

VALUATION & APPRAISAL OF MINERAL PROJECTS

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Presenters:

Robert Adamson

BSc., MSc. (Hons. Geology), MAusIMM, CP (Geology), MAIMVA (CMV), MMICA, MPESA

John McIntyre

BE. (Hons. Mining), FAusIMM, CP (Mining), MAIMVA (CMV), MAIMA (CMA), MMICA

Carlos Sorentino

PhD, MEnvSt, Dip RadioIsotopesTech, BE(Chem). MAIMVA(CMV), MACS, MMICA, FAusIMM(CPEnv)(CPMan)

THE VALUATION OF MINERAL PROJECTS



DISCLAIMER

This paper has been prepared for the purposes of discussion into the use and application of appraisal methods used for the valuation of exploration properties and in proposed, new and operating mines. It makes reference to the Valmin Code, 2005 Edition and the JORC Code 2013 and contains opinions and comments that are intended to assist in the understanding of technical issues that arise in valuation and technical due diligence. It is aimed solely at educational issues in relation to those objectives and should not be used or relied upon for any other purpose. The opinions expressed herein are those of the authors and do not necessarily reflect those of any organisation or company that may be involved in mineral industry valuation or appraisal activities.

VALUATION & APPRAISAL OF MINERAL PROJECTS

PART I

THE VALUATION OF MINERAL PROJECTS

TOPICS:

Part 1

- **Why are valuations required?**
- **How are valuations carried out?**

Part 2

- **Who does a valuation?**
- **What are the roles of Valuers and Technical Appraisers?**
- **What is AIMVA?**

WHY ARE VALUATIONS REQUIRED?

Corporations Act, Australian Stock Exchange Listing Rules , State Revenue laws:

- Valuation of mineral tenements/projects vended into IPOs
- Mergers & takeovers (fairness and reasonableness reports)
- State stamp duties on transfer of mineral titles – Offices of State Revenue etc.
- Valuations for Directors, Receivers/Administrators, prospective purchasers etc.
- Commercial disputes - Expert Witness to State & Federal Courts
- Compulsory acquisition compensation

Other Jurisdictions:

- e.g. Stock Exchanges of Singapore, Hong Kong, Toronto, Johannesburg

HOW ARE VALUATIONS CARRIED OUT ?

The VALMIN Code:

Guiding principles - NOT a handbook on methodology

Fundamental Principles

- Materiality
- Competence
- Independence
- Transparency

The JORC Code: Provides the basis for Mineral Resource and Ore Reserve estimates

Technical Appraisals :

Critically evaluated technical data is the foundation of competent valuation

- Resources/Reserves - grades, consistency
- Technical - mining issues, metallurgical aspects
- Engineering & Financial considerations - capex, opex
- Environmental aspects, closure costs, liabilities
- Markets, product quality & price, penalty elements, exchange rates
- Geopolitics & Sovereign Risk

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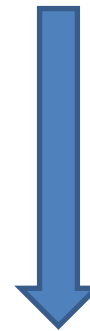


HOW ARE VALUATIONS CARRIED OUT?

GETTING STARTED:

Classify the Mineral Asset/Project :

- Exploration Areas
- Advanced Exploration Areas
- Pre-Development Projects (Preliminary FS)
- Development Projects (Definitive FS)
- Operating Mines



Increasing geological knowledge

Decreasing uncertainty

Consideration & Selection of Appropriate Valuation Methodologies:

- Cost - based
- Income - based
- Market - based

HOW ARE VALUATIONS CARRIED OUT?

Exploration properties (Properties without defined resources)

COST-BASED: Exploration (properties without Defined Resources)

- **Multiples of Exploration Expenditures (MEE) Method**
Relevant Exploration Expenditure X Prospectivity Enhancement Multiplier (PEM)
- **Kilburn Geoscience Rating (KGR) Method**
Property Acquisition Unit Cost X Area X Ratings (0.1 to 10) for four Factors
- **Joint Venture/Earn-in Terms**

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M.E.E. METHOD - TYPICAL PROSPECTIVITY ENHANCEMENT MULTIPLIERS

CATEGORY	TECHNICAL APPRAISAL	APPLICABLE PEM RANGE
1	Limited potential for mineralisation of economic significance and/or prospectivity has been downgraded by exploration carried out prior to valuation date.	0.5 – 0.9
2	Exploration data (historical and/or current) consists of pre-drilling surveys with results sufficiently encouraging to warrant further exploration.	1.0 – 1.4
3	One or more prospects defined by geology, geochemistry and/or geophysics to the extent they present drill targets having likely economic potential.	1.5 – 1.9
4	One or more targets with significantly mineralised drill hole intersections within a clearly prospective geological context.	2.0 – 2.4
5	Exploration well advanced and infill drilling warranted in order to define or up-grade to the stage that mineral resources can be estimated.	2.5 – 2.9
6	Indicated resources have been defined but a pre-feasibility study has not recently been completed.	3.0

e.g. \$50,000 X 1.2 = \$60,000 (say, \$50,000 to \$70,000)

How a PEM is chosen?

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KILBURN GEOSCIENCE RATING METHOD – TYPICAL FACTORS & RATINGS

Rating	Off property factor	On property factor	Anomaly factor	Geological factor
0.1				Unfavourable lithology
0.4				Generally favourable lithology (10%-20%)
0.5			Extensive previous exploration with poor results	Favourable lithology 50%)
1.0	No known mineralization Minor workings Several old workings Abundant workings		No targets outlined	Favourable lithology (70%)
1.5				
2.0			Several well defined targets	Favourable lithology with structures
2.5			Several significant sub-economic intersections	
3.0				Favourable lithology with structures along strike of a major mine
3.5	Abundant workings/mines with significant historical production			
4.0	Along strike from world class mine(s)	Major mine with significant historical production	Several significant ore grade co- relatable intersections	
5.0				
10.0				

e.g. **\$500/km²** x 25km² X 1.5 (On Property) X 1.5 (Off Property) X 1.0 (Anomaly) X 2.0 (Geological)
= \$56,250 (say, \$50,000 to \$70,000)

Central to this valuation method is the estimation of the **unit value** for exploration properties. Without empirical research, this unit value is often estimated in a highly subjective manner.

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The Joint Venture Valuation Method

A JV is a *cooperative arrangement* where two or more partners join in a commercial undertaking, a *prospect* and each partner makes a contribution. The expectation is that by agreeing to cooperate, *each partner derives a larger benefit than the one it would obtain individually*. For this reason, at the time the JV is formed, their cooperation increases the net present value of the prospect and the value is:

$$NPV_{JV} \geq NPV_A + NPV_B$$

The JV Valuation method:

- Requires recent JV on comparable properties
- Assumes that expenditure commitments are related in some systematic way to the inherent value of the properties
- Does not reflect the fact that most properties are put up for JV because the owner puts a very low value on them...
- It is often methodologically confusing and therefore confused.

HOW ARE VALUATIONS CARRIED OUT?

METHODS:

INCOME-BASED: Existing Operations or Definitive Feasibility Studies (DFS)

- Net Present Value (NPV) by Discounted Cash Flow (DCF)

MARKET-BASED: Comparable Exploration and Operational Entities

- Comparable transactions on Enterprise Value (EV) basis
- Yardstick methods (factors based on Production, Reserve/Resource Exposure)
- Share trading multiples (Enterprise Value; Resources)

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HOW ARE VALUATIONS CARRIED OUT?

THE RESULTS:

Valuation Date: all valuations have an “as at” date (ie. time dependency)

Types of Value:

- **Technical (Intrinsic)Value**
- **Fair Market Value** (Technical/Market Value modified by a premium or discount)

Basis of Value:

Cost-based Technical Values - principle of contribution to value through expenditure

Income-based Technical Values - based on revenue and cash flow to provide NPV

Market-based Market Values - comparison with “similar transactions” involving “similar entities”

The NPV may not be the price a Buyer will pay; Buyers may discount further for risk to get to FMV, or under certain circumstances, may offer a premium.

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HOW ARE VALUATIONS CARRIED OUT ?

FINALLY:

VALUATION IS NOT AN EXACT SCIENCE – it is an **OPINION** as to a realistic range of values

VALUE ESTIMATES ARE SUBJECTIVE - “beauty is in the eye of the beholder”

VALUATIONS by competent and experienced valuers are “best estimates” based upon the best available information together with subjective, experience-based inputs by the Valuer

COMPETENT VALUATIONS ARE EXPRESSED AS:

- The results of more than one methodology, if possible
- A **Range** (Low – High)
- A **Preferred Value** taken within the Range
- Appropriately rounded figures
- Clear statements of data shortcomings , project risks, estimation risk, etc

Transparency of methodology and of the subjective inputs/modifiers, together with appropriate risk assessment provides a basis for confidence in value estimates.

A VALUATION IS AN EXPERT’S BEST OPINION AT THE TIME IT IS EXPRESSED

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PART II

WHO DOES A VALUATION?

Experts & Specialists (VALMIN 2005, Sections 37 & D10)

Experts may be (i) “Independent” or (ii) “Representative”

(i) INDEPENDENT (INDIVIDUAL)

If acting as an Independent Expert, you must:

- a) Be Competent (>10 years general experience, >5 years valuation)
- b) Be an industry professional, technically qualified
- c) Be a Member of an appropriate Professional Association

(ii) “REPRESENTATIVE EXPERT”

If acting as a Representative Expert , you must:

- (a) Be Competent; or
- (b) Use a “Senior Specialist” or
- (c) Engage technical Specialists.

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WHAT IS AIMVA?

- AIMVA was formed specifically to provide a formal Australasian qualification that licenses its members to perform as recognised professionals in minerals valuation.
- AIMVA members are certified as qualified in their field through experience and practice and must adhere to and comply with a Code of Ethics
- AIMVA requires members to demonstrate, to a board of their peers, competence in valuation/appraisal and to provide proof as professionally-qualified expert mineral industry practitioners of >10 years of experience
- AIMVA's code of practice is based on the fundamental objectives of competence, reasonableness, transparency and independence
- AIMVA specifies that, as appropriate, members must comply with applicable codes of practice, including JORC, VALMIN, NI 43-101 and similar, depending on the jurisdiction
- AIMVA specifies that members must be Members of an appropriate Professional Association, with an enforceable Code of Ethics

AIMVA QUALIFICATIONS - VALUERS AND TECHNICAL APPRAISERS

VALUERS

Under AIMVA, Valuers have >10 years of validated experience in valuation and are specifically and uniquely qualified to apply their experience and knowledge of the industry and the mineral property market to value:

- exploration properties;
- mineral properties;
- mining projects under development; and
- operating mines

They must be familiar with the selection and use of appropriate methodologies to arrive at “arm’s length” independent valuations & suitably experienced in valuation

APPRAISERS

- Appraisers typically provide specialised technical support & advice to valuers
- They are professionally-qualified mineral industry specialists with >5 years of experience who would qualify as Competent Persons in their field of expertise

SOME VALUATIONS

- EXAMPLES
- ANALYSES
- CONCLUSIONS

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CASE STUDY 1 – COAL EXPLORATION LICENSES VALUATION

1) INITIAL VALUATION - December 2010 - Succeeded

- IPO - \$12M for 37.5% - ie. notional company value ~\$32M
- (implied exploration value ~\$34M, with >\$2M debt)

2) SECOND VALUATION – June 2012 – Transaction failed

- Placement of \$28M for 37.5% - ie. notional co. value ~\$76M
- Independent Valuation of exploration assets ~\$51m (\$5M cash)
- Hybrid Valuation – target t, discounted by 15%, then by 99.6%!
- Thus \$28M for 37% - (\$76m vs ~\$56M) Fair & Reasonable!

3) THIRD VALUATION – Nov. 2013 – advice to shareholders

- Market Capitalisation ~\$19M, incl. net cash ~\$3M
- Independent Valuation of Exploration properties ~\$18m

4) FINAL VALUATION – Actual Transaction - December 2013

- “Real” Value ~\$26M offer (paper) for 100% - Fair & Reasonable

CASE STUDY 1 – COAL VALUATION (continued)

THIRD VALUATION - Details

Tenements >9,000km² EPCs and EPCAs, total expenditure \$17M, total JORC Resources (Inferred) 370Mt

Five Methods of Valuation used for comparison (7 if IPO (2010) & 2012 included!):

a) “Recent Transaction Multiples” Method - \$21M value

- Valued over 3 years, \$/t of resource (\$0.01-\$0.39), thermal coals only
- Weighted average based on Enterprise Value (\$0.13/t resource)
- Valuation bottom end of range (dated values) of \$0.04-0.07/t

b) “Comparable Resource Multiples” Method - \$19M value

- Valued over 1 year, EV \$/t of resource (\$0.01-\$0.08)
- Applied \$0.04/t as value, range \$0.03-0.06/t

c) “Exploration Expenditure” Method - \$15M Value

- Productivity Enhancement Multiplied (“PEM”)
- PEM of 1.4 for JORC Inferred, 1.2 adjoining operating mines, 0.5 elsewhere

d) “Market Cap” Valuation - Exploration ~\$16m (ex. Cash assets/liabilities)

e) “Other Valuations” – Share price, based on broker reports – Value \$16M

DERIVED VALUE: \$18M, Range \$14M-\$21M

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CASE STUDY 2 – EPITHERMAL GOLD /PORPHYRY COPPER EXPLORATION PROPERTY – PHILIPPINES

- 2007: 50km² property purchased : **\$US 3.0M** **Gold ~ \$US700/oz**
- 2010: Valuation using KGR Method :
\$US1.6 to 10.3, **Pref FMV \$US 5M** **Gold ~US1,300/oz**
- 2011: Geol mapping, sampling ~180 small mines, exp \$US1.2M
- 2011 : Valuation using MEE & KGR Methods:
\$US 9.7M to 22.4M, **Pref FMV \$US 15M** **Gold ~\$US1,700/oz**
- 2012: Ground IP , expenditure **\$US0.85M**
- 2013: Valuation using MEE Method:
\$US 9.8M to 13.8M, **Pref FMV \$US 12M** **Gold ~1,350/oz**

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CASE STUDY 3– GOLD OPERATIONS VALUATION

1) INITIAL VALUATION

- Two operating gold mines, low margin, limited reserves
- NPV valuation, based on spending additional \$30M capital
- Value assessed as **A\$35M-45M**

DERIVED VALUE: A\$40M, Range A\$35M-A\$45M

2) ACTUAL TRANSACTION

Set up a document room, invited due diligence and offers:

- Interested party requested meeting, offered \$60M, opening bid
- MD too shocked to reply
- Offer immediately increased to \$70M
- MD recovering, but still speechless
- Final offer \$80M, accepted with alacrity, signed on the spot

ACTUAL VALUE: A\$80M, Seller's shareholders delighted!

SURVEY OF IPO VALUATIONS (1995-2002)

(after R Schodde, 2003)

- Survey of 107 mineral exploration companies listed in that period
- Valuations varied widely with area of property – generally + ve correlation
- Early stage projects tended to have lower values
- At a given stage of exploration, gold, base metals & diamond projects all tended to have similar values (no coal in this survey)
- Value loosely related to level of historical expenditures
- One month after listing, most companies had market values approx. 60% to 70% of the IPO value (= property valuations + cash raise)

- THE END -

QUESTION TIME