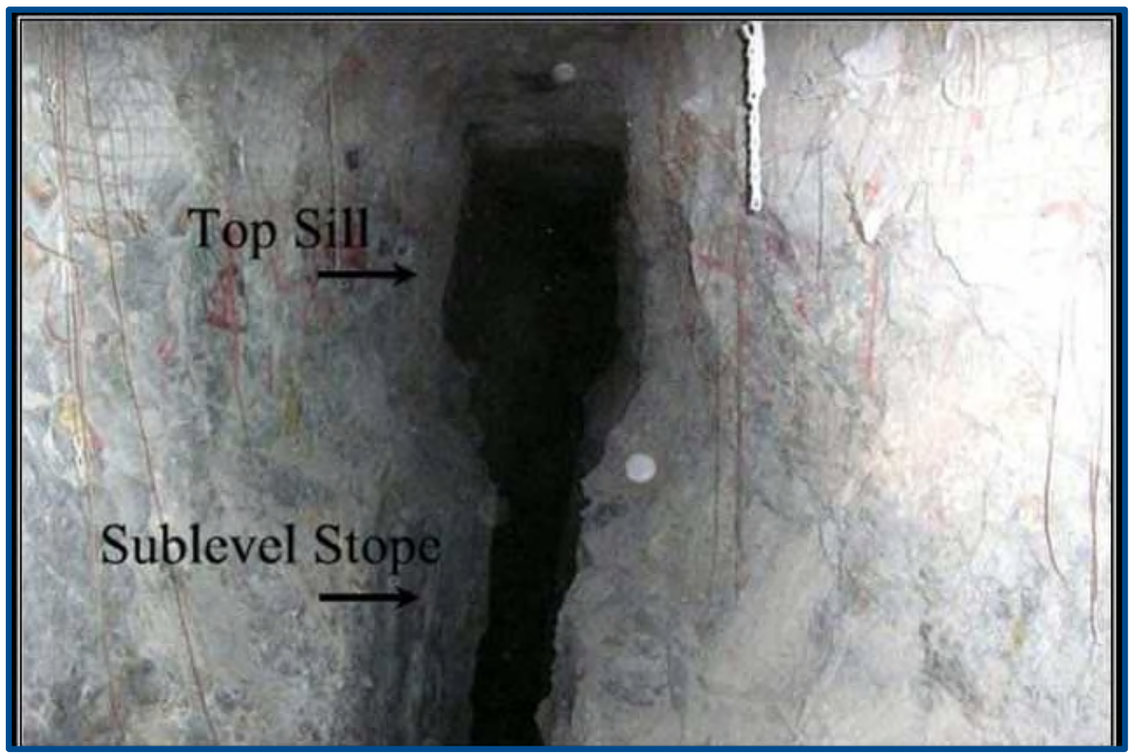
- The selection of an appropriate cut-off grade for underground mining operations has long been the topic of discussion.
- Many approaches and solutions have been developed and successfully implemented over time.
- Additional guidance regarding cut-off grades has been provided in Chapter 7.2 of the CIM MRMR Best Practices Guidelines (2019) and the references therein.

RPEEE – Cut-Off Grade (UG Mining Methods)

- As with open pits, development of a cut-off grade for reporting of Mineral Resources requires consideration of such elements as:
  - Metal prices,
  - Exchange rates,
  - Operating costs (including mining, processing, general & administration, marketing, etc.),
  - Metallurgical recoveries, and
  - Royalties (as applicable).
- Taken together as expressed in the cut-off grade (or value), the economic requirement of the RPEEE definition is met.
- The level of knowledge of each of these elements will be a function of which stage the Mineral Resource estimate is prepared for (e.g. early discovery vs production).
- However the envisioned mining method must now be considered, as the mining costs can vary widely for various mining methods. This can have a large impact on the selection of an appropriate cut-off grade (or value) and RPEEE.

RPEEE – Underground (Minimum Widths)

RPEEE – Minimum Widths



- The concept of minimum widths is not new. It has been a fundamental consideration for underground mining for many years.
- The minimum widths can vary between level development and the actual stope.

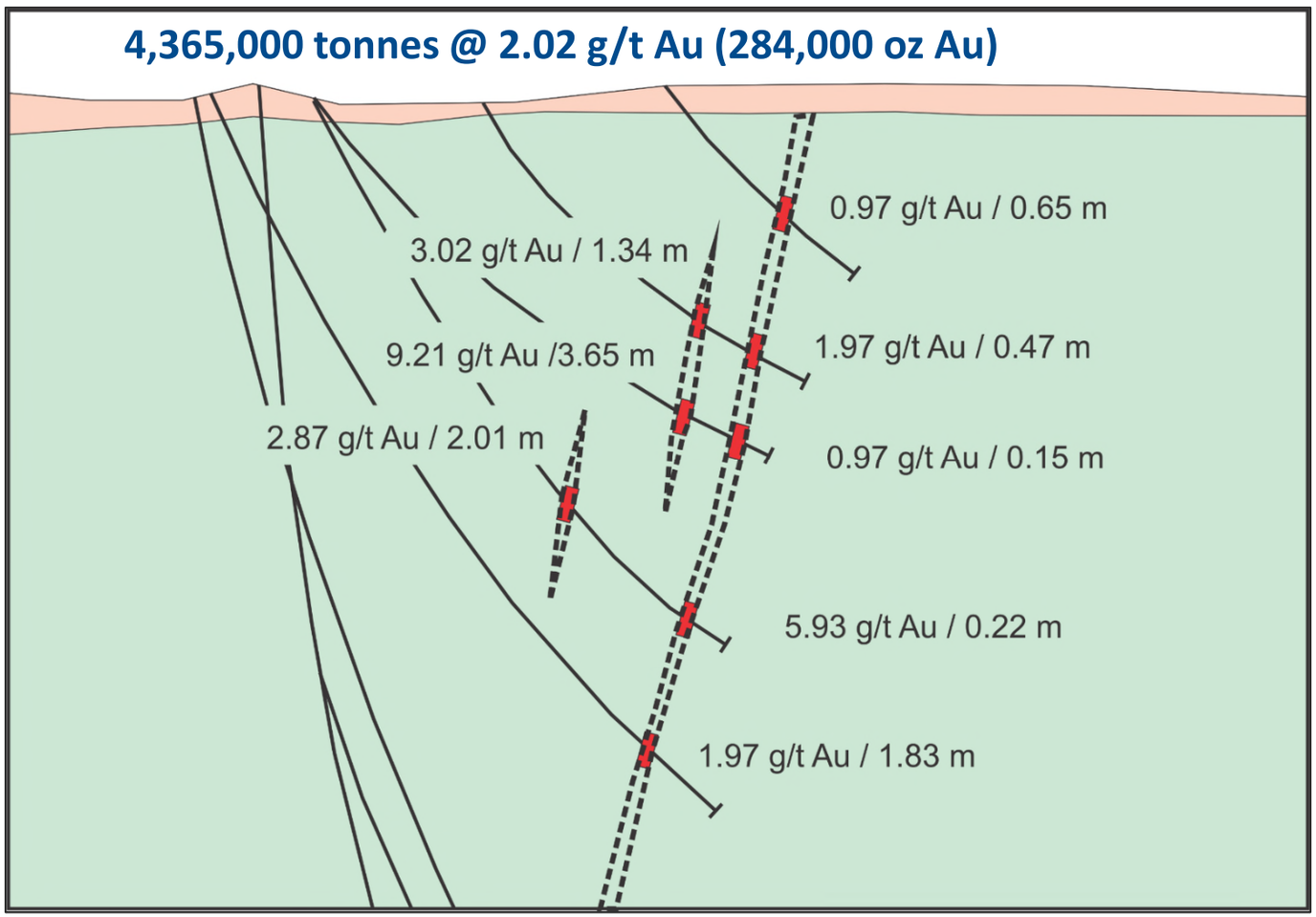
RPEEE – Minimum Widths

- The physical sizes of the mining equipment are key considerations for selection of an appropriate minimum width for steeply dipping deposits.

RPEEE – Minimum Widths

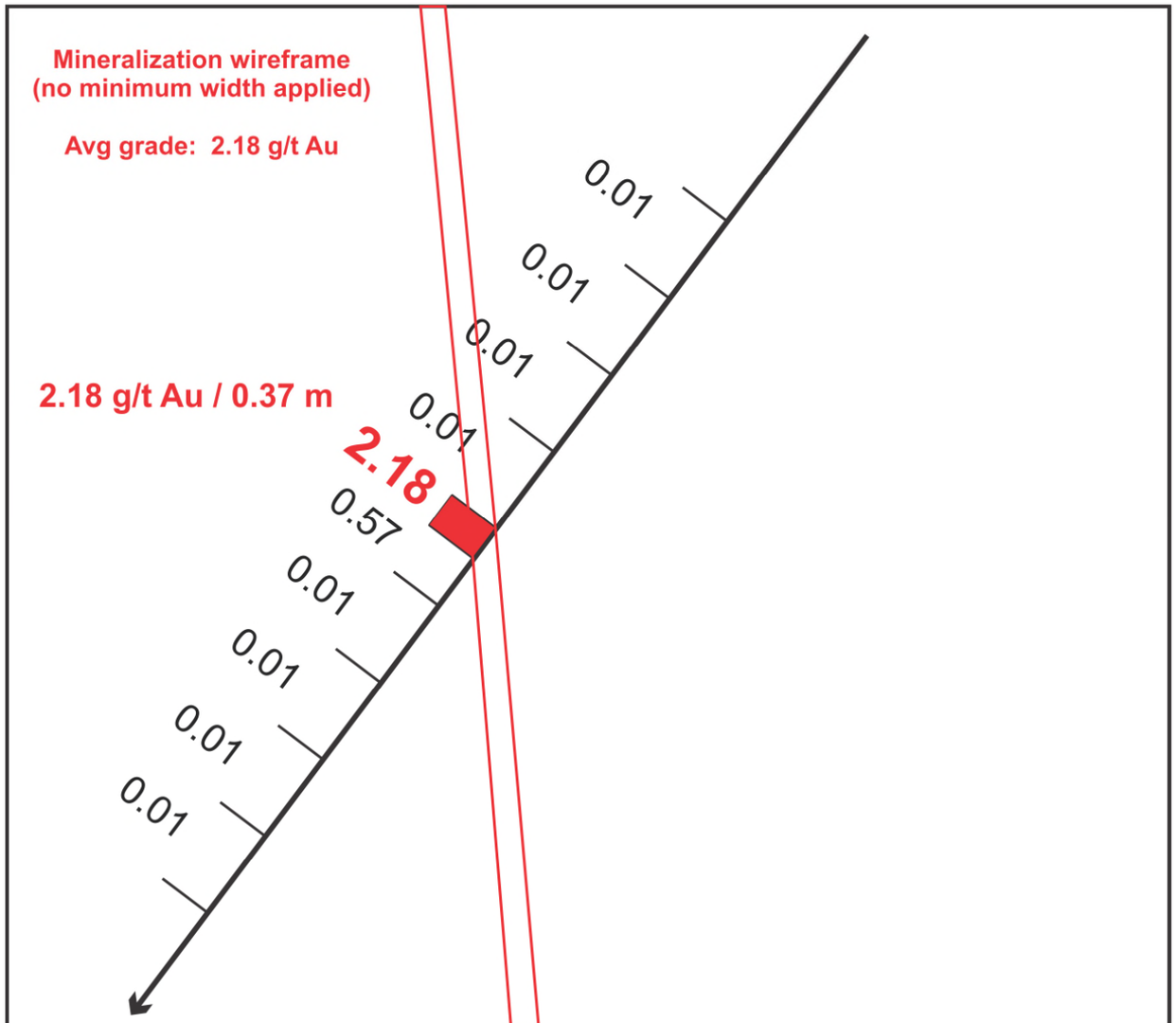
- The concept of minimum widths is not restricted to steeply dipping deposits.
- It applies to flat-lying deposits too.

RPEEE – Minimum Widths



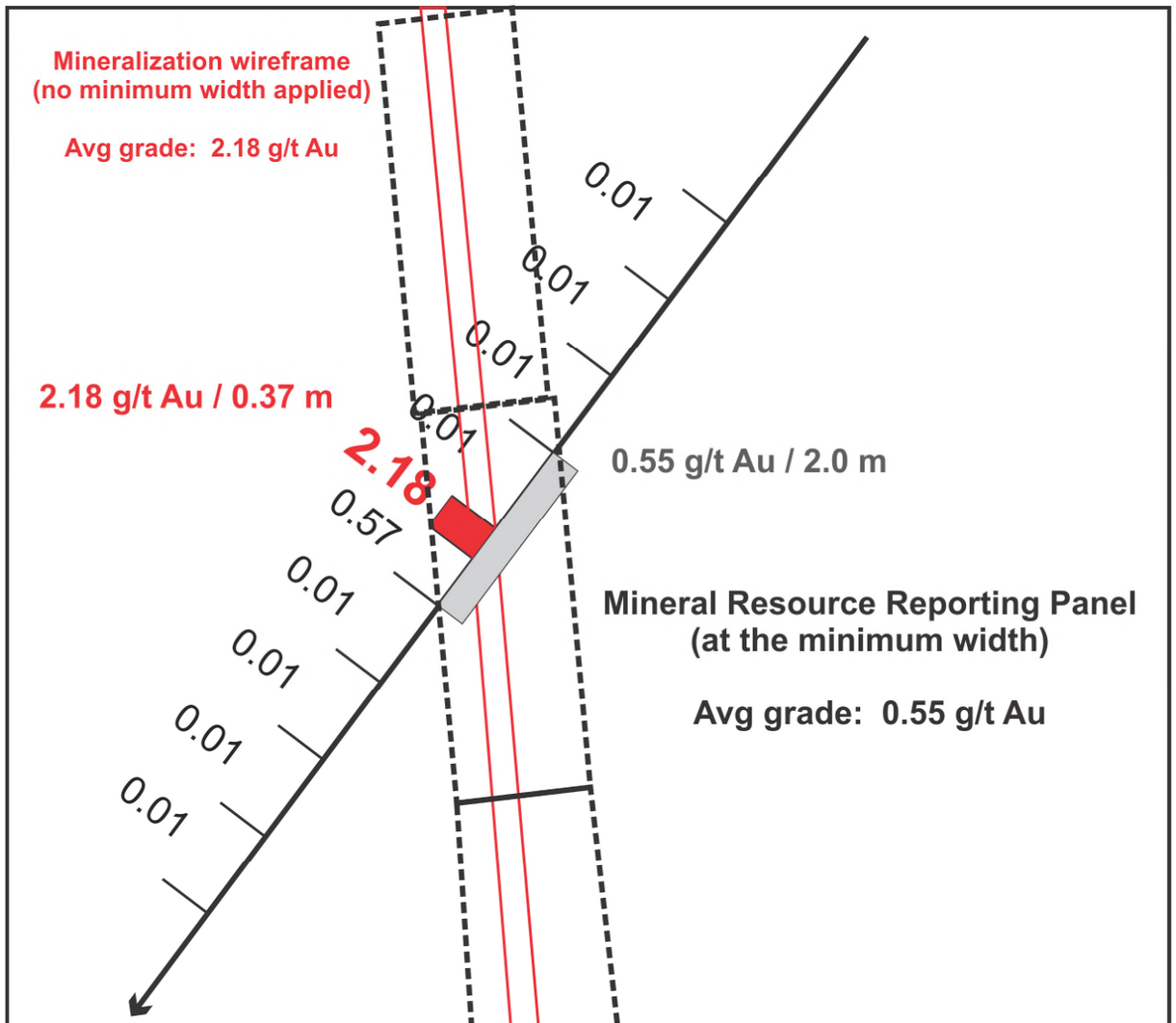
- In some cases, Mineral Resource statements have been prepared without consideration of minimum widths (and with limited continuity).
- Can these statements be considered as representative of the potential tonnages and grades that can be excavated using the envisioned underground mining method?
- A common bias of this approach is to under-estimate the tonnages and over-estimate the grades.

RPEEE – Minimum Width Solutions



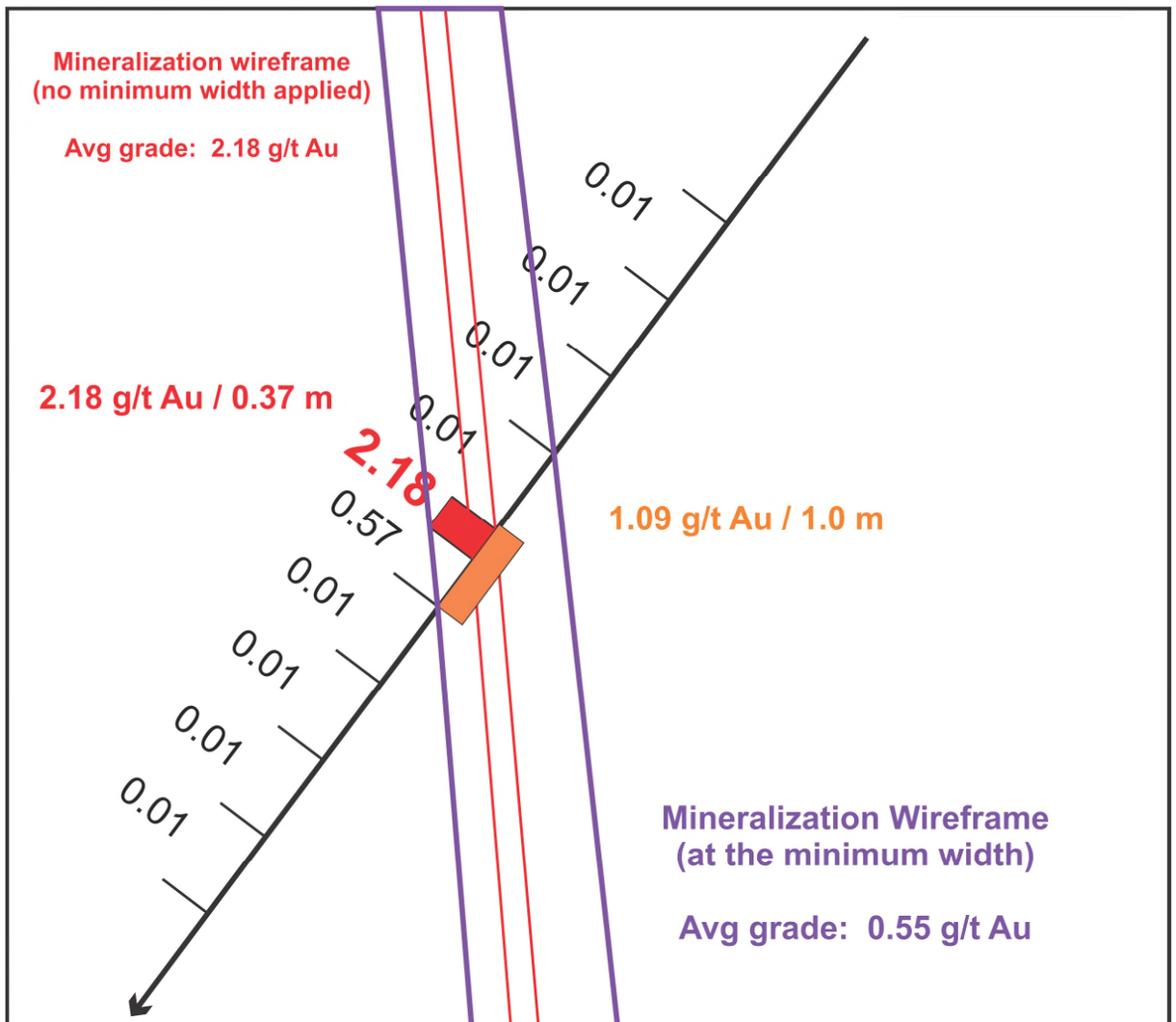
- In some cases, Mineral Resource models are prepared using mineralization wireframes that are drawn without consideration of the minimum mining widths of the contemplated underground mining method.
- While the selection of the estimation workflows resides with the Qualified Person, care should be taken to avoid preparing Mineral Resource statements in these situations.
- In many cases, the tonnage and grade statements from these workflows are mis-understood by the target audience.

RPEEE – Minimum Width Solutions



- Solutions currently in use include the use of Mineral Resource reporting panels that address the minimum width requirement for a Mineral Resource statement.
- An additional solution is to use a minimum grade times thickness (“G x T” or “metal factor”) product as a reporting criteria.
- Experience has shown that care and careful examination are required when using the “G x T” approach.

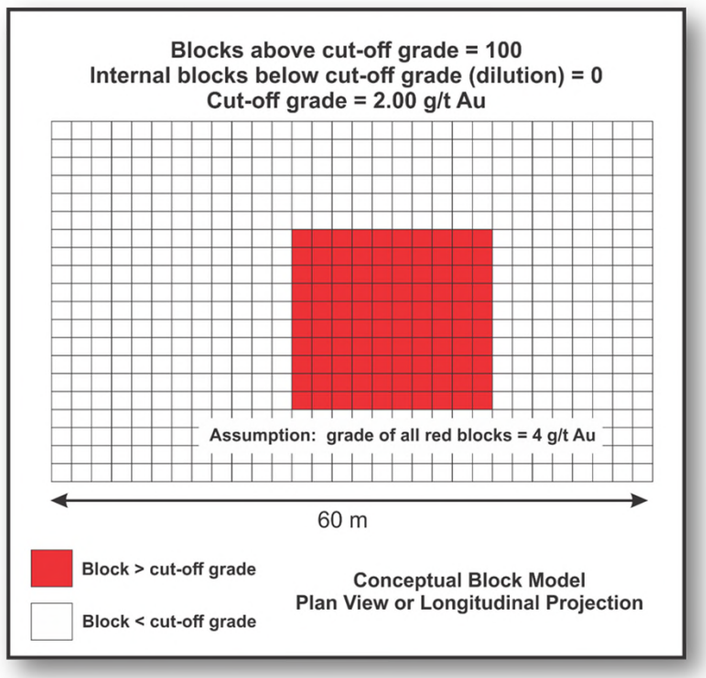
RPEEE – Minimum Width Solutions



- Extra expenses are required to purchase the software packages to produce the Mineral Resource reporting panels. Additional time is also required.
- In our experience, the creation of a Mineral Resource wireframe using the minimum width criteria at the early stages is more time and cost efficient.
- We recommend "snapping" the wireframes to the sample intervals, as the distribution of the mineralization within any given sample is not homogenous.
- The assay value for a sample is the **average grade** of the materials within the sampled interval.

RPEEE – Underground
(Spatial Continuity – the “Checkerboard Effect”)

CIM Journal Article – Checkerboard Effect



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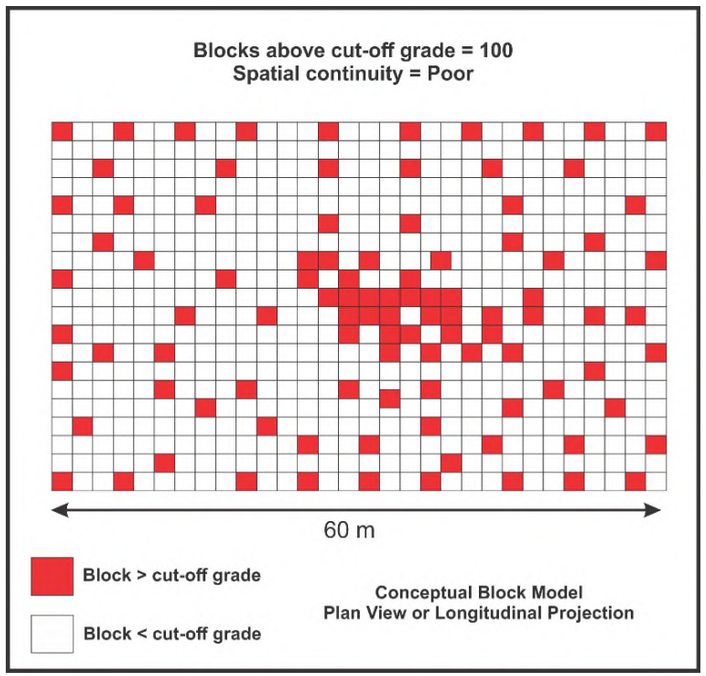

A common approach in the digital age is to report all blocks above a cut-off grade (i.e. using a “block cut-off”).

This approach can have unintended results as the spatial continuity of the above cut-off grade blocks are not considered. The spatial continuity of any internal dilution blocks are not considered either.

We refer to this condition as “The Checkerboard Effect”.

CIM Journal Article – Checkerboard Effect

The checkerboard effect and mineral resource reporting of underground mineral resources

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https://doi.org/10.1080/19236026.2021.1902203

ABSTRACT The goal of a Mineral Resource statement is to estimate the in-situ tonnage and grade that might reasonably be expected to be extracted using the contemplated mining methods. Despite the transition by the mining industry to the use of computer-aided methods for preparing Mineral Resource estimates, the fundamental realities of complying with the CIM Definition Standards requirement of "Reasonable Prospects for Eventual Economic Extraction" (RPEEE) have not changed. Computer-aided block modeling can result in an irregular, patchwork of blocks above and below cutoff grade, termed the checkerboard effect. In such cases, for underground mining methods, strict application of a block cutoff grade does not consider the impact of any internal dilution blocks that may be present, while also potentially including blocks above cutoff grade that may not have sufficient spatial continuity. Considering the block dimensions relative to the selectivity of the potential underground mining method, this can result in material errors in Mineral Resource statements. The impact of the checkerboard effect varies from deposit to deposit. While several techniques are currently employed by Mineral Resource practitioners to ensure compliance with the RPEEE requirement of a Mineral Resource, practitioners are encouraged to develop additional methods and techniques that provide reasonable results.

KEYWORDS Block model, Checkerboard effect, Constraining surfaces, Constraining volumes, Internal dilution, Mineral resources, Reasonable prospects, Underground mining method

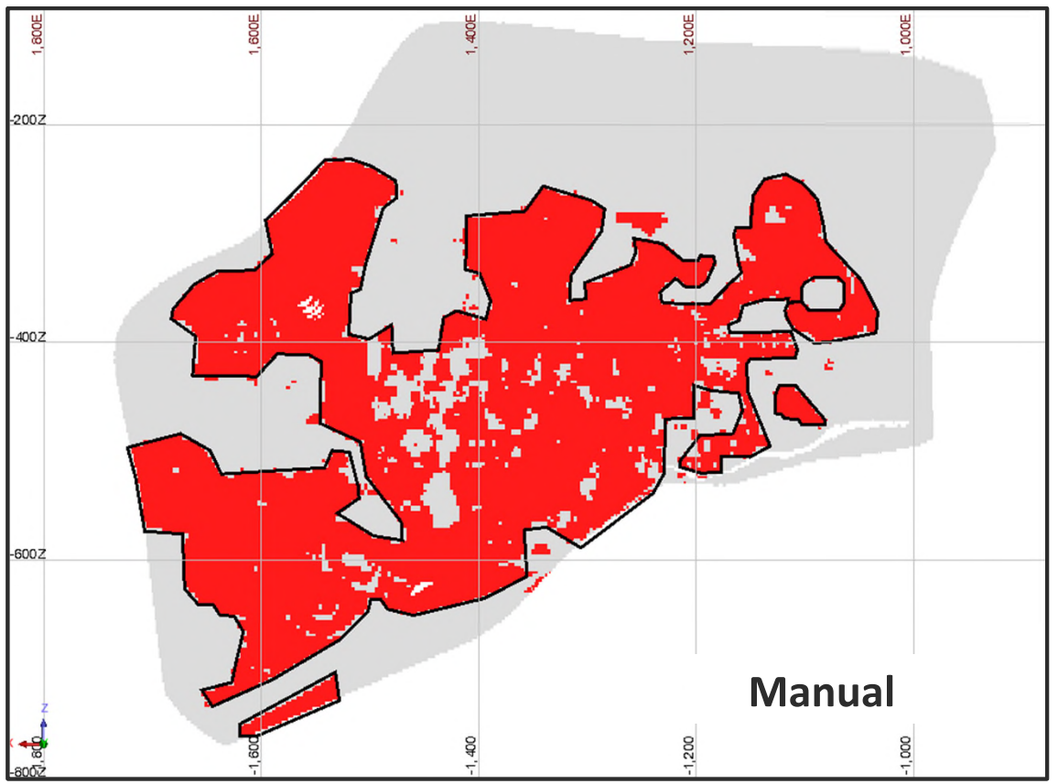
RÉSUMÉ Le but d'un énoncé des ressources minérales consiste à estimer le tonnage et la teneur in situ qui pourraient raisonnablement être extraits à l'aide des méthodes d'extraction envisagées. Malgré la transition de l'industrie minière vers l'utilisation de méthodes assistées par ordinateur pour la préparation des estimations des ressources minérales, les réalités fondamentales du respect de l'exigence des normes de définition de l'ICM concernant les perspectives raisonnables d'extraction économique éventuelle (RPEEE, de l'anglais *Reasonable Prospects for Eventual Economic Extraction*) n'ont pas changé. La modélisation de blocs assistée par ordinateur peut donner lieu à un patchwork irrégulier de blocs au-dessus et en dessous du seuil de teneur limite appelé effet de damier. Dans de tels cas, pour les méthodes d'exploitation souterraine, l'application stricte d'une teneur limite de bloc ne tient pas compte de l'impact des blocs de dilution interne qui peuvent être présents, tout en incluant potentiellement des blocs au-dessus de la teneur limite qui peuvent ne pas avoir une continuité spatiale suffisante. Compte tenu des dimensions des blocs par rapport à la sélectivité de la méthode d'extraction souterraine potentielle, cela peut entraîner des erreurs importantes dans les énoncés des ressources minérales. L'impact de l'effet damier varie d'un dépôt à l'autre. Bien que plusieurs techniques soient actuellement utilisées par les praticiens des ressources minérales pour assurer la conformité à l'exigence de la RPEEE d'une ressource minérale, les praticiens sont encouragés à élaborer d'autres méthodes et techniques qui fournissent des résultats raisonnables.

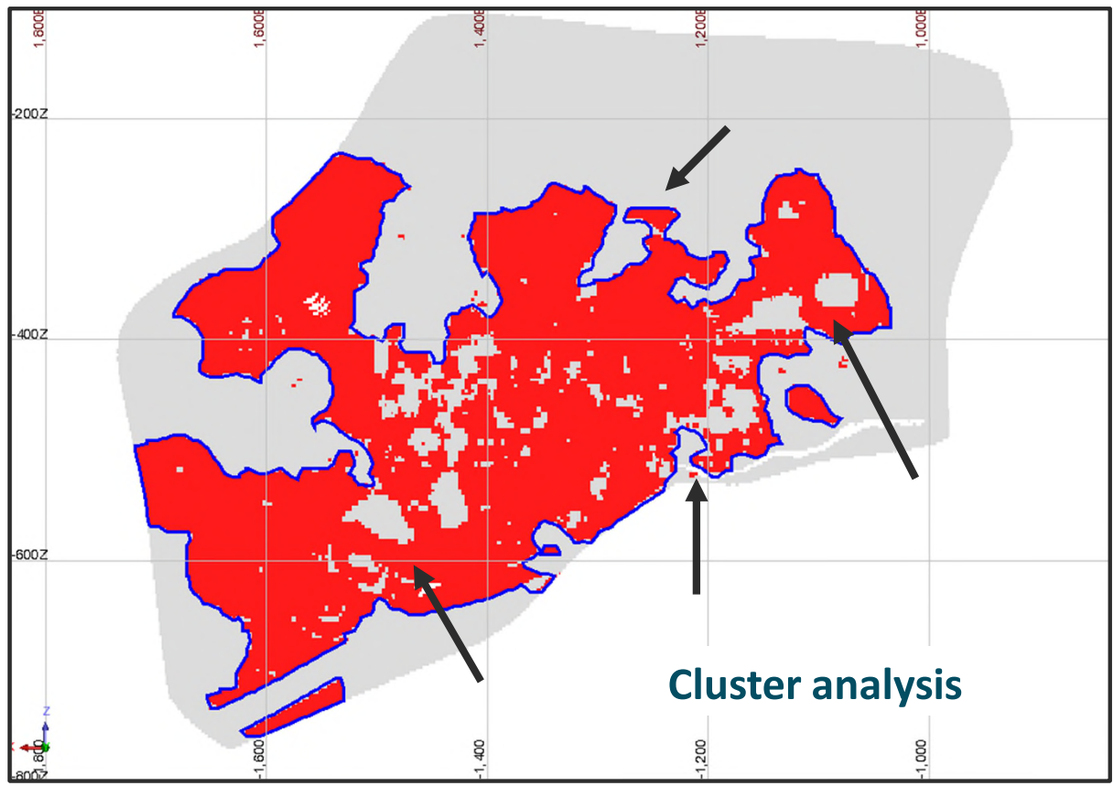
MOTS-CLÉS dilution interne, effet de damier, méthode d'extraction souterraine, modèle de bloc, perspectives raisonnables, ressources minérales, surfaces de contrainte, volumes de contrainte

- A discussion on sources of "The Checkerboard Effect" and suggested solutions can be found in an article published in the CIM Journal, Volume 12, Issue 2 (April, 2021).
- Copies of the article are available to CIM members at:

  www.cim.org/library/cim-journal/

Solutions – Clipping Polygons

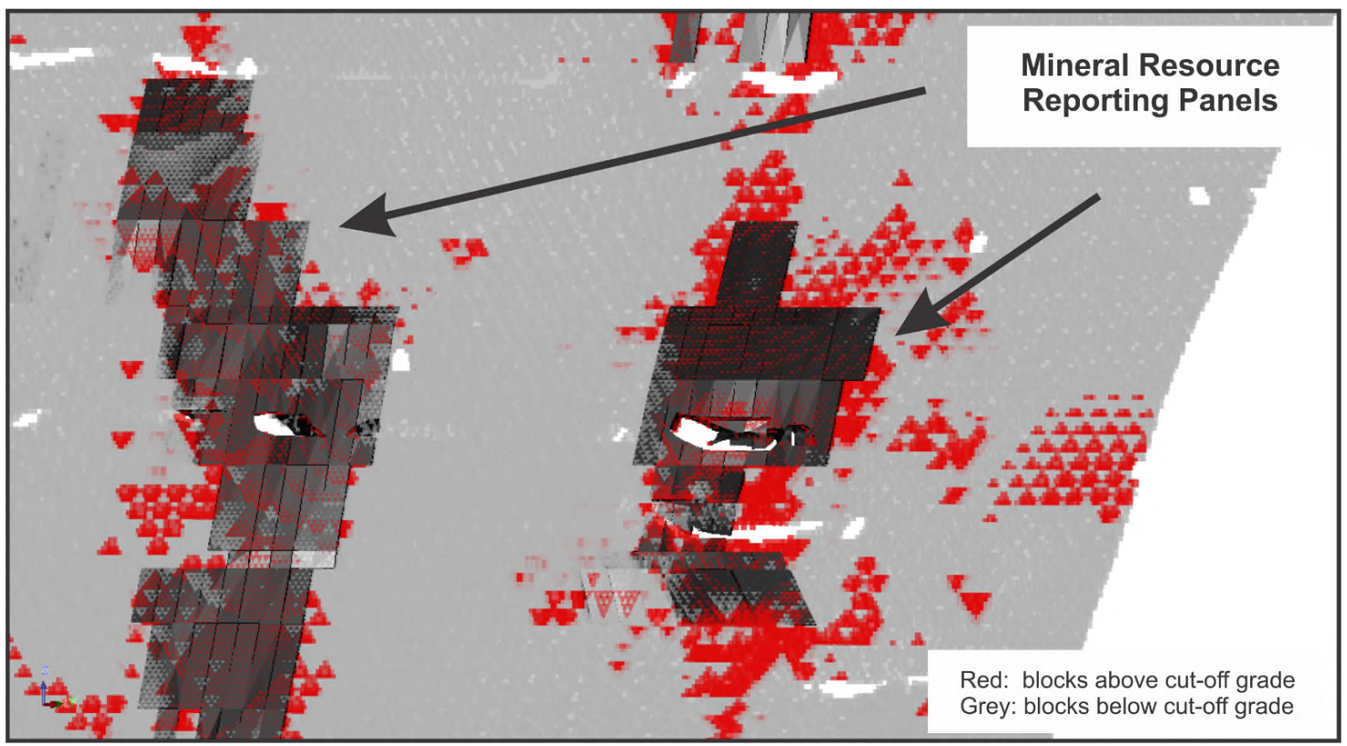




Manual methods clipping polygons are effective for dealing with a small number of cases, say less than 20.

Alternative methods are required to deal with larger number of cases. Machine learning can be used to automate the process.

Solutions – Report blocks inside reporting panels

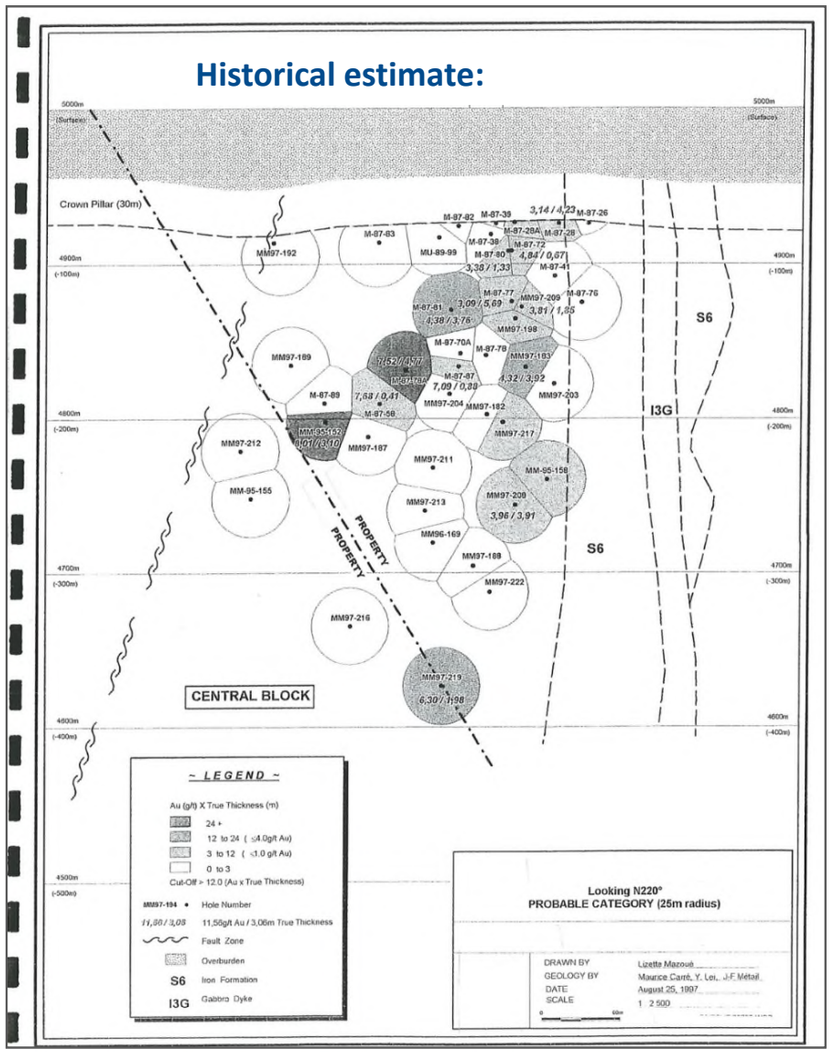


A common solution in use is the creation of reporting volumes generated by computer software programs.

The parameters selected as inputs for creation of these panels can be chosen to comply with the RPEEE requirement of the CIM Definition Standards for Mineral Resources.

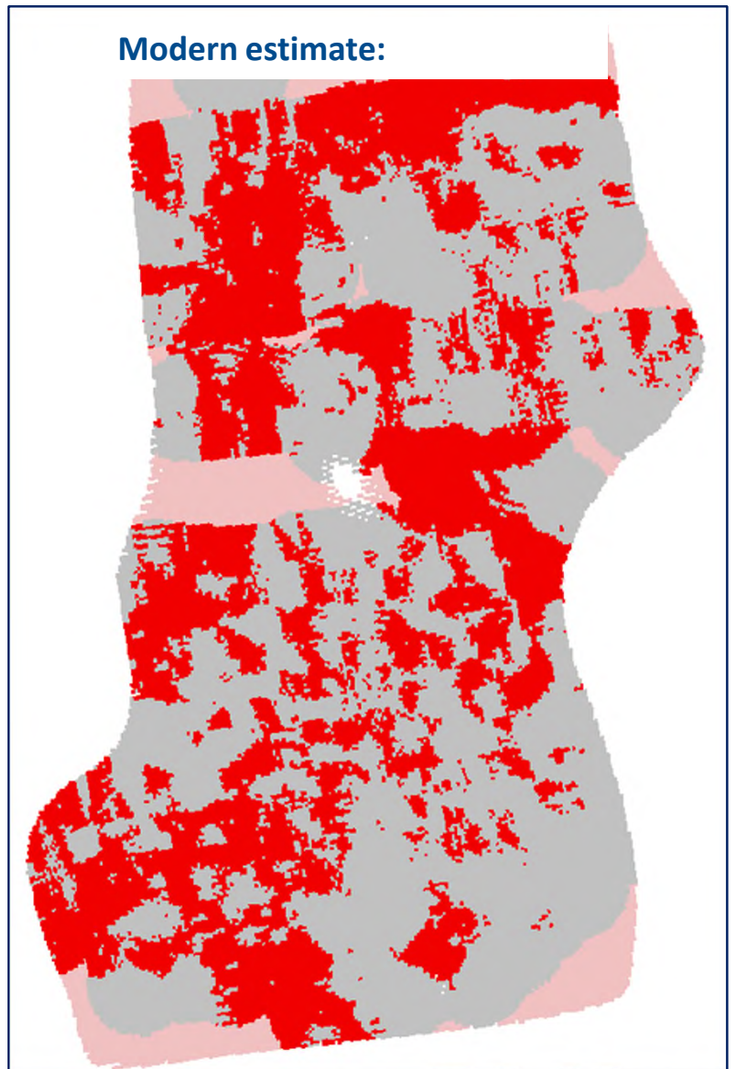
The Mineral Resource statement would then be a summation of all of the block tonnes and grade contained within the reporting panels.

Spatial Continuity - A Very Old Conversation



Historical methods or modern methods - it's the same old discussion!

The only new item is the use of computers in preparing Mineral Resource statements.



WRAPPING UP

Conclusions

- The RPEEE requirement of the CIM Definition Standards has long been one of the key underlying fundamental concepts for Mineral Resource statements.
- Considerations for RPEEE include demonstration of the technical and economic potential of the conceptual operational scenario using reasonably-derived parameters.
- Mineral Resources are estimated for a variety of situations over time. The level of knowledge, understanding, and the level of confidence/accuracy of the input parameters will vary for each stage and changing market conditions.
- The economic potential requirement is often demonstrated by selection of an appropriate cut-off grade (or value). A time-honoured concept that remains unchanged.
- The technical potential is often demonstrated by consideration of the mining selectivity and spatial continuity of the mineralization relative to the conceptual operational scenario. Again, a time-honoured concept, but adapted for today's digital age.

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