

# **Betting on Discovery Exploration**

**Presented by John Kaiser**

**2017 Metals Investor Forum**

**January 20, 2017  
Vancouver, Canada**

# **Presentation Outline**

**Where do the 4 core narratives stand?**

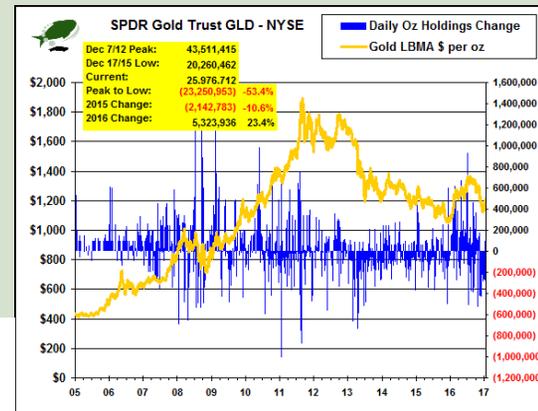
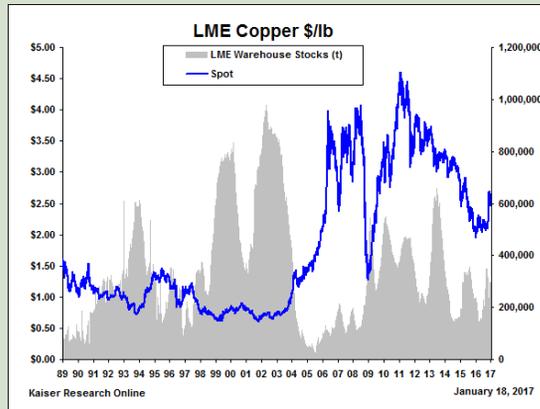
**How should you think about discovery exploration?**

**What stands in the way of resource juniors?**

**What is my solution to the problem?**

# The Four Core Resource Sector Narratives – where to focus?

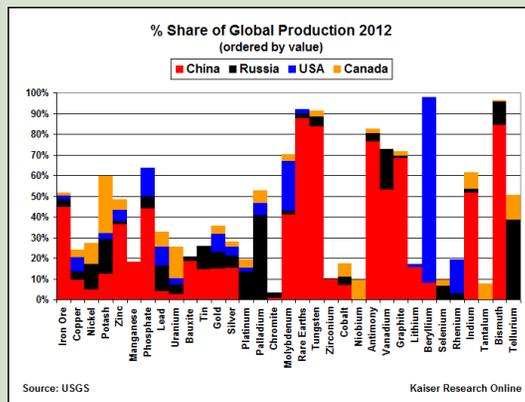
Commodity Cycle



Gold Bug

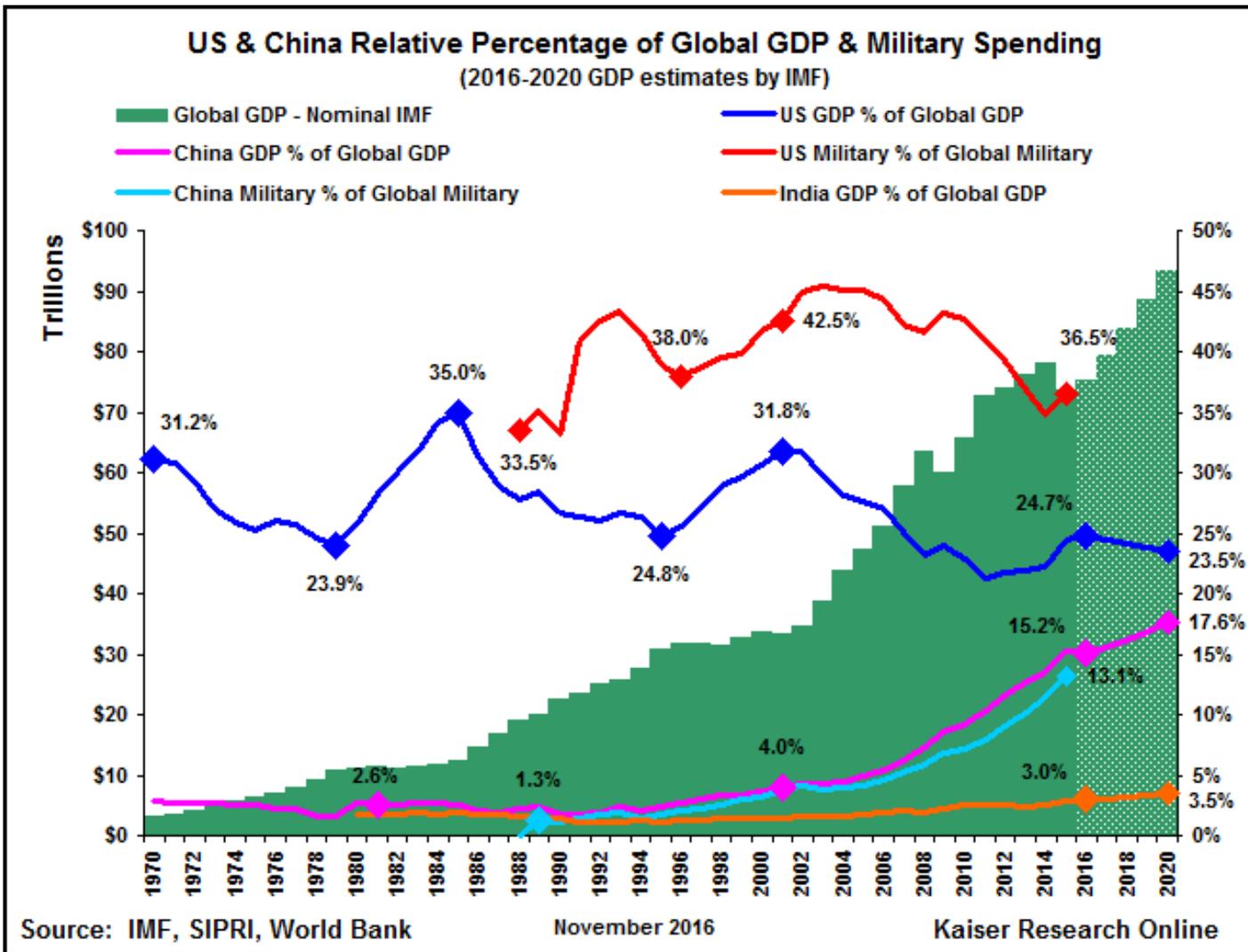


Security of Supply



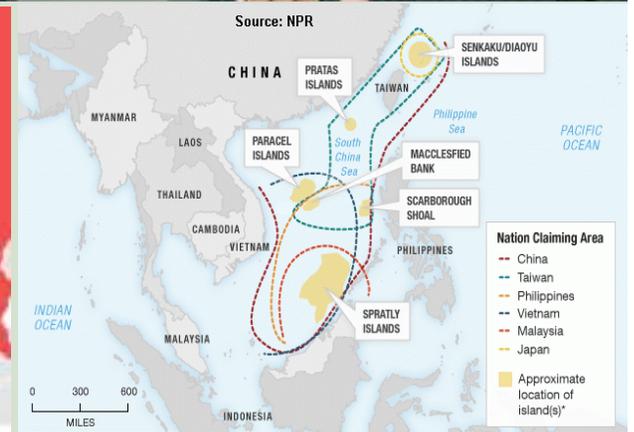
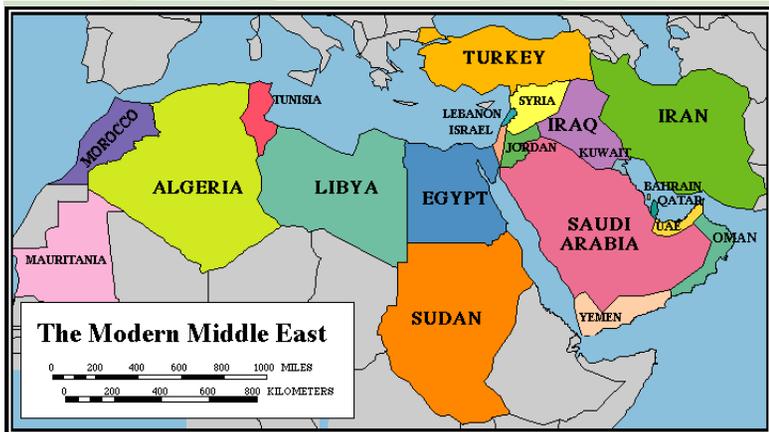
Discovery Exploration

Infrastructure Boom? Geopolitical Chaos? America Debasement? New Discoveries?



Can Trump reverse America's long term relative decline, or is that the wrong question?

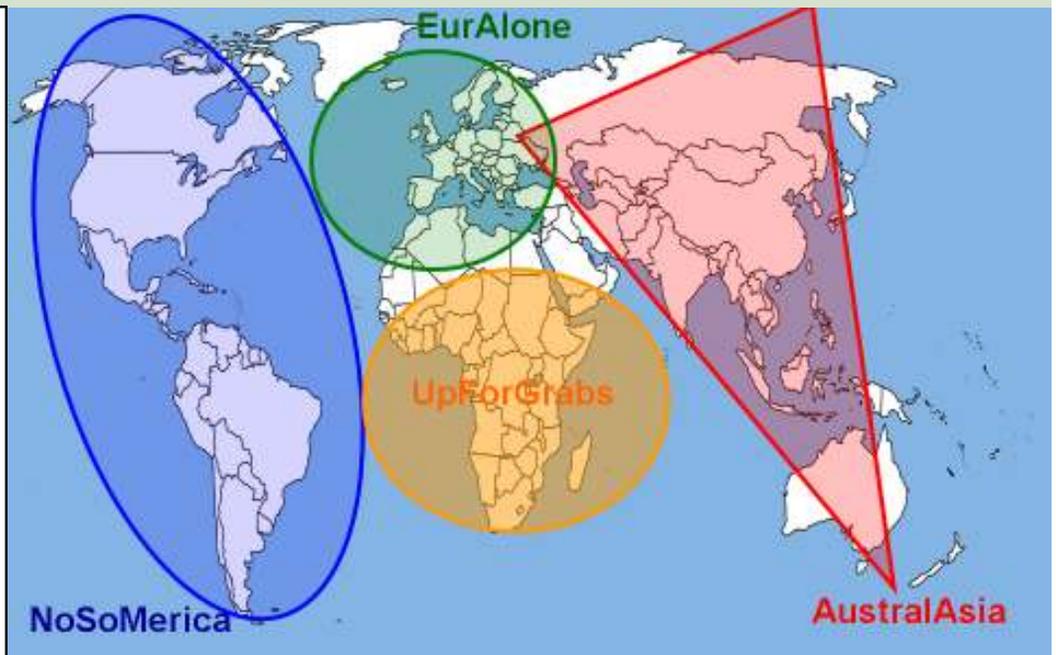
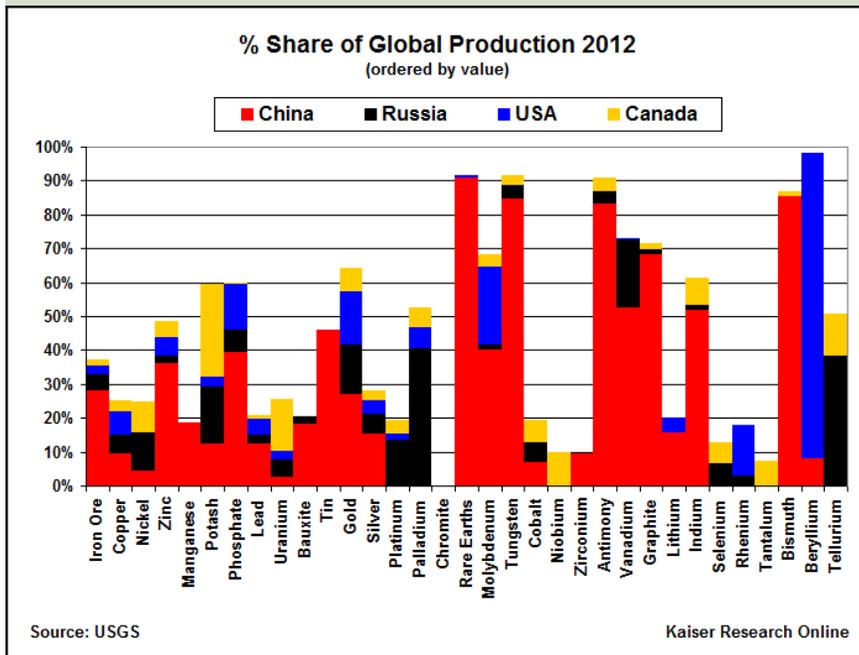
# Major Flashpoints As Russia & China push the envelope



# Security of Supply Narratives

- Geopolitical supply disruptions
- Policy Demand Drivers
- Process Innovation
- Transportation supply disruptions
- Policy Supply Disrupters
- Functionality innovation
- Deposit depletion
- Usage Innovation
- Fashion Trends

**This will be the new conceptual frontier for institutional capital!**





# *China to Pillory, or Praise, Cities Based on Water Pollution*

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Sinosphere

By EDWARD WONG JULY 7, 2016



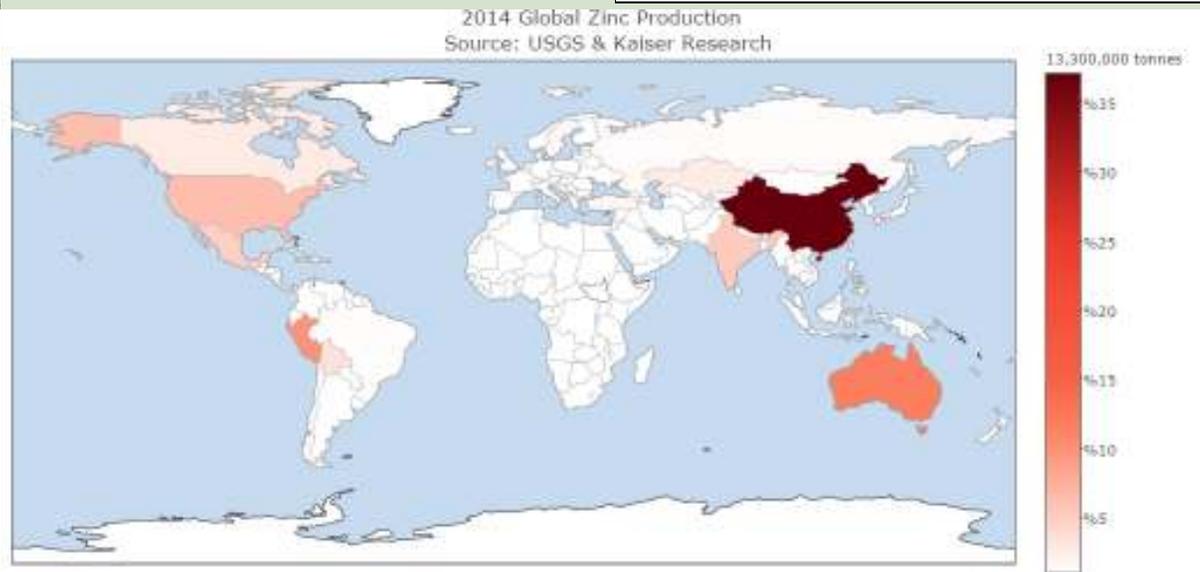
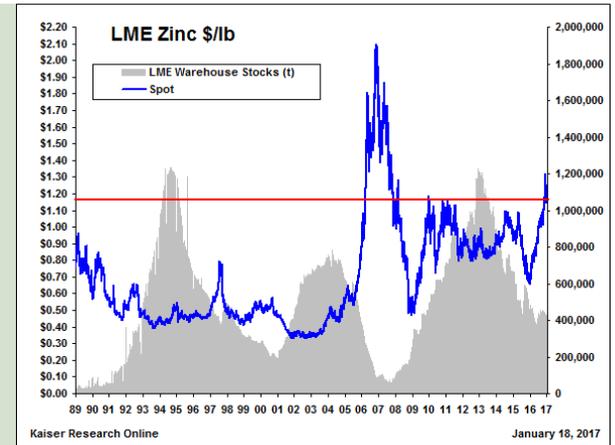
## China's Environmental Awakening

Environmental Policy as Supply Disrupter

**Robert Friedland:**  
“the combination or corruption and pollution is toxic to the future of the Chinese Communist Party”

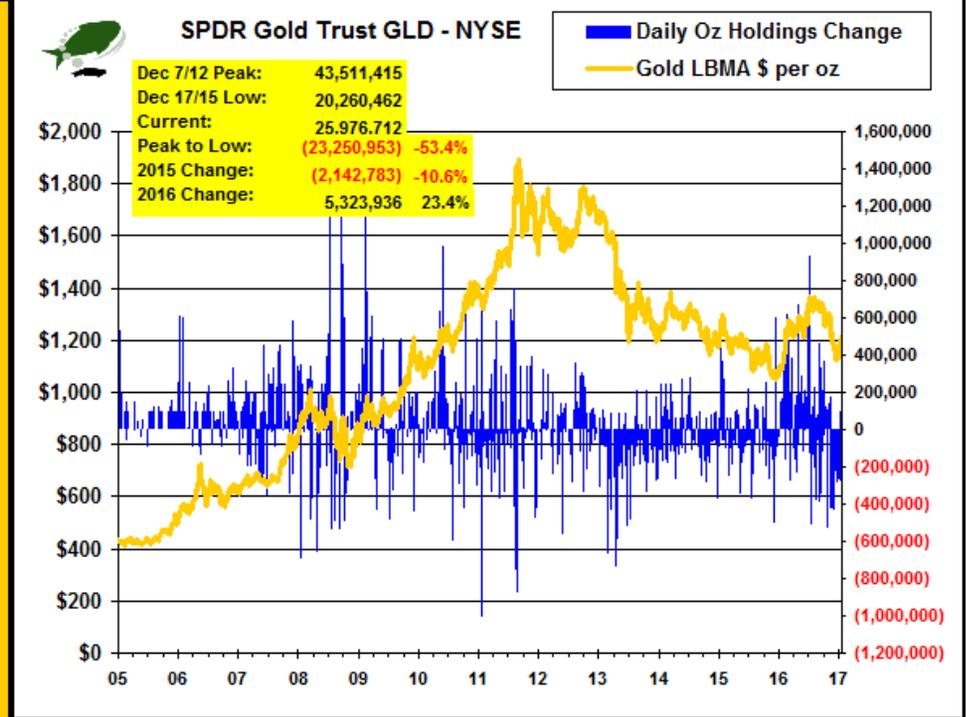
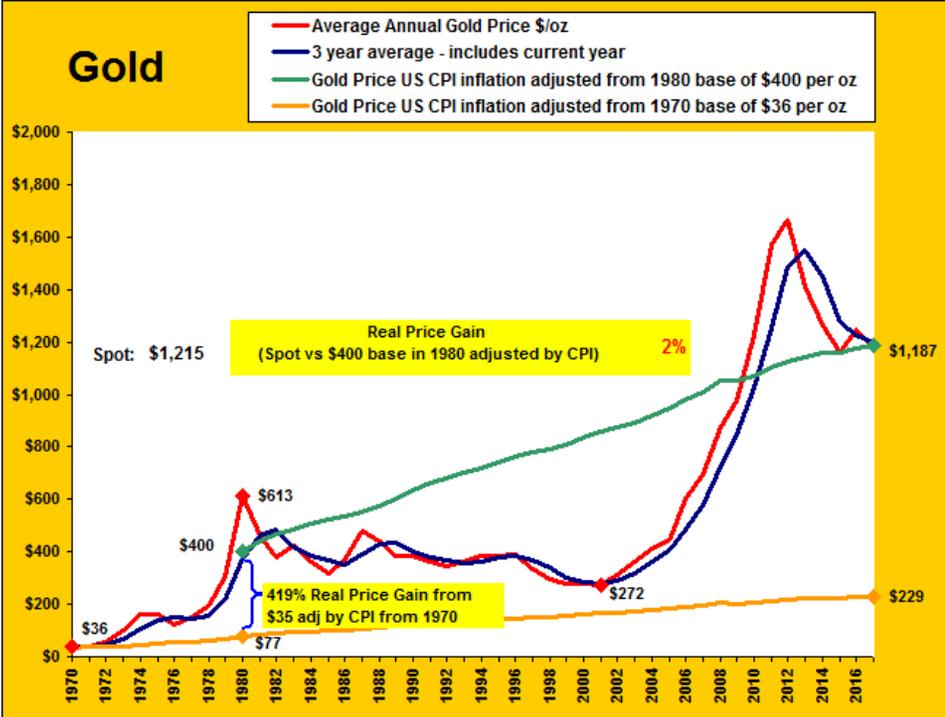
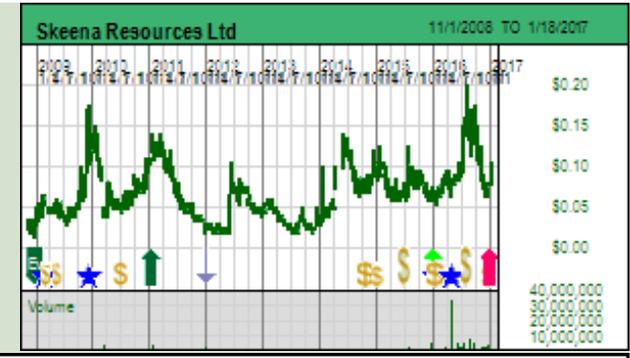
**Mines & Money, Toronto,  
September 2016**

Are you long a good zinc play?





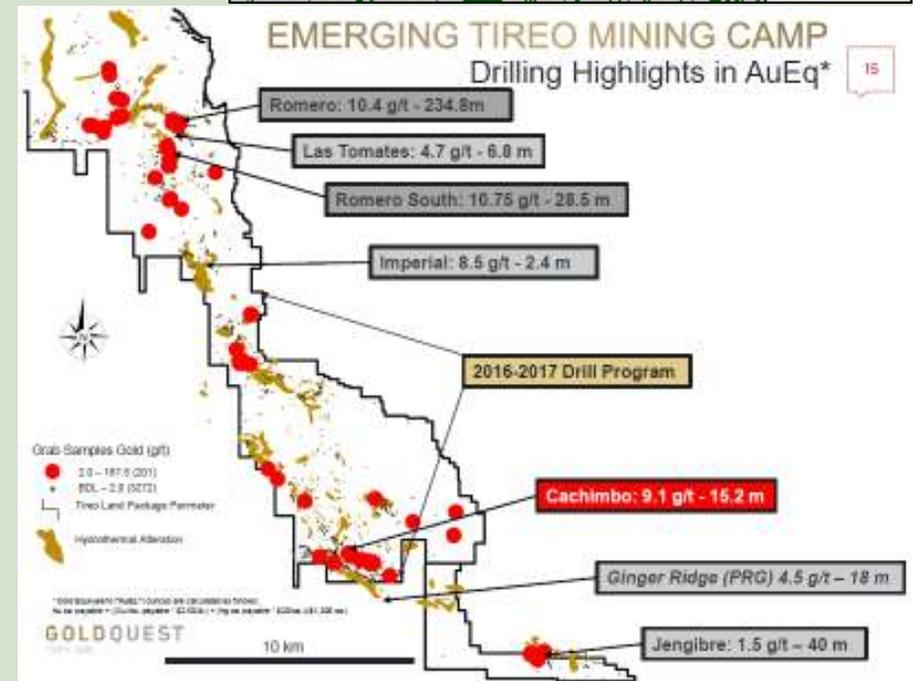
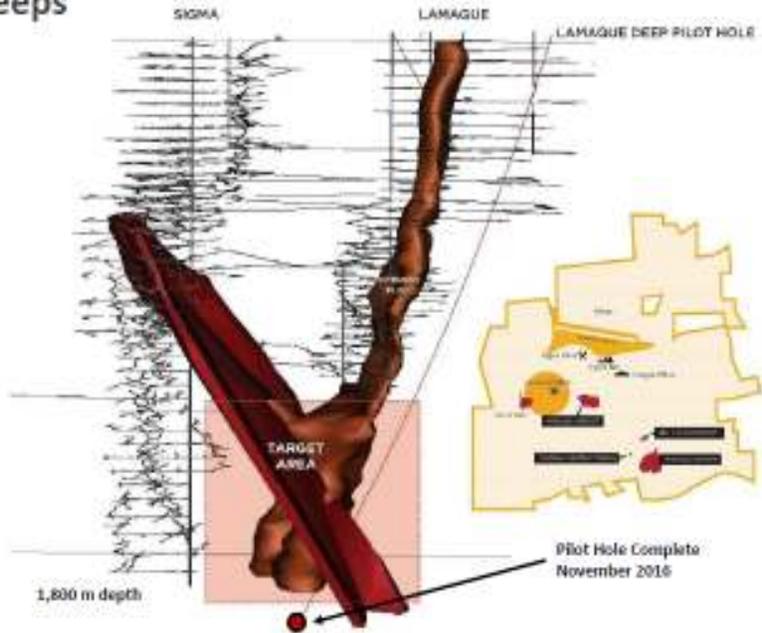
**Simple Optionality vs Hybrid Optionality: Hibernate & Pray or Spend to Explore?**





# Hybrid Optionality: district or internal exploration?

**Lamaque Deeps**



# Discovery Exploration: an alternative to optionality gambling

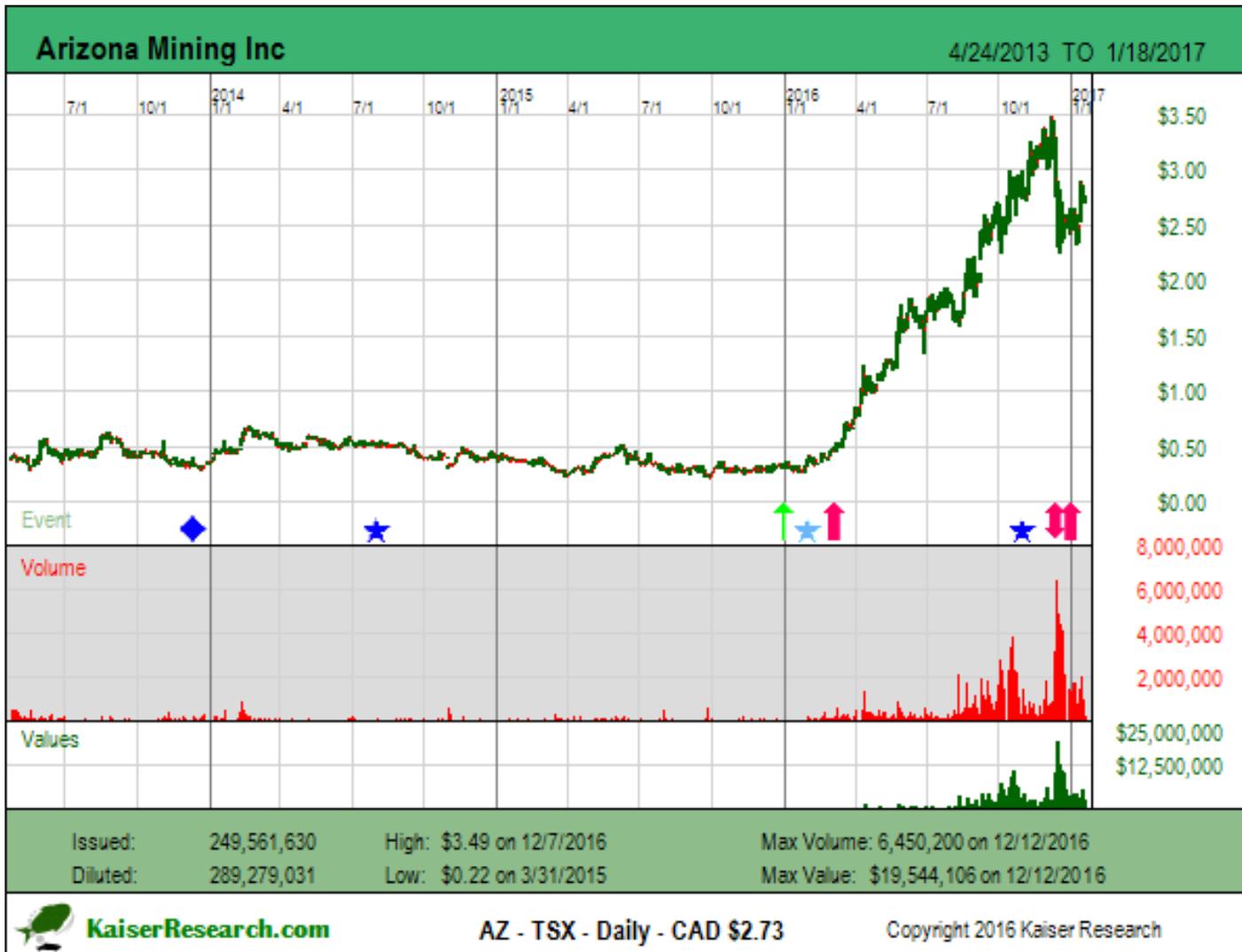
Exploring for deposits that are economic at the metal prices we have.

- 1) grassroots exploration
- 2) applying new exploration methods
- 3) rethinking existing systems
- 4) prospect generator farmout model



Discovery Watch is a weekly 15-20 minute audio show produced by [HoweStreet.com](http://HoweStreet.com) where Jim Goddard interviews John Kaiser about resource juniors with interesting exploration plays that have caught John's attention. The projects will not be limited to companies he has covered as Bottom-Fish and Spec Value Hunter picks. He will briefly describe each project's goal and its timeline. These projects will generally be exploration plays that have not yet turned into a discovery. The objective of Discovery Watch is to alert audiences to the existence of earlier stage exploration projects before they become big discoveries. Jim and John will periodically circle back to review the outcome. Should one of the projects deliver a discovery Jim and John will monitor that discovery on a more frequent basis.





**The best performing junior of 2016 was a discovery exploration story. Did I get lucky or was there a method?**

Detailed Visualized Outcome (KRO Members Only)								Cost Scenario					
VU = Very Unsure		SU = Somewhat Unsure		SS = Somewhat Sure		VS = Very Sure			Currency	USD Cost	Exchange Rate		
The confidence indicator is intended to convey the visualizer's degree of uncertainty with regard to a particular assumption.								<b>CapEx:</b>					
								\$400,000,000	VU	USD	\$400,000,000	1.000	
								<b>Sustaining Capital:</b>					
								\$100,000,000	VU	USD	\$100,000,000	1.000	
								<b>Mining Cost (\$/t rock):</b>					
								\$40.00	SU	USD	\$40.00	1.000	
								<b>Mining Cost (\$/t ore):</b>					
								\$40.00		USD	\$40.00	1.000	
								<b>Processing Cost (\$/t):</b>					
								\$13.00	SU	USD	\$13.00	1.000	
								<b>Other Cost (\$/t):</b>					
								\$11.00	SS	USD	\$11.00	1.000	
								<b>Total OpEx (\$/t):</b>					
								\$64.00		USD	\$64.00	1.000	
								<b>Zinc Concentrate Cost (\$/t con):</b>					
								\$210.00		USD	\$210.00	1.000	
								<b>Lead Concentrate Cost (\$/t con):</b>					
								\$210.00	SU	USD	\$210.00	1.000	
								<b>Metal 1 Con Cost Note:</b> \$60/t transport cost (Trail smelter), \$150/t smelter treatment charge is half way between \$200 high and current \$100/t. Concentrate grades based on bench scale metallurgical studies by AZ.					
								<b>Metal 2 Con Cost Note:</b> \$60/t transport cost, \$150/t smelter treatment charge.					
Mining Scenario								Risk Factors - Risk-Adjusted Discount Rate: 8.0%					
<b>Tonnage:</b>		80,000,000		SU	<b>Strip Rate:</b>		0.0		VS	<b>Infrastructure:</b>	Very Low	0.5	SU
<b>Operating Rate (tpd):</b>		10,000		SS	<b>Mining Type:</b>		Underground		VS	<b>Environmental Permitting:</b>	High	1.5	SU
<b>Mine Life (years):</b>		21.9			<b>Startup:</b>		2022		VU	<b>Technical:</b>	Very Low	1.0	SU
<b>Tax Treatment:</b>		DDBM - double declining balance		VU	<b>Tax Rate:</b>		42.0%		SS	<b>Social License:</b>	Low	1.0	SS
<b>Operating Rate Note:</b> Management initially played with a 8,000-10,000 tpd mining rate but has changed its focus to a 6,000-8,000 tpd rate, probably because that is within reach of the zone so far outlined. It is possible that if drilling expands the tonnage and improves grade, the higher mining rate will be considered for the PEA.													
<b>Mining Type Note:</b> The CRD sulphide zone at Hermosa-Taylor starts at about 250 m depth and dips at 25 degrees to the northwest. Just over 2,000 m from the pit base on claims beyond the Trench patented claims several older Asarco holes intersected the CRD zone at depths of 1,300-1,600 m, which offers a strong case for the hypothesis that the CRD zone continues at least another 1,300 m down dip from the limit of the Feb 2016 resource estimate. In addition, because 2015 drilling was confined to a strip of patented claims, the CRD zone so far outlined may represent only a third of the width of the zone.													
<b>Est Startup Year Note:</b> Expect deposit delineation and PEA in 2016, a PFS in 2017, and an EIS-FS in 2018. Although Arizona can be a difficult place to permit an open-pit mine, Taylor's location on patented claims and its underground mining nature promise to generate less permitting opposition than an open-pit mine on unpatented land under the administration of the forest service.													
<b>Tax Rate Note:</b> Federal 35%, state 7%.													
										<b>Title:</b>	Low	1.0	SU
										<b>Tax:</b>	Very Low	0.5	SS
										<b>GeoPolitical:</b>	Very Low	1.0	VS
										<b>Financing:</b>	Low	1.0	SS

**Visualized Outcome Summary: Arizona Mining - Hermosa-Taylor**

**Deposit Scenario:** 80,000,000 t @ 7.00% Zinc, 7.00% Lead, 90.0 g/t Silver, 0.14% Copper

**Mining Scenario:** Underground 10,000 tpd 21.9 yrs, CapEx \$400.0 million, SustCapEx \$100.0 million, OpEx \$64.00/t (USD)

**LOM Payable:** 8.9 billion lb zinc, 10.9 billion lb lead, 198.0 million oz silver, 120.0 million lb copper

**Economic Outcome (USD): Revenue Model at OV designated Metal Prices**

	Annual Average	Life of Mine (LOM)	LOM Stats
<b>Recoverable Revenue:</b>	\$1,156,650,906	\$25,351,252,736	\$317/t ore Recoverable Value:
<b>Smelter/Transport Costs:</b>	(\$256,900,388)	(\$5,630,693,440)	22.2% of Recoverable Revenue
<b>Gross Payable Revenue:</b>	\$899,750,518	\$19,720,559,296	77.8% of Recoverable Revenue
<b>Royalties:</b>	(\$26,992,516)	(\$591,616,779)	3.0% of Gross Payable Revenue
<b>Net Payable Revenue:</b>	\$872,758,002	\$19,128,942,517	75.5% of Recoverable Revenue
<b>Mining Cost:</b>	(\$146,000,000)	(\$3,200,000,000)	61% of OpEx - \$40.00/t ore
<b>Processing Cost:</b>	(\$47,450,000)	(\$1,040,000,000)	20% of OpEx - \$13.00/t ore
<b>Other Cost:</b>	(\$40,150,000)	(\$880,000,000)	17% of OpEx - \$11.00/t ore
<b>Sustaining Cost:</b>	(\$4,545,455)	(\$100,000,000)	2% of OpEx - \$1.25/t ore
<b>Total Operating Cost:</b>	(\$238,145,455)	(\$5,220,000,000)	27% of Net Payable Revenue - OpEx - \$65.25/t ore
<b>Pre-Tax Cash Flow:</b>	\$634,612,548	\$13,908,942,517	73% of Net Payable Revenue - \$173.86/t ore
<b>Taxes:</b>	(\$258,537,270)	(\$5,673,755,857)	41% of Pre-Tax Cash Flow - \$70.92/t ore
<b>After-Tax Cash Flow:</b>	\$376,075,278	\$8,235,186,660	43% of Net Payable Revenue - \$102.94/t ore

**Note:** Concentrate transport costs, smelter treatment costs and retention are subtracted from recoverable revenue to get gross payable revenue to which the uncapped royalty rate for the project is applied. The annual average of LOM sustaining cost is expensed as an annual operating cost. Annual average figures reflect full production years.

**Input 30 plus numerical variables along with qualifying notes to design your orebody and mine, click submit, and generate an after-tax NPV and IRR using Life-of-Mine annual averages.**

**What good is that?**

**The project is still pre-economic study.**

## Valuation: Discounted Cash Flow Model (DCF)

$$\sum_{n=1}^m \frac{\text{Annual Cash Flow}}{(1 + \text{Discount Rate})^n}$$

Minus Capital Cost  


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 = Net Present Value

n = year of cash  
 m = mine life (years)

<b>Annual Revenue</b>	
less	Operating Costs
<hr/>	
=	Pre-Tax Cash Flow
less	Taxes
<hr/>	
=	After Tax Cash Flow

Note: if n=0 then the capital cost can be included as an initial negative value in the cash flow series because anything to the power of 0 =1. VBA functions start with n=1.

# Risk Adjustment: Intrinsic Value vs Speculative Value

**Intrinsic Value = Discounted Cash Flow Model (DCF) applied to a mine**

**Fair Value of a Bet = probability X value of a potential outcome**

**Speculative Value = probability of a potential mine X such a mine's DCF value**

## The 6 Numbers you need to Gamble on Discovery Exploration

- After Tax Net Present Value (NPV)
- After Tax Internal Rate of Return (IRR)
- Discount Rate
- Project Net Interest
- Fully Diluted Shares
- Stock Price

**Future Stock Target:  $NPV \times Net\ Interest / Fully\ Diluted$**

**Implied Market Value:  $Fully\ Diluted \times Stock\ price / Net\ Interest$**

# A Risk Factor adjusted Discount Rate is not enough

Risk Factors - Risk-Adjusted Discount Rate: 8.0%				
	Risk Level	Risk Weight	Confidence	Note
<b>Environmental Permitting:</b>	High	1.5	SU	Permitting a mine in the USA is always a problem given the cost-dumping, self-centered "not-in-my-backyard-but-give-me-cheap-my-goods" mindset of America's elite. However, the location on patented claims and the underground nature of the mine, coupled with experienced management in terms of mine building and permitting suggests this could be easier built than an open-pit mine.
<b>Social License:</b>	Low	1.0	SS	The patented claims imply no aboriginal issues, though "retired" people living in the general area may resist a mine because it gives them something to do. The most unhappy group is likely to be drug smugglers and human traffickers, but Trump's plan to have Mexico build a great big wall could put an end to that complaint.
<b>Title:</b>	Low	1.0	SU	The project was acquired out of a bankruptcy in 2006. Title problems should have arrived by now.
<b>Tax:</b>	Very Low	0.5	SS	With 42% combined federal and state income tax already, the chance of higher income tax rates is very low, though the imposition of a government royalty is always a background risk.
<b>GeoPolitical:</b>	Very Low	1.0	VS	Given the nonsense spewed by leading presidential nomination candidates, one has to wonder about the risk of instability sweeping the USA. However, global geopolitical chaos is a plus for Hermosa-Taylor because it will underline the wisdom of developing a major new domestic supply of zinc and lead.
<b>Infrastructure:</b>	Very Low	0.5	SU	The fact that the much bigger Hermosa-Central plan yielded a positive PFS (at base case prices) indicates few problems for the much smaller scale Hermosa-Taylor operation in terms of power, rail and water.
<b>Technical:</b>	Very Low	1.0	SU	The CRD sulphide deposit does not appear to have any metallurgical issues, and seems to track the contact between the carbonates and overlying volcanics quite nicely. A key technical question is to what extent a continuous sweet spot is present with a mineable grade at or above the inferred resource grade.
<b>Management:</b>	Very Low	0.5	SS	AZI has an impressive management team: CEO Jim Gowans is an accomplished mine builder, having built the Red Dog and Polaris zinc mines, Chairman Richard Warke has two buyouts worth \$2 billion in his recent track record, one of them Augusta's Rosemont mine in Arizona, plus a huge equity stake in AZI, so raising \$15-\$20 million in 2016 is plausible at higher stock prices. Don Taylor knows Hermosa inside-out, Johnny Pappas helped get Romarco's Haile gold project permitted despite a "wetlands" obstacle course.
<b>Financing:</b>	Low	1.0	SS	\$10 million sale of 1% NSR to Osisko funds PEA. Management has track record raising feasibility scale funding for 100% owned project, but dilution risk exists.

We use the discount rate to adjust for company-project specific risk. Note: the algorithm is very simple - it adds the risk weight factors assigned to the risk type based on the user choice.

Risk Factor Weight Table				
	Very Low	Low	High	Very High
<b>Environmental Permitting:</b>	0.5	1.0	1.5	2.0
<b>Social License:</b>	0.5	1.0	1.5	2.0
<b>Title:</b>	0.5	1.0	1.5	2.0
<b>Tax:</b>	0.5	1.0	1.5	2.0
<b>GeoPolitical:</b>	0.5	1.0	1.5	2.0
<b>Infrastructure:</b>	0.5	1.5	2.5	4.0
<b>Technical:</b>	1.0	2.5	4.0	5.5
<b>Management:</b>	0.5	1.5	3.0	4.0
<b>Financing:</b>	0.5	1.0	1.5	2.0

The risk adjusted discount rate is the sum of the weight of the risk level assigned to each risk factor.

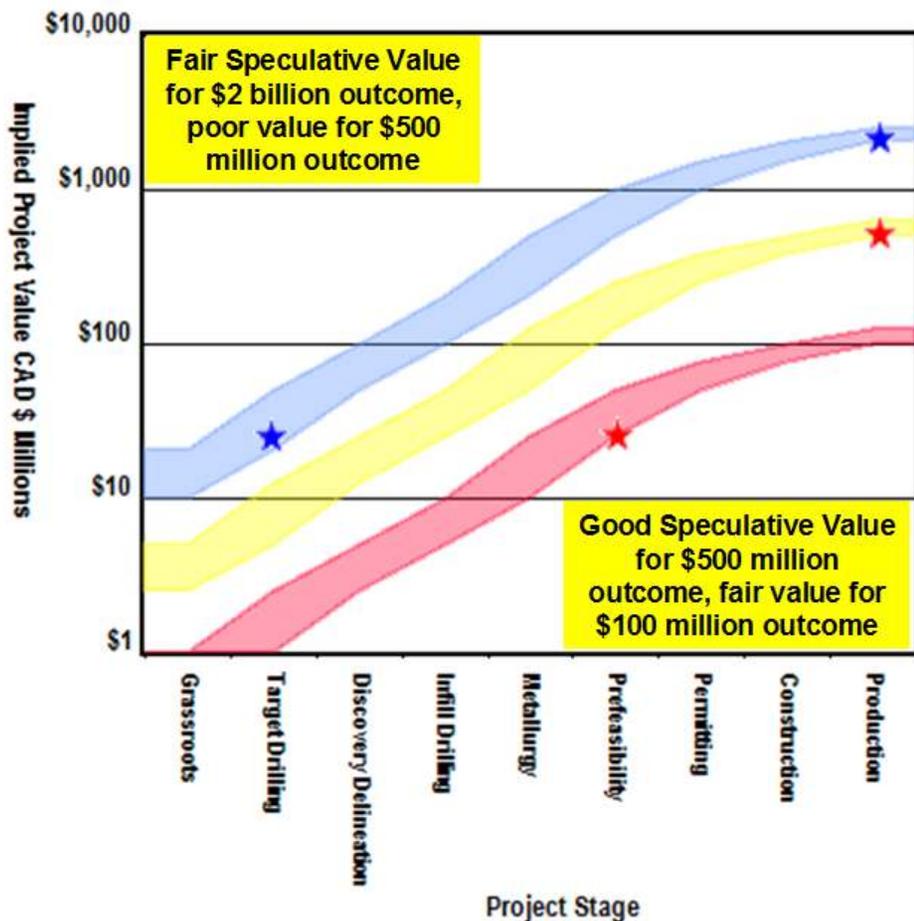
What we need to adjust for is the risk associated with the availability of information which is defined by the exploration stage.

## Rational Speculation Model – Uncertainty Ladder for Metal Projects

Exploration Cycle Stages		Success Probability		Outcome Target Fair Value Channels (\$ Millions)		
		Chance	Leverage	\$100	\$500	\$2,000
1	Grassroots	0.5-1%	100-200	<\$1	\$2.5-5	\$10-20
2	Target Drilling	1-2.5%	40-100	\$1-2.5	\$5-12.5	\$20-50
3	Discovery Delineation	2.5-5%	20-40	\$2.5-5	\$12.5-25	\$50-100
4	Infill Drilling	5-10%	10-20	\$5-10	\$25-50	\$100-200
5	PEA & Metallurgy	10-25%	4-10	\$10-25	\$50-125	\$200-500
6	Prefeasibility	25-50%	2-4	\$25-50	\$125-250	\$500-1,000
7	Permitting, Marketing & Feasibility	50-75%	1.3-2	\$50-75	\$250-375	\$1,000-1,500
8	Construction	75-100%	1	\$75-100	\$375-500	\$1,500-2,000
9	Production	100%		\$100	\$500	\$2,000

**Note:** the fair value range in each exploration stage row for each outcome target column is calculated by multiplying the target value by the success chance. ie stage 4 target \$500: 0.05 x \$500 = \$25, 0.1 x \$500 = \$50

## Mineral Exploration Cycle



The speculative value depends on the stage of the project, the value implied by the market, and the visualized outcome.

**Basic Gambling Principle = a fair bet is one where the payout matches the odds, a good bet is one where the payout is less than the odds, and a good bet, one you only find when the market is inefficient or rigged, is one where the payout greatly exceeds the underlying odds.**

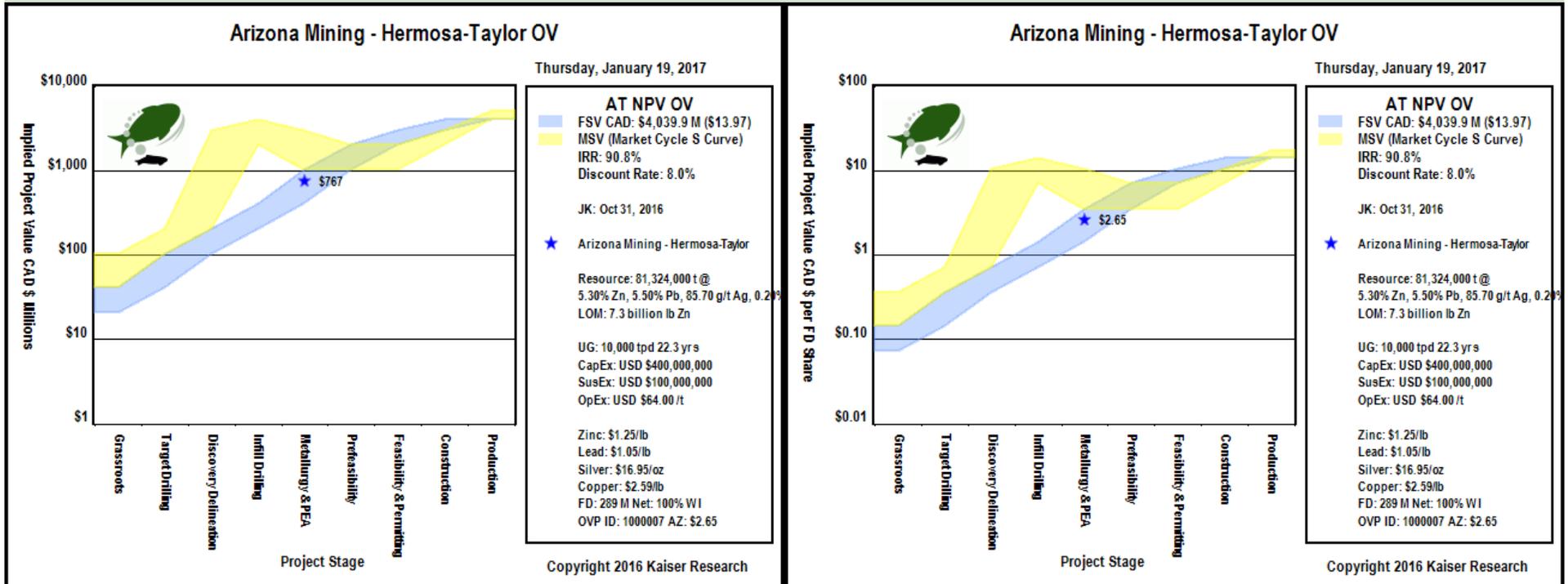
**Fair Speculative Value Stock Price Range: CAD \$1.40 - \$3.49**

**MSV (Market Cycle S Curve):** Market Speculative Value represents the typical market pricing pattern of a new discovery as it moves through its exploration-development cycle. The *irrational* pricing behavior of the yellow channel contrasts with the *fair speculative value* of the blue channel as defined by the *rational speculation model* because during the pre-economic study stages there is great uncertainty about how *big* the discovery will turn out.

**Fair Speculative Value Ladder**

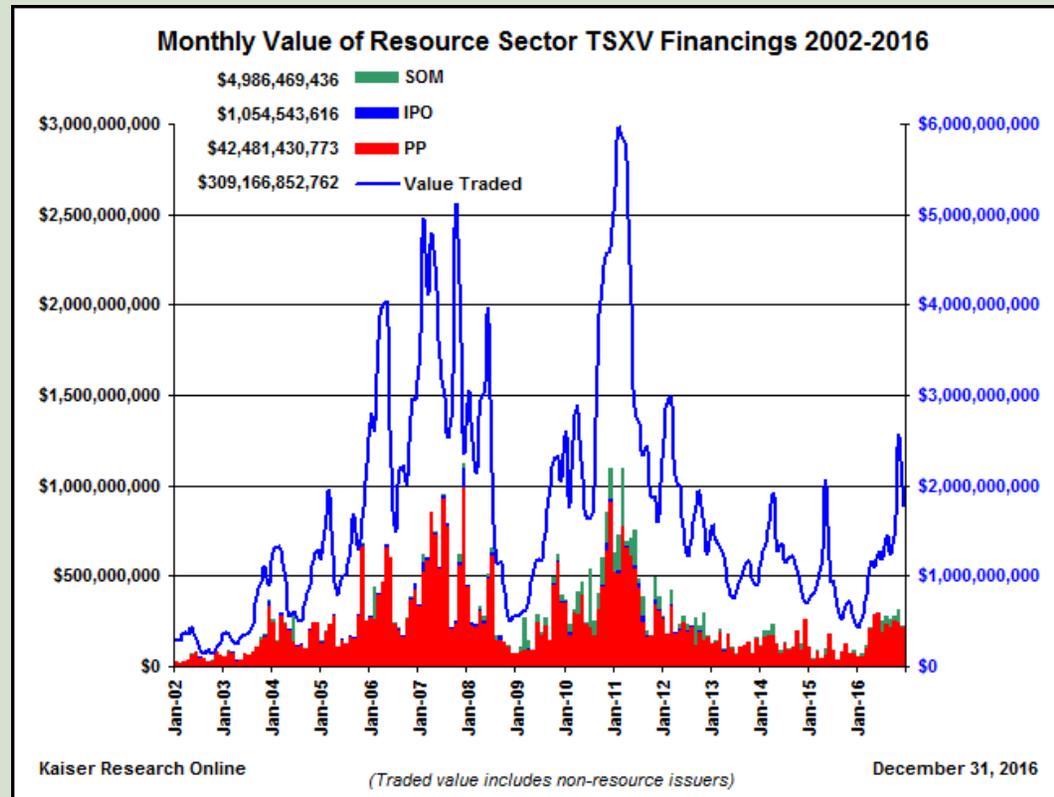
USD OV NPV	CAD OV NPV	Exch Rate	Diluted	Net Interest
<b>\$3,034,322,211</b>	<b>\$4,039,896,592</b>	<b>1.3314</b>	<b>289,279,031</b>	<b>100.00%</b>
Project Stage	Uncertainty Range	CAD FSV Range	CAD FSV per Share Range	CAD MSV per Share Range
Grassroots	0.5% - 1.0%	\$20,199,483 - \$40,398,966	\$0.07 - \$0.14	\$0.14 - \$0.35
Target Drilling	1.0% - 2.5%	\$40,398,966 - \$100,997,415	\$0.14 - \$0.35	\$0.35 - \$0.70
Discovery Delineation	2.5% - 5.0%	\$100,997,415 - \$201,994,830	\$0.35 - \$0.70	\$0.70 - \$10.47
Infill Drilling	5% - 10%	\$201,994,830 - \$403,989,659	\$0.70 - \$1.40	\$6.98 - \$13.97
<b>PEA &amp; Metallurgy</b>	<b>10% - 25%</b>	<b>\$403,989,659 - \$1,009,974,148</b>	<b>\$1.40 - \$3.49</b>	<b>\$3.49 - \$10.47</b>
Prefeasibility	25% - 50%	\$1,009,974,148 - \$2,019,948,296	\$3.49 - \$6.98	\$3.49 - \$6.98
Permitting & Feasibility	50% - 75%	\$2,019,948,296 - \$3,029,922,444	\$6.98 - \$10.47	\$3.49 - \$6.98
Construction	75% - 100%	\$3,029,922,444 - \$4,039,896,592	\$10.47 - \$13.97	\$6.98 - \$10.47
Production	100%	\$4,039,896,592	\$13.97	\$13.97 - \$17.46

## Rick Rule: “the intrinsic value of an exploration junior is zero”



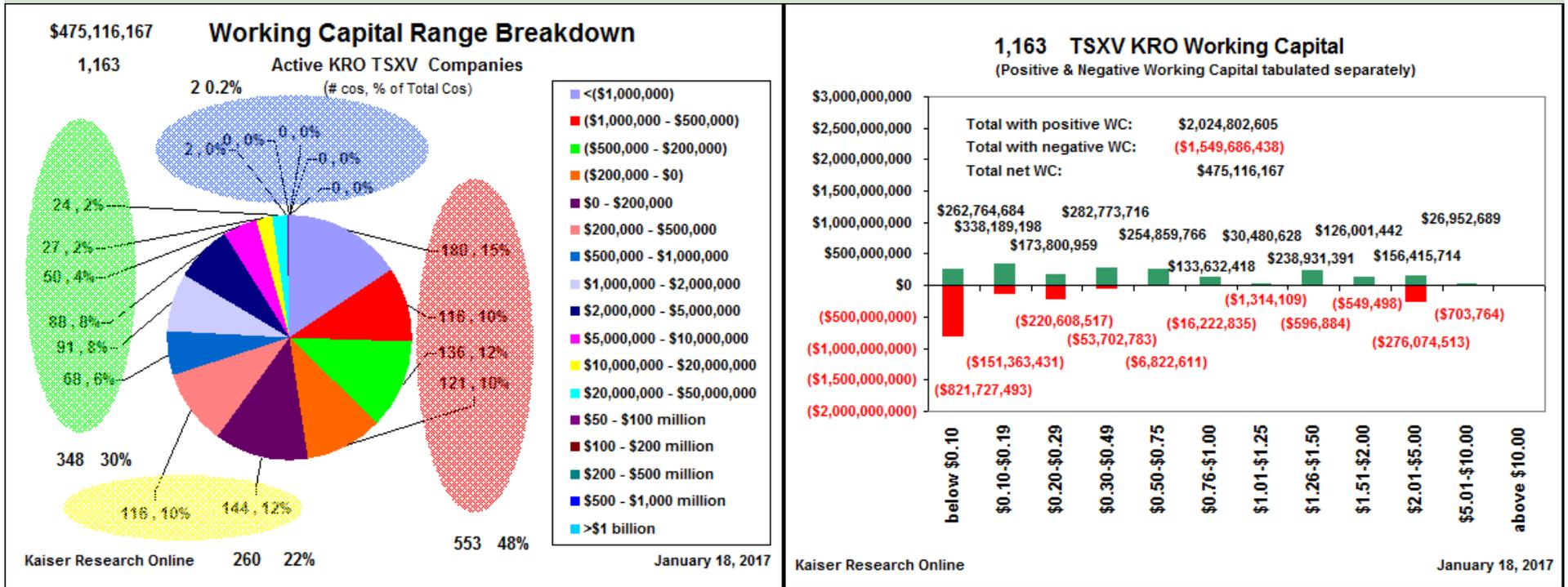
John Kaiser: “the speculative value of an exploration junior is the value of a plausible potential outcome times its uncertainty”

After a 5 year drought TSXV resource junior financing started to recover in 2016



But the capital is flowing into a minority of juniors

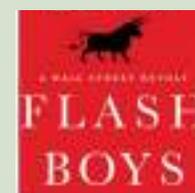
## The resource junior system is still unhealthy.



Half the juniors owe \$1.5 billion, 22% have enough to barely stay alive, and the remaining have \$2 billion to work with.

# A Broken Capital Market for Canadian Juniors

- **Client Relationship Model** – Suitability and the death of full service advice
- **Market failing as a Price Discovery Mechanism** – order book fragmentation, short-selling on a down-tick, computerized day trading
- **IIROC** – undermining market integrity with bias against upside volatility
- **Disclosure Overload & War on Forward Looking Statements** - junior market no longer works as a casino, a lost generation of investors who understand how to think about exploration plays
- **Choked Funding Gateways** – accredited investor restriction, insane paperwork, “existing shareholder” exemption inadequate
- **Domination by financial “cartels”** – loss of entrepreneurial independence, shrinkage of the sector into a small pool of juniors backed by conflicts of interest
- **Independent Advice** – is there still such a thing?



## Changes needed for a better resource junior capital market

- **CRM** – hopeless: resource junior investors must operate through zero-advice discount brokerages, companies must look outside brokerage firms unless their project is advanced enough for institutional capital
- **Choked Funding Gateways** – accredited investor restriction should be abolished, or “existing shareholder” requirement dropped, private placement paperwork digitized so crowd-funding portals can operate efficiently
- **Market failing as a Price Discovery Mechanism** – the market activity visuals need offsetting externalized fundamental outcome expectations
- **IIROC** – need to alter assumption that every market move without a press release is “insider trading” or “market manipulation”
- **Disclosure Overload** – need something to bridge the gaps between 43-101 events
- **Domination by financial “cartels”** – let the wisdom of crowds dictate who gets money so that merit rather than subservience determines who gets capital
- **Independent Advice** – enable crowd sourced “experts” to build reputation

## Requirements for a Solution

- **Valuation** – an online tool that makes it easy for investors to generate a LOM DCF based after-tax NPV using assumptions for what the potential fundamental outcome may look like
- **Risk Adjustment** – a model that adjusts the value of the imagined fundamental outcome to reflect the uncertainty associated with the project's exploration stage
- **Public Accessibility** – an online system for sharing a visualized outcome in a public space, presenting all the outcomes within a spectrum of bearish to bullish, and enabling all to see the underlying assumptions
- **Plausibility Determination Mechanism** – a crowd-based system whereby individuals can critique the plausibility of a visualized outcome's assumptions, and judge the credibility of such plausibility assessments
- **Fundamentals linked Audience Mood Capture** – enable the audience watching the activity of the visualizers to share their likes and dislikes in a public space
- **Reputation based Experts** – enable anonymous individuals to rise and fall as stars based solely through the reputation they evolve in the arena

**An Arena of anonymous Reputation based “Experts” – why would this not just be a gong show of manipulative garbage?**

**Because the disclaimer is very clear:**

**Every member who shares anything in the public space is assumed to have a conflict of interest and an agenda of influencing the market and the behavior of the crowd.**

**And, a key requirement:**

**All members of the Outcome Visualization Platform are anonymous and operate with a pseudonym – divulging one’s identity forfeits sharing privileges.**

## What Next?

I am currently involved in a startup that is developing an online version of the Outcome Visualization Platform. A prototype will be ready for testing in Q2 2017. Anybody interested in becoming a beta tester should contact me. A commercial release is planned for H2 of 2017.

- Geologists
- Engineers
- IR Representatives
- Students
- Fund Managers
- Retail Investors
- Company Executives
- Journalists
- Financial Professionals
- Regulators
- Traders
- Gamers
- Teachers
- Academics
- Government
- Lawyers
- Anybody who gets how cool this will be

**No public identity and credentials allowed!**

# Kaiser Research Online

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*When it takes a long time for a train to leave the station, it is because it is going a long way...*