2015 CIM Guidance on Commodity Pricing used in Resource and Reserve Estimation and Reporting submitted by the Commodity Price Sub-Committee of the CIM Best Practices Committee adopted by CIM Council November 28, 2015

Background

The original version of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Commodity Price Guidance was dated April 14, 2008 and updated November 30, 2009. Subsequently additional guidance was provided in the following documents:

- CIM guidelines on the "reasonable prospects" clause, published December 15, 2009;
- Best Practice Guidelines for Mineral Processors which includes extensive summaries of the contents for various types of technical reports dated April 1, 2011;
- CIM Standards and Definitions for Mineral Resources and Mineral Reserves approved by Council on May 30, 2014, and;
- Additional guidance on the "Reasonable Prospects of Eventual Economic Extraction" clause prepared by the CIM Best Practices Committee and issued November 20, 2014.

In addition, the Canadian Securities Administrators (CSA) updated National Instrument 43-101 (NI 43-101) with the effective date of June 30, 2011. The Qualified Person (QP) should also review the CIM Best Practice Guidelines for the Estimation of Mineral Resources and Reserves dated November 23, 2003.

In early 2015 the CSA requested that CIM update the November 30, 2009 guidance document. This CIM 2015 guidance document incorporates information included in the above documents prepared by the CIM and current industry practice. In this document grade and quality and tonnage and quantity or volume are used interchangeably.

Introduction

The November 30, 2009 CIM Guidance document summarizes questions raised by the CSA and the responses to those questions by the CIM Reserve Definition and the CIM Estimation Best Practices Committees. This information was intended to provide the QP with further guidance when estimating Mineral Resources and Mineral Reserves and in preparing a supporting NI 43-101 Technical Report. As requested by the CSA, CIM formed a new sub-committee in March 2015 (Commodity Price Sub-committee) to update the November 30, 2009 document.

The structure of the November 30, 2009 guidance document has been maintained however it has been edited and updated. The issues discussed in this document refer to the original questions raised by CSA and discussed in the April 14, 2008 and November 30, 2009 documents and are underlined in the text below.

As noted above, CIM provided guidance in regard to the "reasonable prospects" clause in December 15, 2009 and additional guidance on "eventual economic extraction" on

November 20, 2014. The key points included in the November 20, 2014 document are included below where necessary.

The phrase 'reasonable prospects for eventual 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. The Qualified Person should consider and clearly state the basis for determining that the material has reasonable prospects for eventual economic extraction. Assumptions should include estimates of cut-off grade and geological continuity at the selected cut-off, metallurgical recovery, smelter payments, commodity price or product value, mining and processing method and mining, processing and general and administrative costs. The Qualified Person should state if the assessment is based on any direct evidence and testing.

Interpretation of the word 'eventual' in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron, potash deposits and other bulk minerals or commodities, it may be reasonable to envisage 'eventual economic extraction' as covering time periods in excess of 50 years. However, for many gold deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to much shorter periods of time.

Interpretation and judgement of the word "eventual" is the responsibility of the QP.

Issue 1. – <u>The CSA requested CIM review and comment on the selection of an appropriate commodity price to be used in Mineral Resources and Mineral Reserves estimates.</u>

Commodity prices are one of the most significant parameters used in the estimation of Mineral Resources and Mineral Reserves and in the economic analysis of a mineral property. In times of rapidly changing commodity prices, or when prices are at the extreme ends of a commodity price cycle, the QP may have difficulty in selecting an appropriate commodity price that is reasonable and acceptable to his or her peers.

The selection of appropriate technical variables, including commodity price, is the responsibility of the QP. The QP must describe the reasons for selecting these variables, including price, in the supporting "Technical Report".

The definition of a "Mineral Resource" contains the wording "reasonable prospects for eventual economic extraction". The word "eventual" was added in May 30, 2014 to the CIM Definition Standards and discussed in additional guidance provided by CIM in the November 20, 2014 document. Therefore, a QP must select economic parameters, including commodity prices, that are used for an estimate of Mineral Resources and Mineral Reserves that have "reasonable prospects for eventual economic extraction".

CIM understands that what might be considered reasonable in one case may not be reasonable in another. For example, prices used may be influenced by the timeframe for placing a property into production. If a property is not likely to be placed into production for five years, then it may be reasonable for the QP to consider a "long term" commodity

price or average commodity price, whereas if a property is in production or is to be placed into production in the short term it may be reasonable to consider the use of prices closer to the current price initially and then consider changing to the longer term price in a few years.

Exchange rates, like commodity prices, tend to be cyclical and in the case of the US dollar, the currency in which most commodities are traded can be counter-cyclical to commodity prices. If the QP determines that long term average commodity prices are to be used, then consideration should also be given to the use of long term average exchange rates.

The following is a summary of several methods that a QP may use when selecting a commodity price. These are not expressed in order of preference but are listed to provide the QP with some guidance as to the selection of appropriate prices. It is important that the QP base the selected metal price on the method that is most appropriate and supportable for the particular mineral project.

- Long term historical averages
  The use of long term historical prices (5 years or longer) has the advantage that it should remove the annual price volatility from a company's Mineral Resource and Mineral Reserve estimates and reporting but it has the disadvantage that it can lead to material difference in asset value when benchmarked against current price. This method is appropriate for many industrial minerals and commodities with low price volatility. For commodities with high price volatility long term average prices may not reflect underlying trends and other methods may be more appropriate.

  The prices comprising the historical average may or may not be inflation-adjusted (i.e., expressed in constant dollars) – in either case, the QP should disclose the details of the methodology and the rationale.

  For shorter time spans, advantages and disadvantages of historical average prices become similar to cases discussed below (three-year moving average and current price).

- Three-year moving average – US Securities and Exchange Commission (SEC) guideline.
  The three year trailing average method uses the moving or trailing average of the commodity prices for the last three years. The use of three year trailing average prices will remove some of the volatility when compared to current prices; however, it has the disadvantage of understating Mineral Resources and Mineral Reserves in a rising market, and overstating Mineral Resources and Mineral Reserves in a falling market. In periods of rapid metal price changes, the differences may be significant.

When considering the "three year moving average" method the QP should consider the following text in italics taken from the "2012 Mining Report" prepared by the British Columbia Securities Commission and dated January 2013 page 15.

3. Metal Pricing Assumptions

a) Metal pricing assumptions

Metal or commodity price assumptions are used to establish cut-off grade and reasonable prospects of economic extraction, and for the financial analyses in PEAs and mining studies. Pricing assumptions can have a significant impact on the size of the mineral resource or mineral reserve and the resulting economic analysis based on these estimates. For this reason, metal or commodity pricing is an area of potential concern to securities regulators.

The Mining Rule (NI 43-101) does not specify how a QP should determine pricing assumptions. Generally, we expect that any assumptions will be explained in the technical report and be consistent with what other QPs and companies are using at the time. When a QP uses prices that are materially different from those other QPs are using, it could raise concerns that the resulting mineral resources, mineral reserves, and economic analyses will not be reasonably comparable to other similar projects and might be misleading to investors.

***Extra Note:** Where a QP uses anomalous metal or commodity pricing assumptions, we may ask the QP to explain the basis for the pricing assumptions and provide examples of other technical reports prepared by credible sources that use similar pricing assumptions. Alternatively, we may ask the QP to revise the original assumptions.*

b) SEC guidance

We understand the US Securities and Exchange Commission (SEC) accepts, as a maximum price allowed, the lesser of the three-year moving average and current spot price. We see many Canadian mining companies using this method and recognize that it has become a common industry standard.

NOTE: The BCSC 2012 Mining Report has added "the lesser of the three-year moving average and current spot price" to the SEC definition.

c) High and low price sensitivity

We recognize that it is common industry practice to show metal price sensitivities in Preliminary Economic Assessments (PEAs) and other economic analyses. While we do not take issue with this approach, we have observed a number of situations where companies are reporting only positive sensitivities.

***Extra Note:** Disclosure of only positive price sensitivity could be misleading to investors, because it does not reflect the risk of lower prices.*

- Consensus Prices

The use of consensus prices obtained by collating the prices used by peers or as provided by industry observers, such as analysts for example, may be used in some cases. This methodology has the advantage of providing prices that are acceptable to a wide body of industry professionals (peers). The disadvantage is that sometimes these predictions can be consistently wrong for reasons beyond the QP's control. These prices are generally acceptable for most common commodities, major industrial minerals, and some minor minerals.

- Contract Pricing

Long term contract prices may be used in some deposits, where appropriate contracts are in place. Again, these prices may be different from the current market prices but would reflect the company's individual Mineral Resource and Mineral Reserve position over the term of the contracts. The disadvantage is that many companies do not wish to have their longer term contract prices disclosed for competitive reasons. This method is difficult to use for industrial minerals without loss of confidentiality.

- Margin over Cash Cost of Production

Some commodity prices have a relationship to cash costs and the world cash cost of a production curve. In periods of higher commodity prices, companies may do more stripping or process more marginal material or stockpiles because they can do it profitably. In periods of sustained higher prices, this can increase the average cash cost of production and in periods of sustained low prices, reduced stripping and the mining of higher grades can reduce the average cash cost of production. The QP may consider adding a margin to the current mid-point on the world cash cost of production curve as a way of determining the commodity price to be used in Mineral Resource and Mineral Reserve estimates. There are a number of services that provide cost data as well as forecasts of commodity prices (AME Mineral Economics, Brook Hunt & Associates Ltd. and the CRU Group, for example). This method is generally good for base metals and precious metals and good for major industrial commodities such as bauxite, phosphate, potash, coal and mineral sands where data are readily available but is not very useful for other industrial minerals.

- Current commodity price.

The use of current commodity prices presents a number of positives and negatives. In terms of positives, the estimate describes the company Mineral Resources and Mineral Reserves on the day of the report and it is a clear, concise and transparent method of determining the price. In terms of negatives, at the peak of the commodity cycle, use of current prices will tend to overstate the long term value of a company's Mineral Resources and Mineral Reserves and at the trough of the commodity cycle, it will tend to understate the long term value of a company's Mineral Resources and Mineral Reserves. Also, using current commodity price method could require significant annual adjustments to a company's Mineral Resource and Mineral Reserve base in periods of high price

volatility. It should be noted that the current commodity price is usually not acceptable for use in reports filed with the SEC in the United States and it is not usually acceptable to Securities Regulators in Canada.

CIM notes that use of other price-determining methodologies may result in prices equal to current prices, which is, of course, acceptable.

- Specialist Consultant Reports

Specialty consultants who prepare commodity price forecasts can be retained to prepare an estimate of the prices that will apply to a particular commodity. This is especially applicable to the case where a commodity has no published reference price to rely on. Some industrial minerals, fertilizers, and certain rare metals would be examples. As an example of a specialist consultant, Ferticon Limited is often used in the potash industry as a source for prices used in for Mineral Resources and Mineral Reserves estimation.

Issue 2. – <u>The CSA reports that many QPs are reporting estimates at multiple cut-off grades (including zero cut-off grades) but are not opining on which estimate should be disclosed in the company's Mineral Resource and Mineral Reserve statements.</u>

QPs are reminded that the CIM Definition Standards and the CIM Best Practice Guidelines refer to one estimate of the Mineral Resources and Mineral Reserves of a deposit and industry practice is also to report one estimate of Mineral Resources or Mineral Reserves for the deposit. The reporting of a table of Mineral Resources or Mineral Reserves and omitting to select one estimate is not reporting a Mineral Resource or Mineral Reserve estimate for the property. In our discussions with the CSA, it has been indicated that they will consider a Technical Report that does not select a specific estimate to be non-compliant with NI 43-101. QPs are further reminded that one of the purposes of a NI 43-101 report is to support disclosure of an estimate of Mineral Resources and Mineral Reserves (see below).

CIM considers it reasonable to include variations of the cut-off grade to indicate the relative robustness of the estimate to changes in cut-off grade. However, CIM reminds QPs that:

- NI 43-101, CIM Definition Standards and CIM Estimation Best Practice Guidelines specifically prohibit the disclosure of tonnes and grade that are not classified.
- The QP who is disclosing any estimate must make it clear in the text of the report that the other estimates are included only to demonstrate the sensitivity of the Mineral Resources and Mineral Reserves estimate to changes in cut-off grade and are not the QPs estimate of the Mineral Resources and Mineral Reserves for the property. The QP is cautioned that an estimate below the selected economic cut-off grade for the estimate may not meet the test of "reasonable prospects for eventual economic extraction". Form 43-101F1 – Item 14 (Instruction 2) notes as follows: *"Where multiple cut-off grade scenarios are presented, the qualified person must identify and highlight the base case, or preferred scenario. All*

estimates resulting from each of the cut-off grade scenarios must meet the test of reasonable prospect of economic extraction".

Further discussion on the cut-off grades

CIM is aware that in special cases a cut-off grade is not applied to a deposit. In certain circumstances, the contacts between the rock types define the mining limit, rather than an economic cut-off grade. Examples of this are diamonds in a kimberlite pipe or certain industrial mineral deposits. The QP must describe these special situations in the Technical Report.

Issue 3. – What is the appropriate level of support required for the selection of a cut-off grade? Should the completion of a scoping study be the minimum standard for supporting the determination of a cut-off grade?

In general, the appropriate level of support for the determination of cut-off grades varies according to the level of advancement of the property. The best available information should be used such as operational data for properties in production, current feasibility or pre-feasibility study information for projects with Mineral Reserves, or current PEA inputs if they are available for an early-stage project. For projects that do not have a current study with a sufficient level of detail, there is no minimum requirement for support, however, determination of any cut-off grade should, at least, involve consideration of commodity price, operating costs, metallurgical recovery and sales terms (if applicable). Where there is no data available, a review of comparable projects may be helpful in selecting reasonable inputs to a cut-off grade calculation.

Regardless of the level of support, it is important for the QP to disclose the parameters that were used to determine the cut-off grade(s) in the Technical Report.

Issue 4. – The definition of a preliminary feasibility or pre-feasibility study is general and lacks specific minimum requirements for each aspect or component of the study. Where can QPs go to get more information on the content of a preliminary feasibility study?

The CIM Standard Definitions (May 30, 2014) include a definition of a preliminary feasibility study and feasibility study but a description of the components of a preliminary feasibility study and feasibility study were not provided. Many companies have internal guidelines for preparing various levels of economic studies of mining projects.

In April 1, 2011 the Canadian Mineral Processors (CMP) published "NI 43-101 Best Practice Guidelines for Mineral Processors" which includes extensive summaries of the contents of various types of feasibility studies including Scoping Studies, Prefeasibility Studies, and Feasibility Studies. CMP also noted that the American Association of Cost Engineers (AACE) provides definitions and guidance for capital cost estimation at various levels of detail and effort.

Issue 5. - Disclosing different Mineral Resource classification categories for different metals in the same Mineral Resource estimate.

Industry practice is to disclose one estimate as the estimate of Mineral Resource or Mineral Reserve even if there is more than one commodity involved in estimate. If more than one commodity is used in the estimate and an estimate of quality is made on each commodity and reported, then the QP must consider the reliability of the data of each commodity and classify the entire estimate accordingly. Estimates of quality and quantity of individual commodities are never classified and reported separately.

In general, the CIM Definition Standards and CIM Best Practices deal with the estimation of Mineral Resources and Mineral Reserves for a deposit and generally assume that an estimate for the deposit will be made and then classified with the same classification being applied to both the tonnage and grade of the estimate. Tonnes and grade are both fundamental components of the estimate of Mineral Resources and Mineral Reserves. Nothing in the widely held deliberations on the CIM Definition Standards has arisen concerning the potential to have multiple grade classifications for the same estimate of tonnage.

The lowest classification should be used where a by-product or co-product has significant influence on overall economics. Otherwise, if there is insufficient data to classify the co-product then it should not be classified as a Mineral Resource.

Issue 6. – Disclosing third-party estimates. This issue is no longer applicable because of updates to NI 43-101: see Part 2.4 Disclosure of Historic Estimates in NI 43-101.

References:

- CIM Best Practice Guidelines for the Estimation of Mineral Resources and Reserves dated November 23, 2003.
- CIM guidelines on the "reasonable prospects" clause, published December 15, 2009.
- Best Practice Guidelines for Mineral Processors which includes extensive summaries of the contents for various types of technical reports dated April 1, 2011.
- Update of National Instrument 43-101 (NI 43-101) with the effective of June 30, 2011.
- BC Securities Commission 2012 Mining Report, published January 24, 2013
- CIM Standards and Definitions for Mineral Resources and Mineral Reserves approved by Council on May 30, 2014.
- Additional guidance on the "Reasonable Prospects of Eventual Economic Extraction" clause prepared by the CIM Best Practices Committee and issued November 20, 2014.

Committee Members
John Postle – Co-Chair
Bernie Haystead – Co-Chair
Jason Cox – RPA Inc.
Peter Dietrich – Scotiabank
Marc Legault – Agnico Eagle Mines Ltd.
Deborah McCombe – RPA Inc.
Ross Pritchard – Teck Corporation