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Via E-Mail: CommentLetters@ivsc.org

International Valuation Standards Council
41 Moorgate
LONDON EC2R 6PP
United Kingdom

Dear Sirs/Mesdames:

Re: Valuations in the Extractive Industries - Discussion Paper

On behalf of CIMVal as its Secretary, I am pleased to provide the attached answers to the questions raised in the International Valuation Standards Council Discussion Paper. We hope that you will find our comments of assistance.

CIMVal is the Special Committee of the Canadian Institute of Mining, Metallurgy and Petroleum on Valuation of Mineral Properties. CIMVal is comprised of experts in mineral project valuation (as opposed to oil and gas valuation). The Co-Chairs of CIMVal are Keith Spence and Bill Roscoe, who are copied on this letter and email. They look forward to answering any questions you may have.

CIMVal's *Standards and Guidelines for Valuation of Mineral Properties* (the "CIMVal Standards and Guidelines") were published in February 2003 and are available at www.cim.org/standards. We respectfully recommend that you consider the CIMVal Standards and Guidelines model in your current deliberations. The CIMVal Standards and Guidelines model was developed as a result of extensive study and consultation, and in many respects, has served as a precedent for the development of other valuation standards.

CIMVal has commenced a review of the CIMVal Standards and Guidelines that will take into account the Canadian mining industry's experience with it over the last ten years. We will be reviewing and updating the CIMVal Standards in parallel with similar processes to be undertaken by AusIM (Australia Institute of Mining & Metallurgy – Mining valuation standards) SAMVal (South Africa Institute of Mining & Metallurgy – Mining valuation standards). These three mining countries are part of a consensus group called IMVAL (International Mining Valuation Committee) and adhere to a “stage based” mining valuation approach as shown in the chart below.

Valuation Approaches for Different Stages of Mineral Properties or Projects

Valuation Approach	Exploration Properties	Mineral Resource Properties	Development Properties	Production Properties
Income	No	In some cases	Yes	Yes
Market	Yes	Yes	Yes	Yes
Cost	Yes	In some cases	No	No

We would like to see greater international standardization of valuation standards rather than additional models, and are hoping that through collaboration we can develop best practices in mineral valuation that are consistent with each other or shared.

We are advocates of having valuation standards for minerals that are separate from those for oil and gas for the reasons set out in our attached answers.

Thank you for your consideration of our materials and look forward to hearing from you in due course.

Yours truly,



Eden M. Oliver

EMO/kv
Enclosures

cc: *CIMVal Members:*
Keith Spence, *Global Mining Capital Corporation*
Bill Roscoe, *Roscoe Postle Associates Inc.*
David Scott, *CIBC*
Michael Fowler, *LOM Limited*
Marc Legault, *Agnico-Eagle Mines Limited*
Bruce McKnight, *Bruce McKnight Minerals Advisor Services*
Derek Melo, *KPMG LLP*
Michael Samis, *Ernst & Young LLP*
Pat Stephenson, *AMC Mining Consultants (Canada) Ltd.*



CANADIAN INSTITUTE OF MINING, METALLURGY AND PETROLEUM
SPECIAL COMMITTEE ON VALUATION – STANDARDS & GUIDELINES
(CIMVal) - Answers submitted October 22, 2012 in Response to Questions
in the IVSC Discussion Paper – Valuation in the Extractive Industries

Question #1 – Project Scope

Question 1.1 – Extractive Industries

Should IVSC produce combined standards and guidance for Extractive Industries or produce separate pronouncements for mining and for oil and gas? If you believe the latter please indicate the reasons why you consider separate guidance is appropriate.

- ▶ Separate standards and guidance are needed for mining and for oil & gas. The two industries are quite different in resource and reserve estimation, exploration, extraction and processing, risk profile of development and time to develop, and they have more varied stages of development and time horizons, a large variety of commodities with different markets and values, and more varied valuation methods, all of which makes it difficult to combine them for valuation purposes. There are significant differences in approaches to valuation for mining and for oil & gas.

Question 1.2 – Assets to be Included

a) Should the project focus just on the valuation of reserves and resources or should it extend to other assets employed in the industry and to entire businesses in the sector? Please provide reasons for your answer.

- ▶ Valuation of a project should include more than reserves and resources, but also exploration properties that do not have resources and reserves. Projects valuations should also include the total business of the project, but not the depreciable tangible property. The latter is also very specific and is already covered by guidelines (used by appraisers).

b) How often do you assess or use (if it is readily ascertainable) the value of an extractive business as a starting point for the valuation of reserves and resources?

- ▶ All the time. Very often for producing properties. Sometimes however, we usually approach it the other way around. The valuation of resources and reserves is the starting point for valuing a business. We start from reserves and resources rather than applying company values to assets.

Question 1.3 – Output Required from IVSC

Do you agree with the Board's preliminary view as to the type of pronouncements that IVSC should be making in relation to valuations in the Extractive Industries? If not please explain what alternative or additional material you believe would be useful.

- ▶ Please see the approach that has been taken in CIMVal Standards and Guidelines.

Question #2 – GN 14

In 2005 the IVSC issued "GN14" Valuation of Properties in the Extractive Industries. As explained in the introduction to this paper, the Board decided during its review and updating of all the standards and guidance issued prior to 2008 that a fundamental review of this Guidance Note was required. The Board felt that although it provided a detailed commentary on the classification of minerals and of the codes used for this purpose, it had comparatively little detail on practical valuation issues, methods that could be used and the merits of those methods in different circumstances. It therefore decided that the material in GN14 could not easily be carried forward as either an International Valuation Standard or as a Technical Information Paper without a fundamental reconsideration of the content. In 2010 the IVS Standards Board withdrew GN14 pending this current project.

a) Are you familiar with the former GN14?

- ▶ One of the Co-Chairs of the CIMVal Committee is a member of the Extractive Industries Task Force that prepared GN14, but the other members of the CIMVal Committee are not as familiar with, nor do they use, GN14.

b) Is GN 14 used in the valuations that you provide or receive?

- ▶ One of our members may follow GN14 in a general way in that it describes general industry practice, but our members primarily follow CIMVal.

c) What elements of GN 14 do you find useful in either reporting or interpreting valuations?

- ▶ See (b) above.

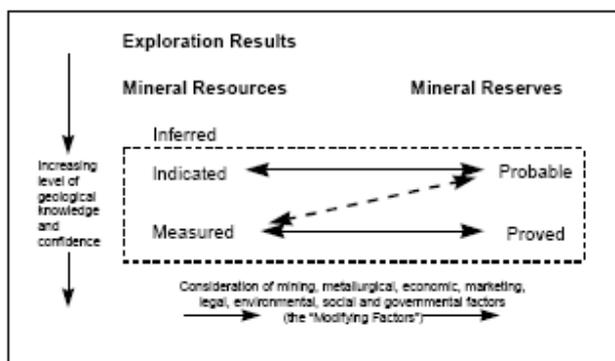
Question #3 – Reserves and Resources

Question 3.1 - Mineral Classification Codes.

GN 14 referenced the CRIRSCO and UNFC codes. However, the Board is aware that other codes are used for classifying minerals reserves and resources, including the PRMS Code for petroleum and the JORC for hard rock. Understanding the Codes used for identifying minerals is fundamental to the valuation of those assets.

a) Which classification code or codes are most commonly used in your industry / sector?

- ▶ CRIRSCO mineral reserve and resources code (specifically CIM Definition Standards, which are incorporated into NI 43-101) is most often used as it has been integrated into the CIMVal, JORC, SAMREC codes as defined in the following graphic:



- ▶ The UNFC code is very seldom used as it is considered unwieldy for application, however on occasion it is necessary to reconcile UNFC classification of resources and reserves with CIM.

b) Which code do you normally use or rely on?

- ▶ CIM - Canadian Institute of Mining, Metallurgy and Petroleum Definition Standards, which is part of CRIRSCO, and incorporated by reference into NI 43-101.

c) Are you aware of differences across your / industry sector on the classification codes used? If so please indicate whether these differences cause problems in undertaking or understanding valuations.

- ▶ The differences tend to be between countries on whether their mining companies adopt the CRIRSCO or UNFC system for mineral resource/ reserve classification. Most of the work of members of the CIMVal Committee has been with companies and countries using the CRIRSCO system, which reduces translation problems.
- ▶ Country codes within CRIRSCO are generally very similar. The UNFC, including China, is quite different as is the Russian Code. And yes, the non-CRIRSCO codes create valuation problems, which are lessened by reconciling with CRIRSCO definitions. Greater standardization with the use of CRIRSCO definitions would make multiple jurisdiction valuation easier.

Question #4 – Valuations methods in general

The IVS Framework identifies the three principal valuation approaches, the Market Approach, the Income Approach and the Cost Approach. Within each approach there are various methods that have evolved and that are used to a greater or lesser extent for different types of asset or in different markets. The Board understands that all three approaches are used in the Extractive Industries.

In the Extractive Industries the appropriateness of each approach or method will depend on a number of factors including:

- *Stage of project (exploration, development, and production),*
- *Ability to identify and classify extent of reserves or resources,*
- *Ability to project production rate*
- *Ability to project capital expenditure,*
- *Ability to project operating expenditure,*
- *Ability to forecast future prices for minerals/petroleum products,*
- *Existence of public information regarding comparable projects,*
- *Stage of regulatory approval, and ability to forecast risk in progressing to extraction (existence of environmental impact statements, etc),*
- *Certainty regarding title, and other legal considerations (non-regulatory),*
- *Availability of financing,*
- *Availability and financing of infrastructure,*
- *Marketing of resource considerations.*

While the IVSC cannot prescribe that a specific method be used for a given purpose, one of the objectives of this project will be identify those methods that are recognised as being appropriate in different situations.

Question 4.1 - General valuation methods.

a) Please identify the valuation methods that you most commonly use or encounter for valuing producing reserves, reserves undergoing development, reserves and resources subject to exploration?

If you are a valuation provider, please indicate why you prefer these methods. If you are a valuation user, please indicate if you are confident in the result obtained by these methods.

- ▶ *Producing reserves – income approach.*
- ▶ *Reserves undergoing development – income approach.*
- ▶ *Reserves and resources subject to exploration – Market and cost approach for early stage exploration properties. Market or income approaches for resources in more advanced stage exploration properties where there is at least preliminary information on mine design,*

technical feasibility, and geological information on structure, material amount and metal concentration of the deposit.

- ▶ We use the CRIRSCO categories reserve and resource types in valuation. The income approach is used for valuation of proven / probable reserves and measured / indicated resources whether at the development stage or as a producing project. Inferred mineral resources may be valued with the income approach in specific situations (e.g., technical reports and internal company studies). Inferred mineral resources are also valued with market methods. When projecting metal production, it is common to include only a portion of the resources.
- ▶ We generally use the income approach where there is sufficient information available to estimate future cash flows generated by a metals-related investment. The types of metals-related investments that we value range from:
 - a) pure commodity-linked derivatives for corporate risk management purposes,
 - b) assets with embedded commodity derivatives such as commodity-linked debt,
 - c) deferred financing or purchase arrangements tied directly / indirectly to commodity prices through a link to project production such as streaming agreements, royalties, or earn-ins, and
 - d) equity interests in the residual cash flow stream generated by a mining project.

The importance and link between metal investment cash flows and project production and technical characteristics increases from Bullets A to Bullet D. An income-based valuation framework is applied across all of these asset-types in a manner that conforms to generally accepted valuation principles and, depending on the situation, is consistent with valuation principles in accounting guidelines such as IFRS. The Discounted Cash Flow (“DCF”) method is used to adjust cash flow for risk and timing. However, these adjustments may be applied in one of two means. The first follows a standard DCF adjustment where net cash flow is adjusted for risk and time through a discounting process that relies on an aggregate discount rate. The second is a Certainty Equivalent (“CeQ DCF”) approach where a risk-adjusted net cash flow is calculated by applying a targeted risk adjustment to particular cash flow component (e.g., a pure copper risk adjustment applied to a copper based revenue stream). This risk-adjusted net cash flow is then adjusted for the time value of money and possibly a residual risk adjustment for uncertainties not explicitly accounted in the cash flow model. Note that the CEQ DCF approach is also used to value financial derivatives and has its own terminology (e.g., risk neutral valuation) in this context. We may then augment our cash flow model by modelling metal price and other uncertainties with a numerical technique (e.g., lattice techniques or simulation) to correct for biases created in a cash flow estimate by contingent cash flow structures the result of risk management, management flexibility, financing and taxation considerations.

We note that the CeQ DCF approach was not discussed in the Exposure Draft of the IVSC Technical Information Paper titled “*The Discounted Cash Flow (DCF) Method – Real Property and Business Valuations*” even though this method is a recognized DCF method for fair value estimates under accounting guidelines and well supported in valuation and finance theory literature. CeQ DCF is one of the approaches described in IFRS 13. We would highlight that the structure of the CeQ DCF approach is comparable to derivative

valuation methods used to value many financial assets and is used for select types of real assets such as natural resource projects.

- ▶ A cost and/or a market approach for early-stage exploration properties and for later stage development projects and operating properties.
- ▶ A cost approach for very early-stage exploration properties when there is little information on property geology beyond an indication that a minerals occurrence exists.
- ▶ Our experience has been that all of these methods provide valuation results that are supportable when applied with professionalism and discipline. We generally do not use a particular method in isolation and generally confirm the results from one approach with the results from a second approach.
- ▶ We commonly use DCF and comparable transactions (market approach) for producing reserves, reserves undergoing development and for reserves subject to exploration (whatever that means). For resources, we generally use comparable transactions and for exploration properties without reserves or resources, we use comparable transactions and the cost approach. As a valuator, these methods make the most sense and provide reasonable valuations that seem to reflect the market. See the CIMVal Guidelines and Standards for commentary on methodology.

Question #5 – Valuations Methods – Market Approach

The Market Approach provides an indication of value by comparing the subject asset with identical or similar assets for which price information is available. That price information may be for individual assets or a collection of assets that are utilised together in an extractive activity. Adjustments are frequently required to reflect differences between the reference asset and the subject asset and differences in timing. Price information is often analysed based on units of comparison, eg prices per tonne or multiples of earnings.

There are difficulties in applying the Market Approach in the Extractive Industries because extraction activities are heterogeneous in nature, meaning that it is often necessary to make significant adjustments to such price information that is available in relation to transactions involving similar assets. Examples of typical differences that may require transaction data to be adjusted include location factors, accessibility, cost of extraction, quality and status of reserve and the quality of the equipment used in the operation.

b) If you have experience of using the market approach to value assets, please indicate the sectors and asset types where this is used.

- ▶ The market approach is frequently used, especially regarding properties that do not have mineral resources. It is applied to all metallic and non-metallic commodities. For reserves and resources, we identify a set of comparables and develop a range of \$/unit metal or other commodity values to apply to the subject property's reserves or resources without adjusting individual comparables. For non-resource exploration properties, we use a set of comparables to develop a range of \$/unit area values to apply to the area of the subject property without adjusting individual comparables. Please see the two attached papers by William E. Roscoe for methodology.

c) *Please identify the three most important factors for which you frequently need to adjust price data when applying this approach.*

- ▶ Please see the attached papers referenced in the answer to question #5(b)
- ▶ Factors include location, stage of development, relative economics (grade, ease of mining), availability of infrastructure, and regulatory burden.

Question #6 – Valuations Methods – Discounted Cash Flow

The Discounted Cash Flow method is the most common method under the Income Approach and has many detailed variations. The IVSC’s TIP 1 “The Discounted Cash Flow Method” provides guidance on the principles involved in building a cash flow model. The Board is interested in exploring the diversity that exists when this method is applied in the Extractive Industries in order to identify where supplementary guidance may be required.

The Board is interested in learning which inputs are commonly used in projected cash flows, and the experience of valuation providers and users in their use.

Question 6.1 – Inputs commonly used in projected cash flows

a) *Production forecast – do you use internal production forecasts developed by the entity’s own geological and engineering specialists, external forecasts, or a combination of both?*

- ▶ We may use the internal production forecast of an entity, external forecasts or a combination of both, depending on what is available and appropriate. Internal forecasts are often used and adjusted for what we believe is likely to occur based on our professional judgement. Our valuation reports typically note the source of the production forecasts so that report readers are aware of the basis for the production forecast.

b) *Do you adjust the production forecasts for risk by reserve category?*

- ▶ Depending on the circumstances, production forecasts may be adjusted using a probability weight based on the amount of information attached to a particular resource.

c) *Do you make an explicit cash flow forecast through the term of expected production, even though it might be a very long period of time, or do you use a “remainder period” for long lived reserves? If you use a remainder period, typically over what period is your explicit forecast?*

- ▶ We generally use an explicit long-term cash flow forecast over the mine life. A 5-15 years forecast depending on mine plan available may be used. Depending on the circumstances, “remainder period” cash flows during that period may not be specifically disclosed in the attached reports. Very long-life base metal asset may require that long-term cash flows be explicitly modeled with a CeQ DCF approach because of price reversion in base metal prices (i.e. the tendency of metal price to revert to a long-term equilibrium level). This approach may be used if in the particular situation a standard DCF model with aggregate

risk adjustments to the net cash flow has difficulty recognizing the explicit risk characteristics of a cash flow stream.

- ▶ Where economic resources exist beyond the point at which reliable cash flow forecasts can be prepared, the “remainder period” values may be valued using a market approach
- ▶ There is no standard length for a remainder period. Remainder periods are typically taken into account only for very long life reserves and that are highly likely to be added to the mine plan.

d) *Do you use an internal management estimate for future pricing, e.g. the NYMEX, investment bank analysts' estimates, industry sources, or a combination thereof to estimate future prices? If using the NYMEX strip pricing, what are the typical assumptions you make for prices beyond the NYMEX strip (e.g., flat, inflationary growth, etc.) Do you consider the impact of any hedging of future prices that might be in place in estimating the future revenue stream?*

- ▶ We generally use a combination of sources to estimate forecast future metal prices, including management forecasts, spot prices, consensus forecasts from investment banks and forecasts derived from forward curves as the circumstances dictate. The choice of forecast reflects suitable analysis of the context and available data combined with professional valuation judgement to obtain what is considered the best forecast in the circumstances.
- ▶ We believe that in appropriate circumstances a commodity price forecast may be derived from its forward price curve. A forward price is the price at which two parties agree to sell or buy a set amount of commodity at a specific time in the future. The forward price is considered a risk-adjusted expected price since a party choosing to buy or sell a commodity in the future would first need to estimate what the spot price might be and then adjust this estimated price for variance around the forecast (i.e., applying a risk adjustment). The risk adjustment is used to back out a forecast commodity price from a forward curve based on the Capital Asset Pricing Model (“CAPM”).
- ▶ Note that some mining professionals oppose the use of forward curves in metal price forecasts. This opposition is often supported by citing concerns about liquidity, incomplete forward curves, or the observation that a forward price is a mathematical calculation. However, these reasons do not prevent the use of forward curves in generating a price forecast since they would also invalidate the use of derivative methods when generating cash flows and estimating value in a wide range of valuation problems. Ultimately, we consider the facts and circumstances of the valuation problem before deciding on the information that will be used to support a price forecast.
- ▶ Metal price forecasts based on the forward curve may be extended beyond the publicly quoted prices based on the characteristics of the metal (base metal or precious metal) and the market characteristics of the forward curve. Price forecasts based on the forward curve may be stated in real or nominal terms after recognizing that forward prices are quoted in nominal terms.

- ▶ The value impact of a hedging program may be considered if there is a program in place. Further, cash flow models may be adjusted to reflect the value impact of commodity derivatives that may be embedded in project financing or risk management programs. One of the considerations in that regard is the purpose of the valuation and whether there is a need to separate the value of the mineral interest and the value of the hedge position.

e) *Do you apply differentials to the future price estimates? If so, what is your source for estimated differentials?*

- ▶ We do not generally do so. Please see above.

f) *Do you reflect currency exchange risks to future income and operating cost projections in the cash flow or in the discount rate?*

- ▶ Yes, however currency forecasts generally are based on consensus. Currency exchange risks may be recognized in the discount rate if a conventional DCF model is used. When a DCF model is used, the currency exchange rate risks can be captured through either the currency forward curve or consensus forecasts.

g) *Do you include corporate overheads when estimating the value of mining, oil and gas reserves, or just the selling, general and administrative costs associated with operating and producing the reserves?*

- ▶ In valuation of mineral reserves and resources, selling costs and G&A associated with the particular reserves and resources are recognized when valuing a particular mining property. Corporate overheads may or may not be recognized depending on the purpose for which the valuation is prepared (valuation of mining properties as opposed to valuation of the shares of a corporation) and the facts and circumstances that guide market participant views.

h) *How often do you use the DCF method to value probable or possible reserves?*

- ▶ Measured and Indicated resources are often included in an income approach valuation. Inferred mineral resources may be included in an income approach valuation after recognizing their uncertain and unproven characteristics through either a probability weighting or an increase in discount rate.

The Board is aware that there is significant diversity in the approach adopted for deriving the discount rate when using a discounted cash flow method. IVSC TIP 1 "The Discounted Cash Flow Method" makes it clear that the discount rate should reflect the time value of money and the relative risks associated with the asset. Those risks can be divided into market (or

systematic) risks and asset or entity specific risks. The discount rate also has to reflect the nature of the cash flows to which it is being applied.

The following have been identified as some of the common factors that are reflected in discount rates in the industry:

- Stage of development,
 - Stage of production (eg [**decreasing not increasing?**] increasing discount rates as production forecast changes from probable to proven reserves),
 - Whether applied uniformly to the net income or with separate discount rates to expenditures (such as necessary CAPEX) and higher rates to operating income,
 - Weighted-Average-Cost-of-Capital for the sector,
 - Country risk premia
 - Size premia,
 - Project and/or asset specific risk,
 - Inflation,
 - How aggressive the pricing assumptions are in the cash flow, ie if more aggressive pricing assumptions are used a higher discount rate than would be used for more conservative assumptions would be appropriate.
- ▶ Aggressiveness of production forecast more likely than price - for price usually use consensus.

Question 6.2 – Selecting discount rates in the mining industry

a) *What methods do you use or are familiar with for determining the discount rate used for valuations of reserves and resources?*

- ▶ We may use a Weighted Average Cost of Capital to determine an appropriate discount rate for a project and may also use a project specific discount rate when building a conventional DCF model. The discount rate is estimated within a Capital Asset Pricing Model (“CAPM”) framework.
- ▶ As market value is based on market participant approaches and views, where market participants have generally adopted particular discount rates for given types of mining properties, we may consider those rates or may use those rates as a “base rate” and adjust for particular risks of other characteristics.
- ▶ A CeQ DCF approach does not make use of an aggregate discount rate though an implied aggregate discount rate can be derived. The CeQ approach uses targeted risk-adjustments for select cash flow components. These adjustments are done within the CAPM framework. Market related uncertainties such as metal and energy prices are risk-adjusted with the CAPM while project-specific uncertainties may be modelled directly with no risk-

adjustment. A residual risk adjustment may be necessary to adjust previously risk-adjusted cash flows for risk not explicitly recognized in the model before a final adjustment for the time value of money. The residual risk adjustment is similar in nature to a Credit Valuation Adjustment applied in derivative valuation for counter-party risk.

b) Do you separately consider and evaluate market (systemic) risk and asset specific risk?

- ▶ Risk adjustments and discount rates are selected considering both systemic risk and asset specific risk. The CAPM is used to estimate systemic risk adjustments and asset specific risk adjustments are chosen after considering publicly available information or the professional judgement of specialists. Systemic risk in metal price is often a significant and separate consideration.
- ▶ We take account of market risk if we are valuing a company or project acquired by a company. Otherwise, we would generally focus on asset specific risk.

c) Please indicate the factors that you normally consider and reflect in the discount rate and any source you use to determine the appropriate rate adjustment.

- ▶ Time value of money – Risk-free government bond yields.
- ▶ Systemic risk premium for equity or commodities – CAPM framework, computed Betas or market Betas from market information service, econometric analysis of market data such as historic spot prices or forward curves for the analysis of commodity price risk.
- ▶ Debt yields – Corporate bond yields based on proxy credit rating
- ▶ Size premium – Morningstar data service
- ▶ Country risk premia – analyst reports on relative country risk, relative government bond yields, review of political risk insurance data, political risk commentaries.
- ▶ Investment or project specific – adjustment for project stage or type of investment that is based on specialist opinion and market information.
- ▶ Residual risk (CeQ DCF approach) – a discount rate adjustment for uncertainties and risks not explicitly reflected in the CeQ model.
- ▶ Technical and development risk – consideration of discounts applied by analysts in relation to comparable projects, engineering reports that identify the complexity of the mineral processing and mining processes.
- ▶ Capital cost risk – consideration of contingency factors included in cost estimates, cost over-run experience in comparable projects, and the relation of capital cost to project value.
- ▶ Permitting risk – review of regulatory regime and project progress; consideration of approval experience of other projects; and consideration of jurisdiction/country and property specific community relations, aboriginal relations and “social license to operate” information.

d) *Do you use multiple discount rates to reflect the changing risk profile as an extractive process moves through its life cycle?*

- ▶ Sometimes. For example, in cases where a static DCF method is being used, higher discount rates may be applied to reflect uncertainties not related to time (such as applying higher discount rates to more geologically uncertain resources). A by-product of using the CeQ DCF method is that effective aggregate discount rate implied by this analysis can change with the variation of cash flow uncertainty as a result of a changes in operating leverage and other project characteristics. This may be one reason that this approach is used.

Question #7 – Valuations Methods – Cost Approach

The Cost Approach can be applied in the Extractive Industries when there is either no relevant transactional data that can be applied to use a Market Approach or sufficiently reliable income projections to use an Income Approach.

The IVSC's TIP 2 The Cost Approach for Tangible Assets² describes the common application and methods used under the Cost Approach. Common difficulties in applying a Cost Approach include identifying the cost of an equivalent asset and establishing the appropriate depreciation allowances to reflect physical, functional or economic obsolescence. The Board is interested in learning what assets are commonly valued using the Cost Approach in the Extractive Industries and the inputs used to determine replacement cost and appropriate depreciation adjustments.

a) *Please indicate what methods you use or are familiar with that fall under the Cost Approach and that are used in valuing assets in the Extractive Industries.*

- ▶ Please see the CIMVal Standards and Guidelines.
- ▶ Some of our members use the cost approach from time to time, specifically a technique with the unfortunate name appraised value method to value exploration properties without resources or reserves. It is described in the attached 2003 paper prepared by William E. Roscoe. Applicable to answers to Question # 7(a), (b) and (c).
- ▶ Retained expenditures, precedent transactions - most likely in exploration properties or JV's.

b) *If you use or are familiar with the Cost Approach, please indicate in your experience how the cost of an equivalent asset is determined.*

- ▶ See answer to Question #7(a)

c) *If you use or are familiar with the Cost Approach, please indicate the three most common adjustments that are made in your experience to reflect physical, functional or economic obsolescence, and what metrics are used to determine these adjustments.*

- ▶ See answer to Question #7(a)

Question #8 – Treatment of Contributing or Complementary Assets

In paragraph 1.2 the need to consider the possible impact of complementary assets involved in the extraction process on the value of each of those assets is mentioned. This is most obviously an issue when using a discounted cash flow method as a combination of assets may contribute to the overall cash flow associated with a particular extractive activity, eg the reserve, infrastructure for access and shipping, plant & equipment and technical know-how. Also, there may be assets that either do not contribute towards the cash flows used in the analysis that may be of value, or that contribute to the cash flows but not to their full potential. However, where other methods are used, eg a market approach or cost approach, the need still arises to consider the particular combination of assets and the affect this has on the value of either the whole activity or to individual assets employed within it.

In considering the assets that may be complementary, there is also a need to determine the appropriate aggregation of assets to be assumed, or the “unit of valuation”. The IVS Framework states that it is important to clearly define whether it is the whole group or individual assets that are to be valued and if the latter, if the other assets are assumed to be available to a buyer or whether the asset is to be considered in isolation. This has parallels to the concept of the “unit of account” or “cash generating unit” described in the International Financial Reporting Standards, but is applicable in valuations for all other purposes.

Some national codes for mineral valuation define mineral assets as all property including, but not limited to, real property, intellectual property, extraction rights, exploration rights, plant, equipment and infrastructure required for the development, extraction and processing of minerals.

In the 2010 Discussion Paper prepared by the IASB the following was proposed:

3.63 The legal rights to extract minerals or oil and gas are the foundation of the unit of account. In considering the extent to which plant and equipment assets should also be included within this unit of account, the following possible dimensions of the unit of account have been identified:

- (a) the rights associated with a specific property including any development works to access the deposit plus any plant and equipment used to produce the deposit; or*
- (b) the rights associated with a specific property including any development works to access the deposit but excluding plant and equipment assets that are physically and commercially separable from the property rights. Consequently, any plant and equipment assets that are used to gain access to or to produce the minerals or oil and gas and are separable from the property rights are treated as separate assets.*

a) How should the unit of valuation (unit of account) be determined in the valuation of extractive activities?

b) How is double counting of the contribution of different assets avoided?

- ▶ Through residual approach, or contributory asset charges.

c) *How should economic obsolescence or impairment, if present, be allocated proportionally to all contributory assets of the mineral asset?*

▶ Depends.

d) *What methods do you use or are familiar with to attribute value to specific contributory assets?*

▶ Depends.

e) *Are entity specific inputs appropriate when valuing contributory assets in extractive activities? What checks can be made on the reasonableness of entity specific inputs?*

f) *Should components of goodwill other than value of assembled workforce be recognised?*

▶ Not appropriate in property valuations.

▶ Potential not reflect in DCF (both on prices and volume).

Question #9 – Asset Retirement Obligations

Reinstatement and other asset retirement obligations (AROs) vary significantly between different locations and types of reserve or resource. The Board has seen evidence of a wide diversity in the approach to placing a value (negative) on such liabilities. While most methods involve estimating the current costs of restoration and restitution based on obligations imposed by contract or law, the methods used to discount these sums to reflect the fact that they are not due until a future date vary significantly.

a) *How do you estimate the cost of future reinstatement or environmental protection obligations?*

▶ Typically out of the notes of the balance sheet, from engineering work, and company or third party expert assessments.

b) *Do you discount the future cost of reinstatement obligations using a risk free rate or another rate? If another rate please identify and provide rationale for this approach.*

- ▶ Generally using a risk-free rate or the same discount rate due to same level of accuracy as other projections/estimates unless extenuating circumstances or pertinent information is available.

Question #10 – Reliance on Specialists

A competent valuer in the Extractive Industries can be expected to have a thorough understanding of the economics of the industry, the demand for and the market price for the mineral in question. However, it is normal that in order to provide a valuation they will need to rely on inputs from third party specialists such as geologists to identify the nature and extent of the reserve and engineers to determine the feasibility and costs of exploitation.

The Board has received evidence that some valuers provide valuations based on the third party inputs without undertaking any investigation or enquiry to satisfy themselves as to the reasonableness or otherwise of the data. This in turn has led to users questioning the validity of the valuation conclusions.

a) If you provide valuations of mineral assets, what investigations do you undertake to established the reasonableness or otherwise of estimates of the extent of reserves or resources provided by geologists?

- ▶ We typically look at the technical reports and if we are comfortable that it is reasonable to do so, we will rely on the estimates. This includes track record of the engineering firm and qualifications of the author(s).
- ▶ We may also undertake site visits, due diligence interviews, etc. with experts, and conduct an internal technical review of the documents.
- ▶ If we prepare a fully compliant CIMVal valuation, we are required to review resources, reserves, cost estimates, economic assumptions, etc that support the valuation, and satisfy ourselves that they are reasonable. This can be done through appropriately qualified experts (Qualified Person in Canada) or through reliance on a Canadian National Instrument 43-101 Technical Report. If we prepare a non-CIMVal compliant valuation, we commonly rely on information provided by the client on which to base the valuation. This also answers Questions #10 (b) and (c).

b) If you provide valuations of mineral assets, are you routinely provided with estimates from engineers of the cost and feasibility of extraction? What enquiries do you make to satisfy yourself as to the reasonableness of these estimates?

- ▶ Please see answer under Question #10(a) above.

c) If you are a recipient or other user of valuations of assets in the Extractive Industries, are you satisfied that the valuations properly reflect any uncertainties in the current estimates of

either the extent of the reserves or the costs of recovery? What information would you expect to see in a valuation report that would improve your understanding of the sensitivity of the reported value to uncertainties in the identified reserve or the costs of recovery?

- ▶ Please see answer under Question #10(a) above.
- ▶ Should produce a range of values based on the sensitivity of metal prices, etc.

Question #11 – Intangibles and Goodwill

There can be significant intangible assets associated with extractive activities. Examples include drill hole databases, computer software, procedure manuals, employee handbooks, operating manuals, engineering drawings, patents, environmental approvals, licences and materials and services supplier contracts.

IVS 210 Intangible Assets sets out principles to be observed when undertaking a valuation of intangible assets and TIP 3 The Valuation of Intangible Assets³ provides additional guidance including a discussion of the commonly accepted methods used for valuing different types of asset. The IVS contains the following definitions:

Intangible Asset: “A non-monetary asset that manifests itself by its economic properties. It does not have physical substance but grants rights and economic benefits to its owner.”

Goodwill: Any future economic benefit arising from a business, an interest in a business or from the use of a group of assets which is not separable.

Goodwill is therefore a type of Intangible Asset but is distinguishable from other Intangible Assets in that it is not separable from the business. This definition of Goodwill is a valuation definition that reflects the fact that in some transactions value can be attributed to an Intangible Asset that is identifiable but not separable from the business. It differs from the definition in IFRS 3 and some other accounting literature which define goodwill as a residual amount after the deduction of the value of all identifiable tangible and intangible assets from the acquisition price of a business.

The Board observes that in comparison with other industries the output of many Extractive Industries are highly fungible commodities and therefore the value attaching to a producer’s brand, trademarks or customer relationships is relatively low compared with other industries. In contrast the value attaching to knowledge of reserves and resources, an assembled workforce and the know-how on the most effective means of recovery, particularly where advances in technology allow previously uneconomic reserves to be exploited, can be significant.

The Board is interested in learning what intangible assets are commonly exchanged between entities in the Extractive Industries and the approaches used to value these, as well as those assets that are customarily separately identified and valued for acquisition accounting under IFRS 3 or any similar accounting requirement.

a) Please identify any intangible assets that are normally separately identified and valued;

i. In transactions between entities in the Extractive Industries and

ii. When accounting for the acquisition of a business in the Extractive Industries.

- ▶ The biggest factor would be a management premium.
- ▶ Depends, but off-market contracts, technology (sometimes).

b) In your experience what, if any, value is attributed to components of goodwill, eg an assembled skilled workforce, in corporate transactions in the Extractive Industries. Please briefly indicate any valuation techniques used to establish the value of goodwill in such circumstances.

- ▶ Use a lower discount rate for example.
- ▶ Not usually performed.
- ▶ When goodwill is created through an acquisition we get involved in valuing the assets of the acquired entity. We value the mineral assets on an annual basis as part of impairment testing.

c) When considering the valuation of previously uneconomic reserves that can now be recovered using advanced technology, eg shale gas, deep water drilling, do you attribute an element of the overall value to the intellectual property involved? If so please explain briefly the method used to estimate this.

- ▶ Yes. Approach depends, but might use an option valuation.

Question #12 – Government Regulation

Mineral resources are subject to significant Government control around the world. Different regimes have different laws on ownership minerals in the ground, eg do they run with the surface rights or not, rights of extraction and the operating and restoration obligations required of operators. Also Extractive Activities are subject to specific fiscal policies, that can change without warning.

The Board is interested in examples of where firstly the legislative frameworks in different jurisdictions result in otherwise similar reserves or extractive activities having a significantly different value and, secondly, where unexpected or unforeseen changes have had a significant impact on value.

a) Please provide any examples of which you are aware of significant differences between the value of otherwise similar resources arising solely from different Governmental policies.

- ▶ Resource valuation in different countries can vary dependent on country regulation. A Russian resource would be valued lower than a Canadian resource, for example. Use the Fraser Institute's rating system.

- ▶ In our use of comparable transactions for valuation, we try to choose comparable transactions on properties in countries that are similar politically since otherwise similar properties have different values in different political regimes.
- ▶ Royalty and tax; government ownership policies; foreign ownership restrictions are relevant considerations.

b) Please indicate how “country risk” factors are reflected in the way in which you price or value extractive assets.

- ▶ Either in the discount rate or through the NAV multiple.
- ▶ Discount rate, assumed government ownership if not yet legislated. Sovereign bond ratings, cost of political risk insurance, country risk ranking by various publications can assist in determining appropriate country risk.